Micro Hi-Fi System

MCM166

-/12/55/05/77

Service
Service
Service

This service manual is only for MCM166/12/55/05/77
This is previous generation models.

The serial number is:
before LM011039227020(only for/12)
before LM001039092086(only for /55/77)

Service Manual

CONTENTS

CLASS 1 LASER PRODUCT

Published by LX 1206 Service Audio Subject to modification

3141 785 33134

Version 1.4

PHILIPS

TECHNICAL SPECIFICATION

Amplifier

Rated Output Power	2X5W RMS
Frequency Response	60 - 16kHz, ±3dB
Signal to Noise Ratio	>65dB
Aux Input	0.5 V RMS 20kohm

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%
Frequency Response	60Hz -16kHz (44.1kHz)
S/N Ratio	>65dBA

Tuner

Tuning Range	FM: 87.5 - 108MHz; MW: 531 - 1602kHz
Tuning grid	50KHz
Sensitivity	
- Mono, 26dB S/N Ratio	<22 dBf
- Stereo, 46dB S/N Ratio	>43 dBf
Search Selectivity	>28dBf
Total Harmonic Distortion	<3%
Signal to Noise Ratio	>55dB

Speakers

Speaker Impedance	4ohm
Speaker Driver	3.5"woofer+0.8" tweeter
Sensitivity	>82dB/m/W

General information

AC power	220 - 230V, 50Hz
Operation Power Consumption	20W
Standby Power Consumption	<4W
Eco Standby Power Consumption	<2W
USB Direct	Version 2.0/1.1
Dimensions	
- Main Unit (W x H x D)	209 x231 x 147mm
- Speaker Box (W x H x D)	146 x 228 x 160mm
Weight	
- With Packing	6.6 kg
- Main Unit	1.95 kg
- Speaker Box	2 x 1.2 kg

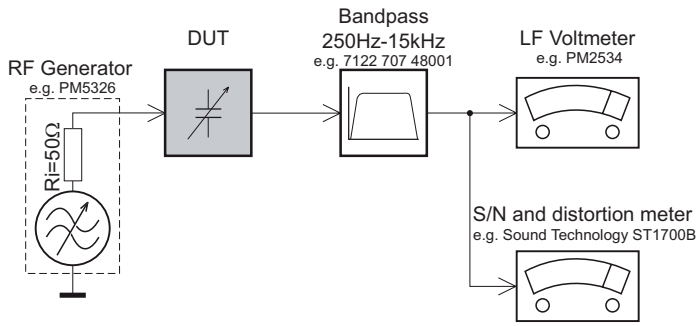
VERSION VARIATION

Type /Versions: / Service policy / Board in used:	MCM166(for first generation)									
	/05	/12		/55	/37	/61			/93	/98
MCU BOARD	C	C		C						
MAIN BOARD	C	C		C						
USB BOARD	C	C		C						
Type /Versions: / Features / Feature diffrence	MCM166(for first generation)									
	/05	/12		/55	/37	/61			/93	/98
RDS										
VOLTAGE SELECTOR										
ECO STANDBY - DARK	√	√								

* TIPS : C -- Component Lever Repair.
M -- Module Lever Repair
√ -- Used

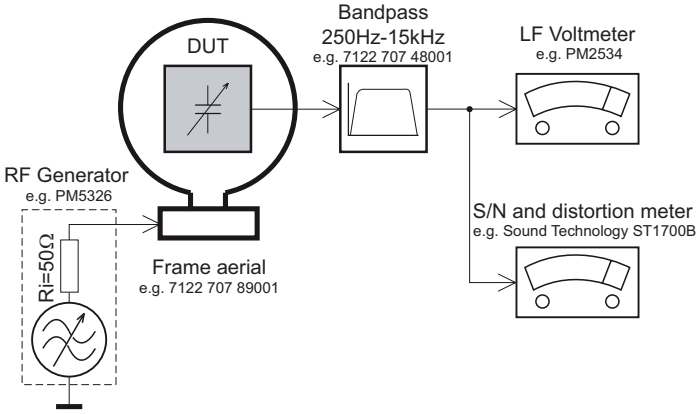
MEASUREMENT SETUP

Tuner FM



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

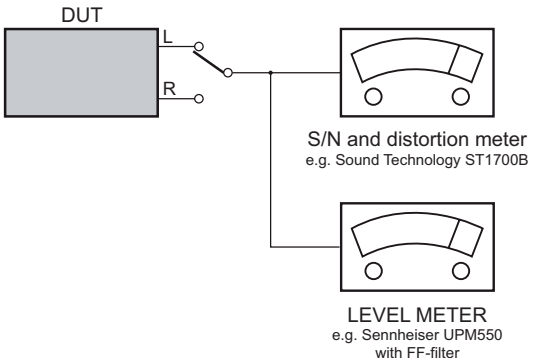
Tuner AM (MW,LW)



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).

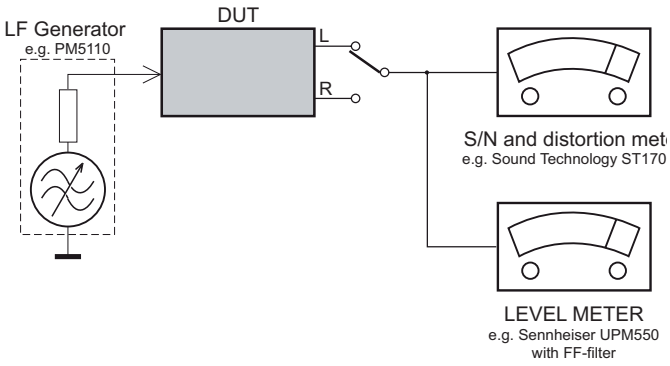
CD

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

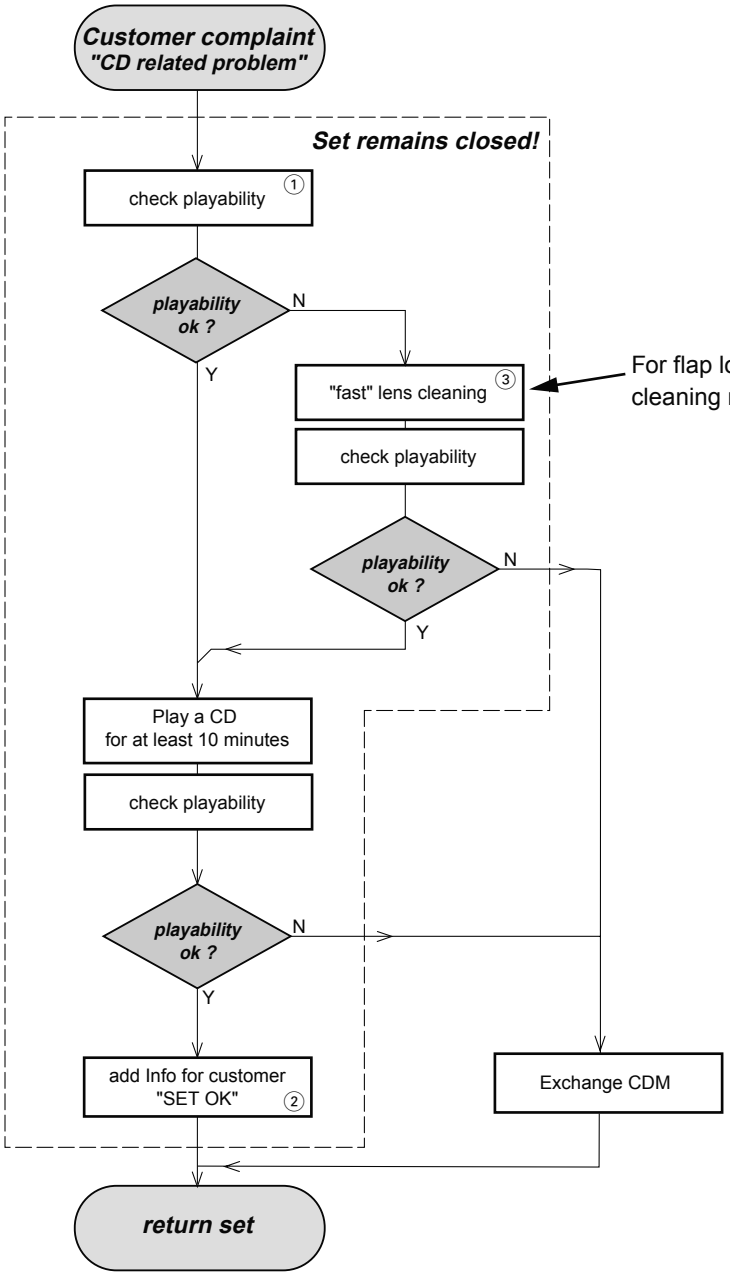
Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- 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

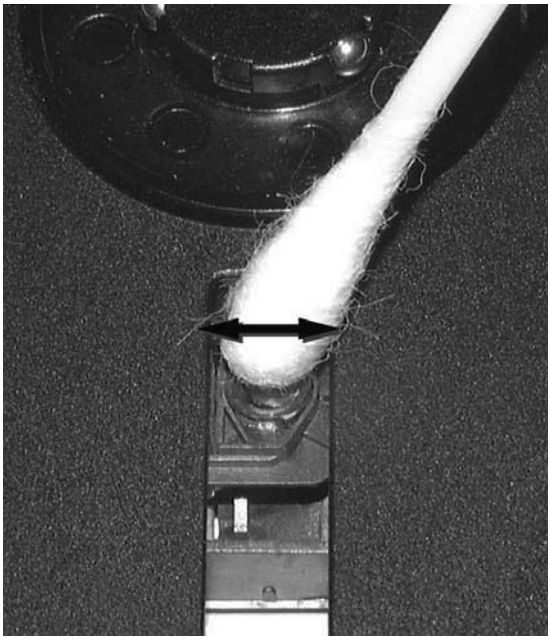
LIQUID LENS CLEANING

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.

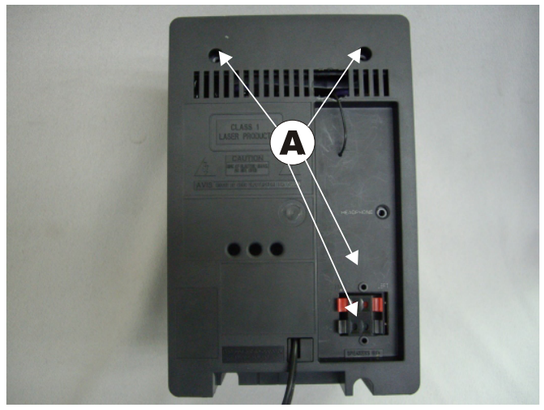


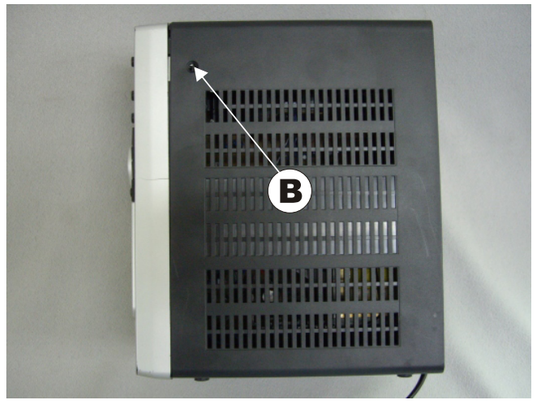
3 - 1

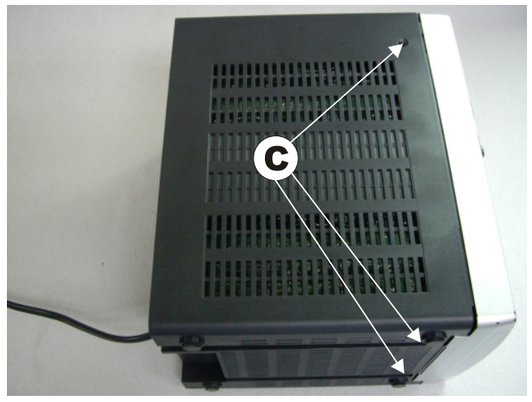
DISASSEMBLY DIAGRAM VIEW

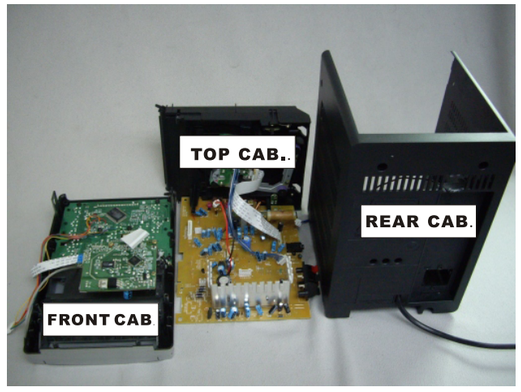
Dismantling of the Rear Cabinet

1）Remove 8 screws A&B&C as indicated to loosen the Rear Cabinet.







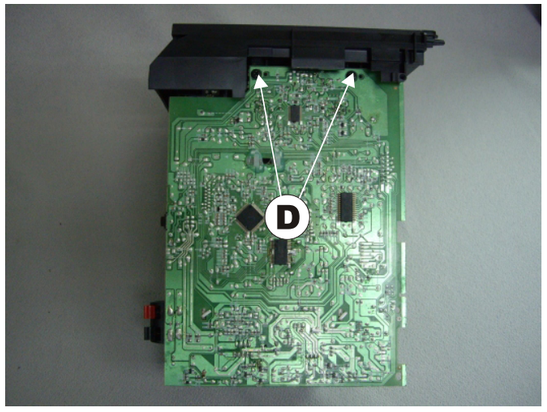


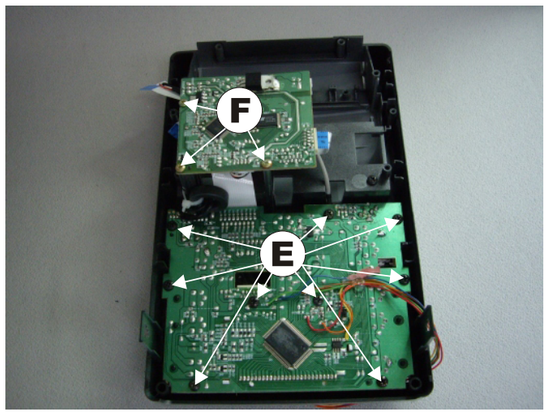
Dismantling of the PCB Board

1）Remove 2 screws D as indicated to loosen the Main Board.

2）Remove 9 screws E as indicated to loosen the Display Board.

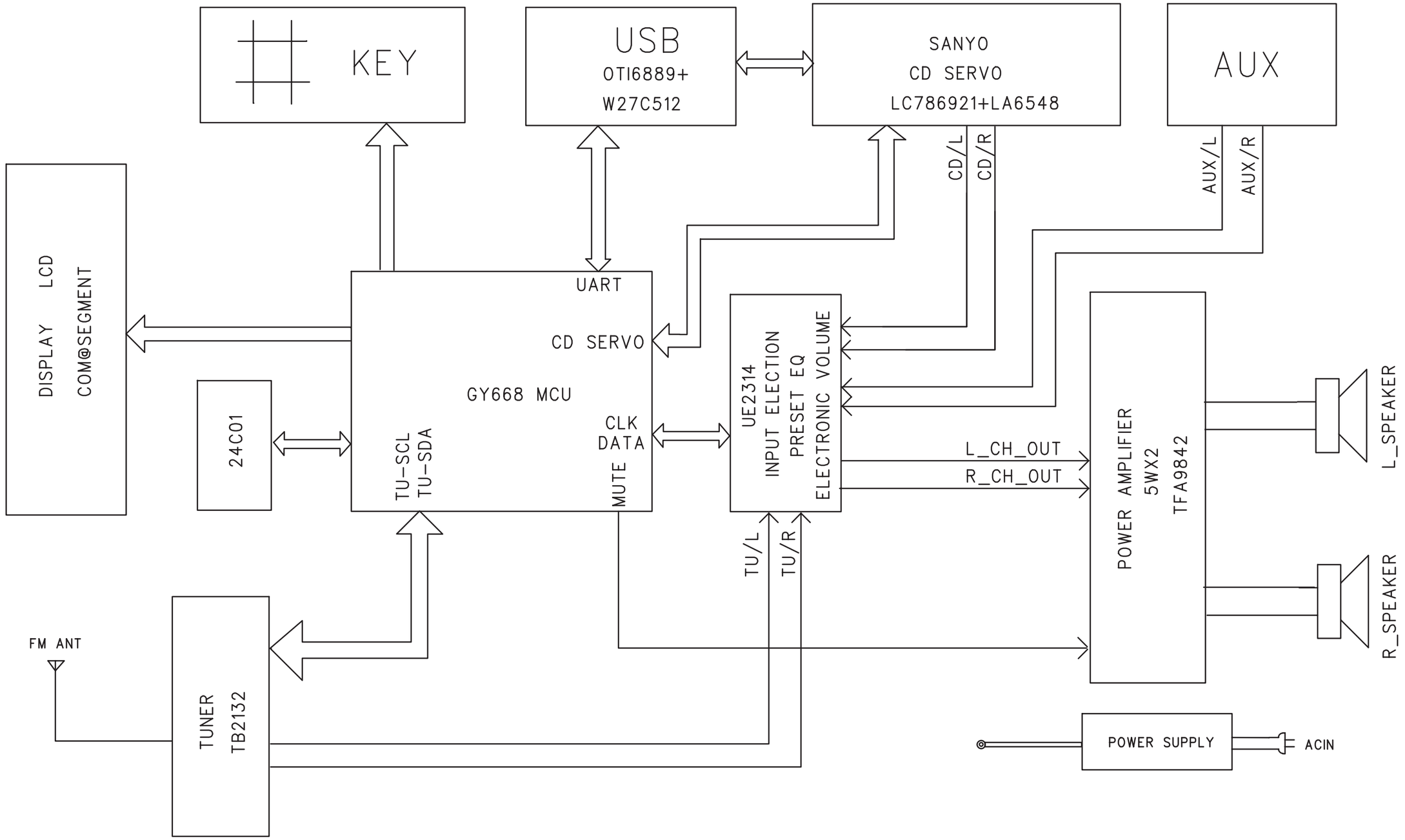
3）Remove 3 screws F as indicated to loosen the Usb Board.





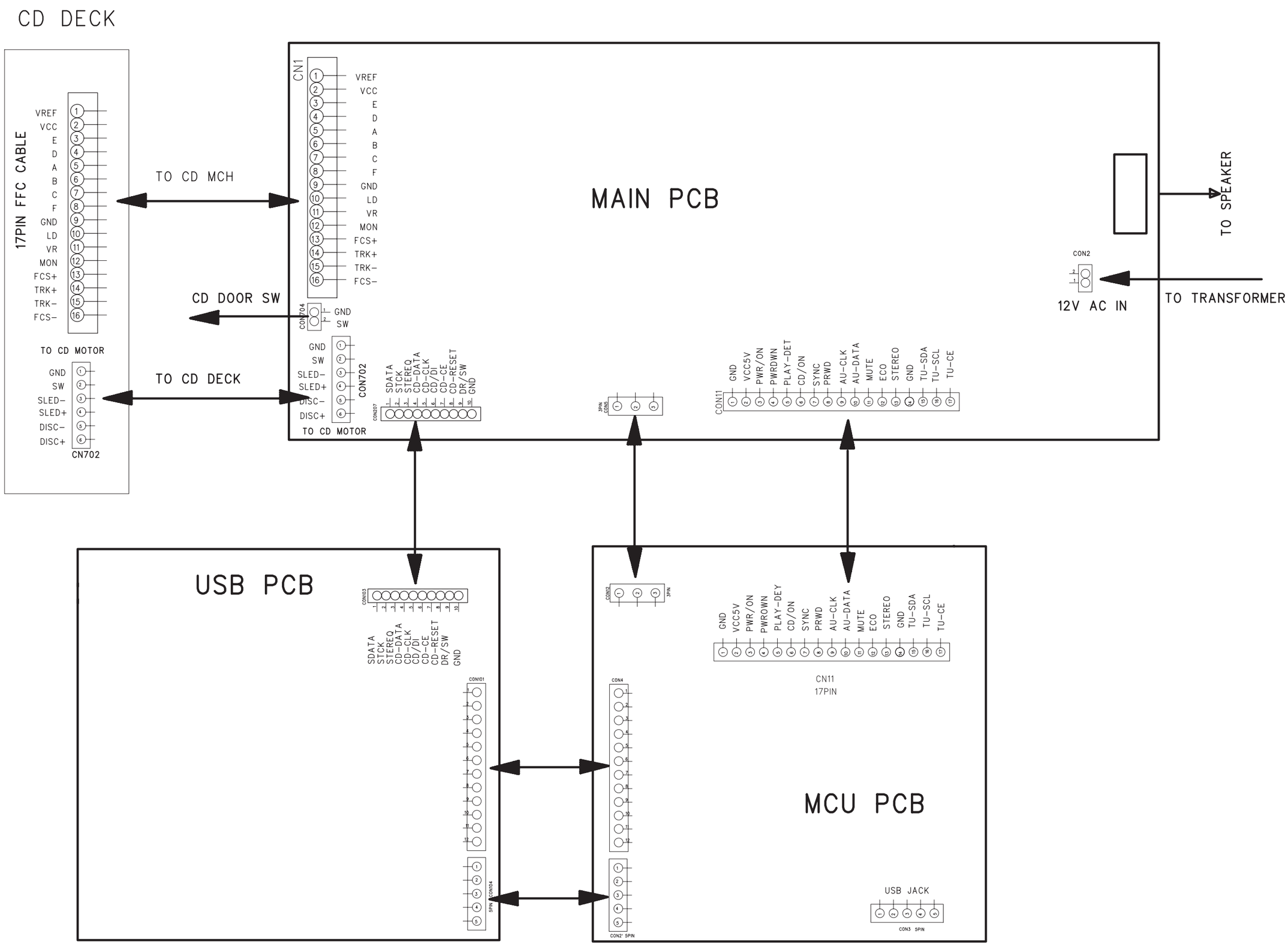
4 - 1

SET BLOCK DIAGRAM



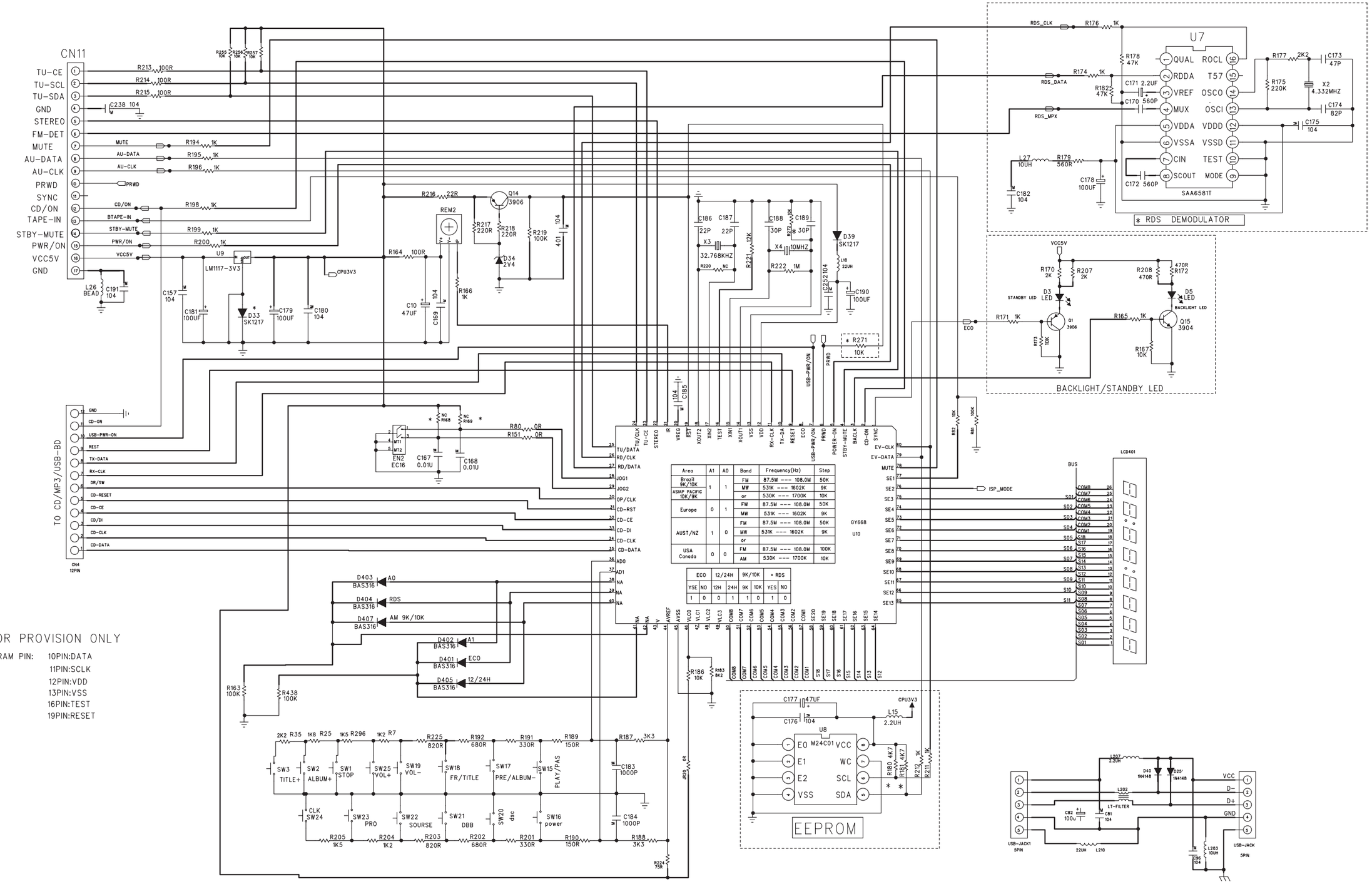
4- 2

SET WIRING DIAGRAM



5 - 1

CIRCUIT DIAGRAM - MCU BOARD



Area	A1	A0	Band	Frequency(Hz)	Step
Brazil 9K/10K	1	1	FM	87.5M --- 108.0M	50K
			MW	531K --- 1602K	9K
ASIAP PACIFIC 10K/9K			or	530K --- 1700K	10K
Europe	0	1	FM	87.5M --- 108.0M	50K
			MW	531K --- 1602K	9K
AUST/NZ	1	0	FM	87.5M --- 108.0M	50K
			MW	531K --- 1602K	9K
			or		
USA Canada	0	0	FM	87.5M --- 108.0M	100K
			AM	530K --- 1700K	10K

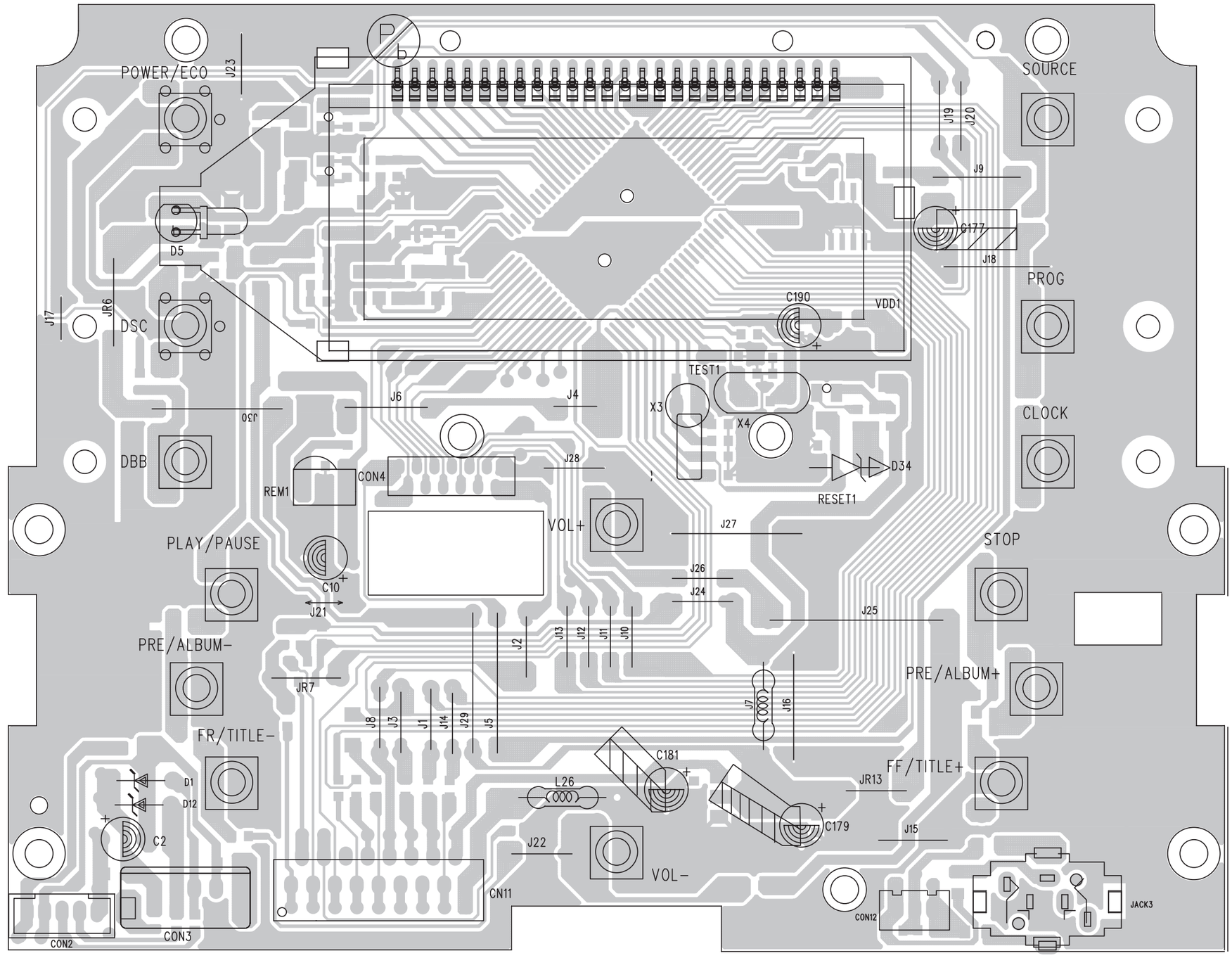
ECO	12/24H		9K/10K		• RDS	
YSE	NO	12H	24H	9K	10K	YES	NO
1	0	0	1	1	0	1	0

* FOR PROVISION ONLY

PROGRAM PIN: 10PIN:DATA
11PIN:SCLK
12PIN:VDD
13PIN:VSS
16PIN:TEST
19PIN:RESET

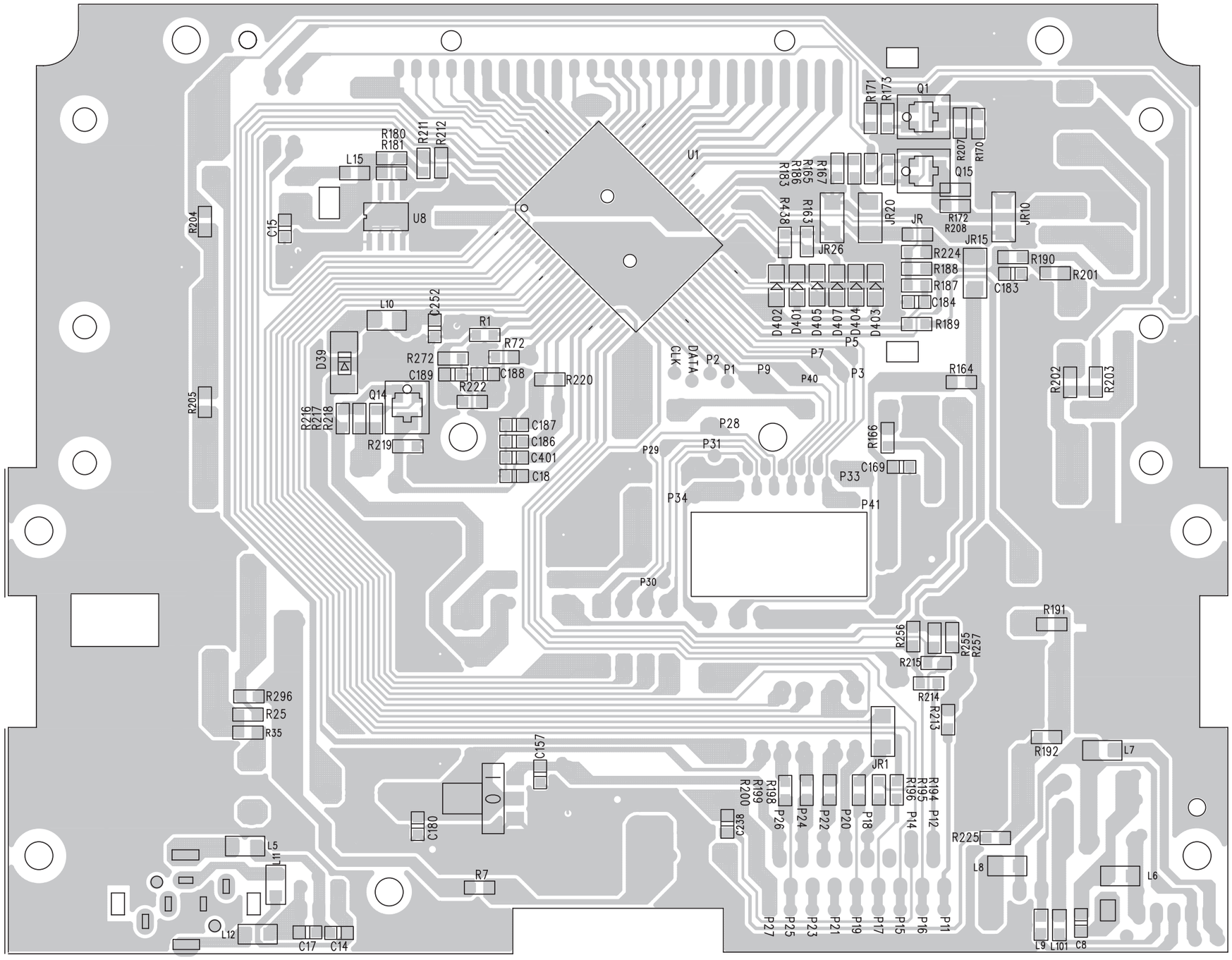
5 - 2

LAYOUT DIAGARM - MCU BOARD
COMPONENT SIDE VIEW



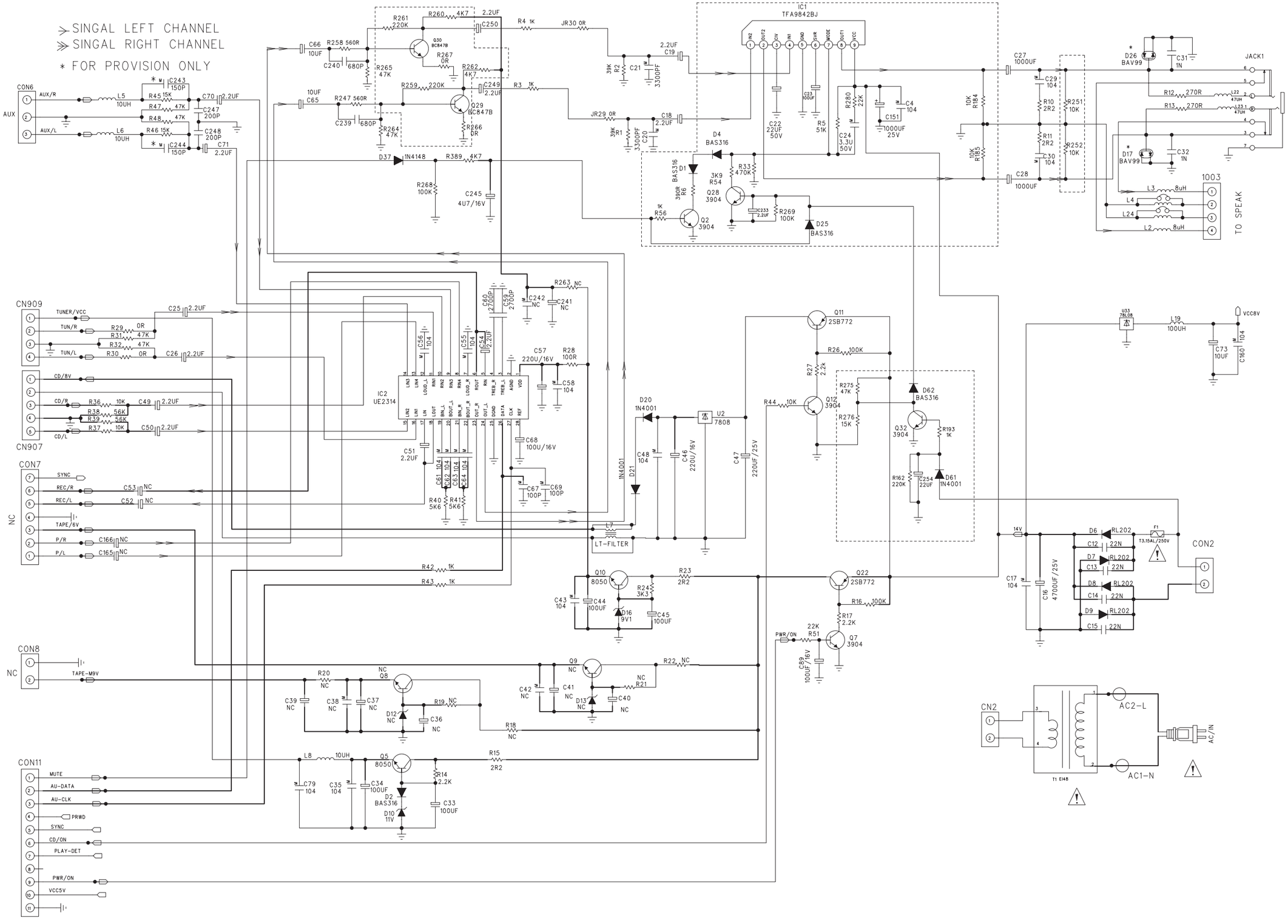
5 - 3

LAYOUT DIAGARM - MCU BOARD
COPPER SIDE VIEW



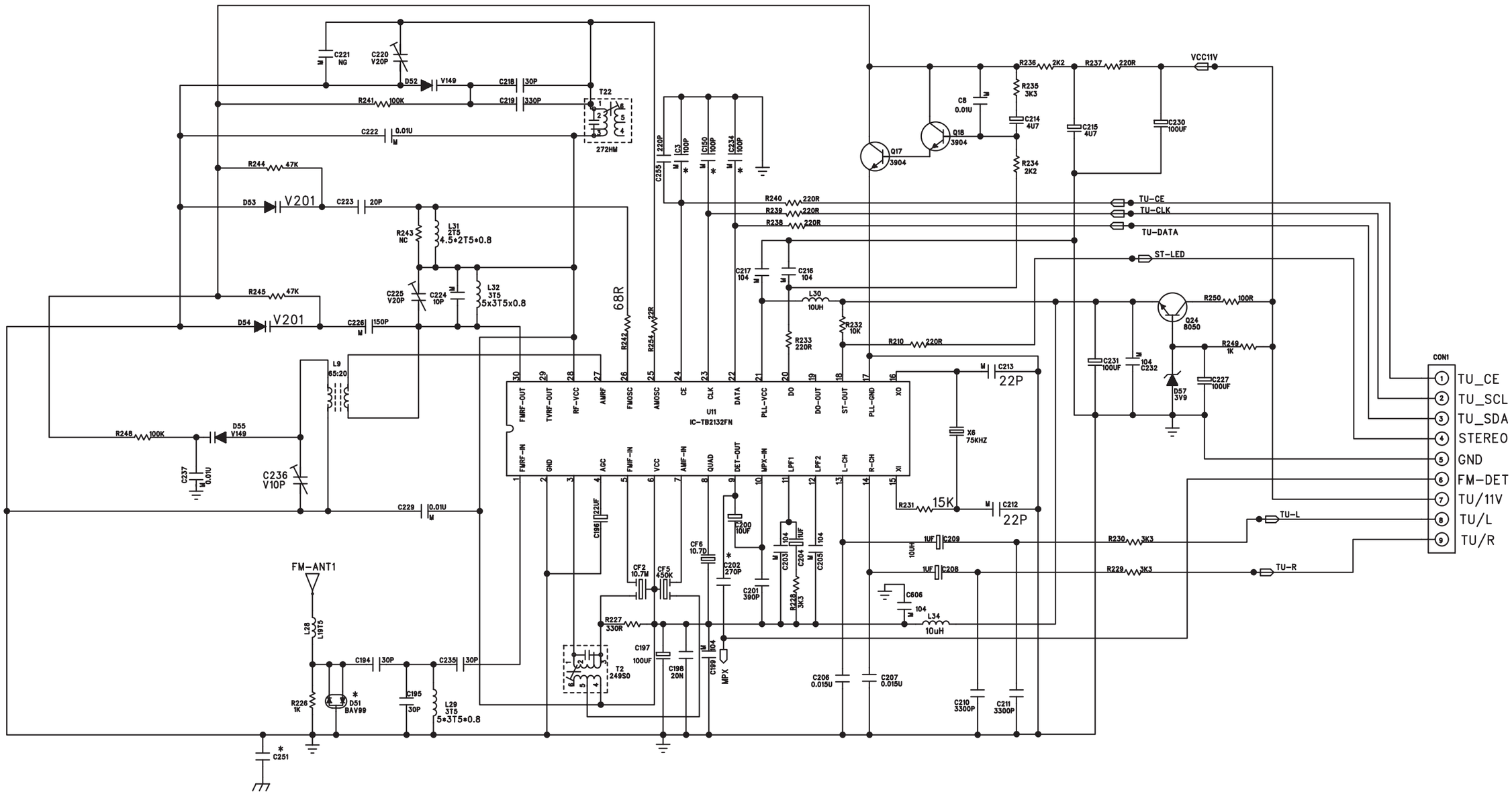
6 - 1

CIRCUIT DIAGRAM - MAIN BOARD
AF & AMP PART



6 - 2

CIRCUIT DIAGRAM - MAIN BOARD
TUNER PART



6 - 3

CIRCUIT DIAGRAM - MAIN BOARD
CD PART

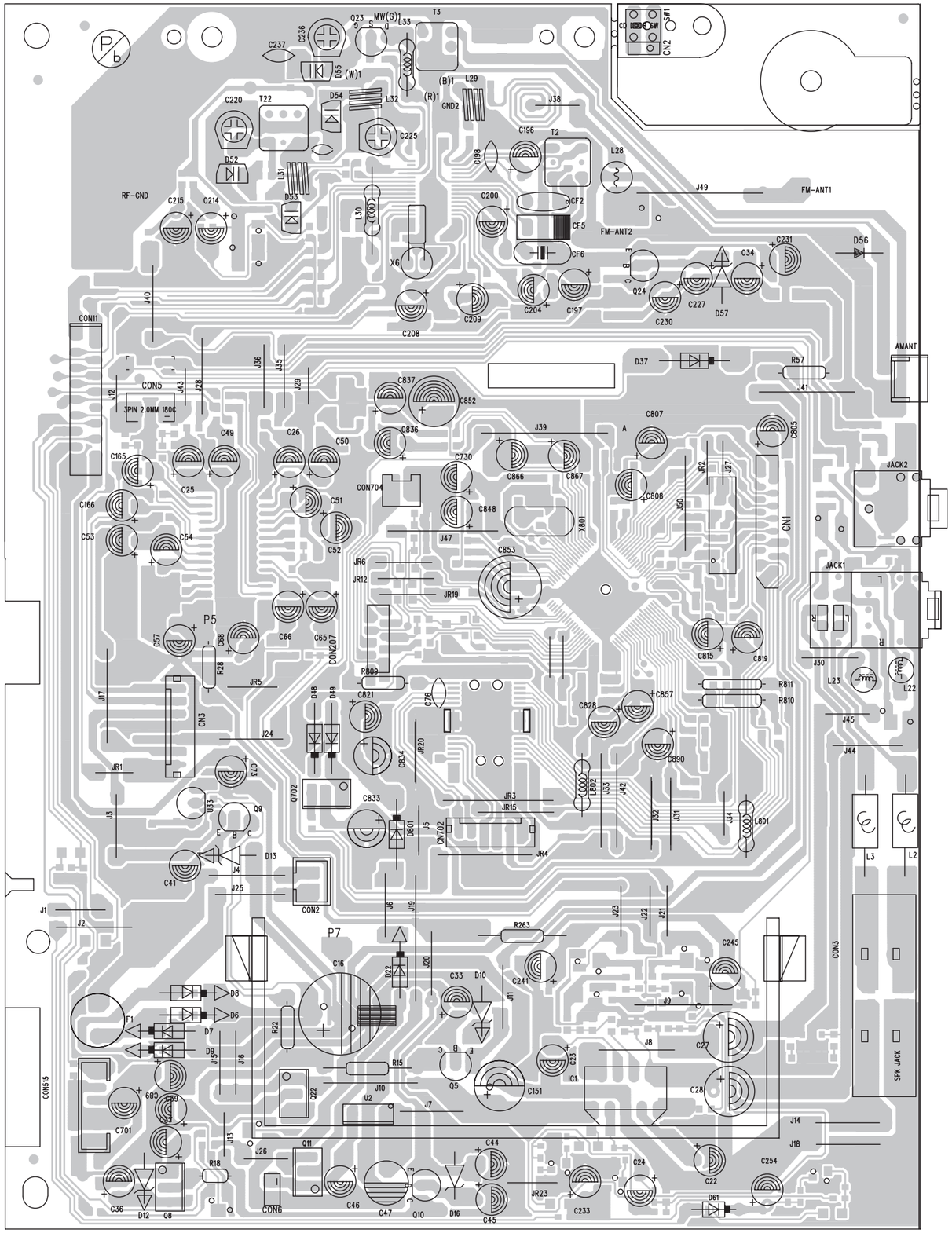
	NO USB (Default)	USB Stream
CN805	open	PH-4P
R843	0R	OPEN
R844	0R	OPEN
R845	0R	OPEN
R847	open	0R
R848	open	0R
R849	open	0R

R866 ADD 12K

R853 100K CHANGE TO 12K

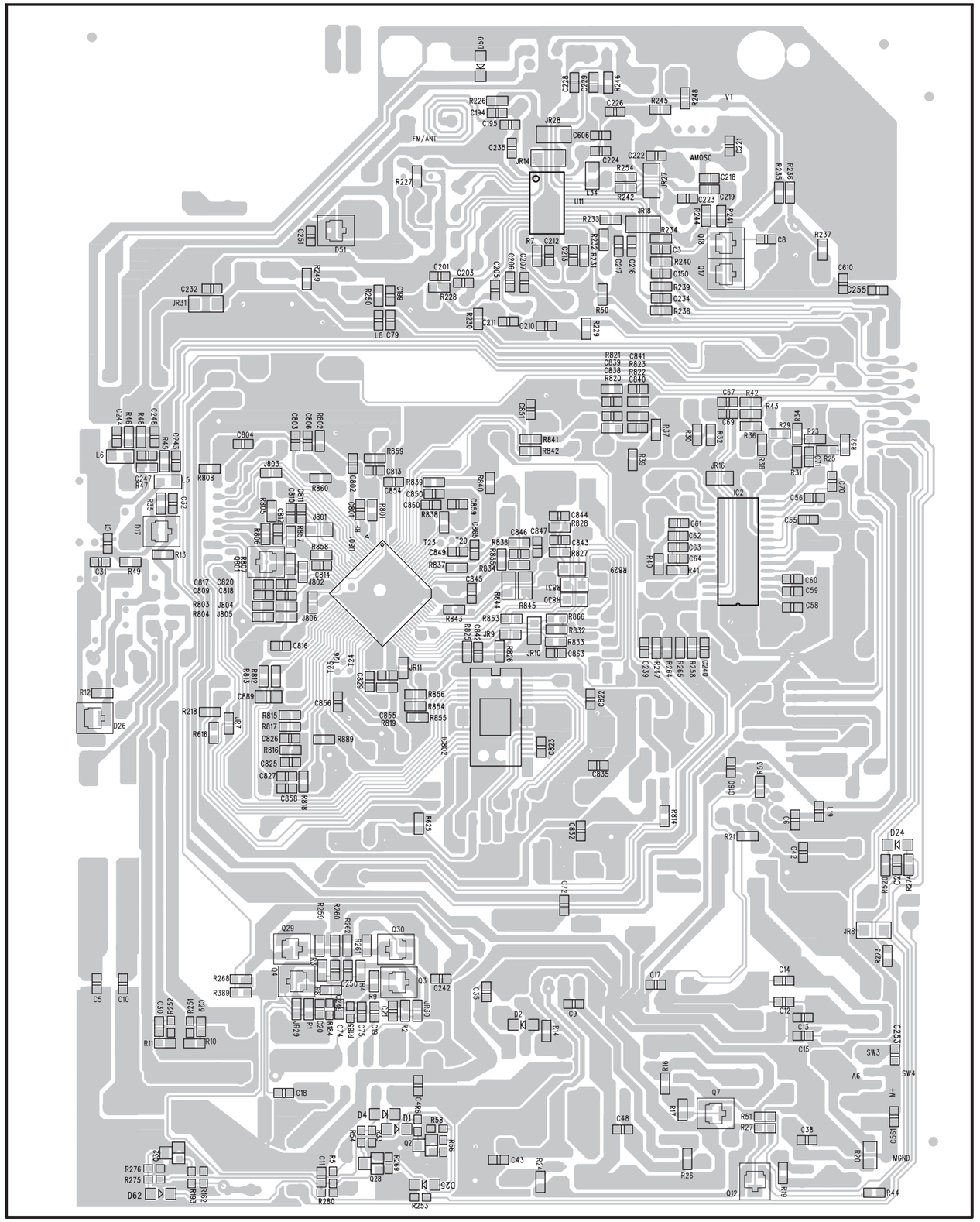
6 - 4

LAYOUT DIAGARM - MAIN BOARD
COMPONENT SIDE VIEW



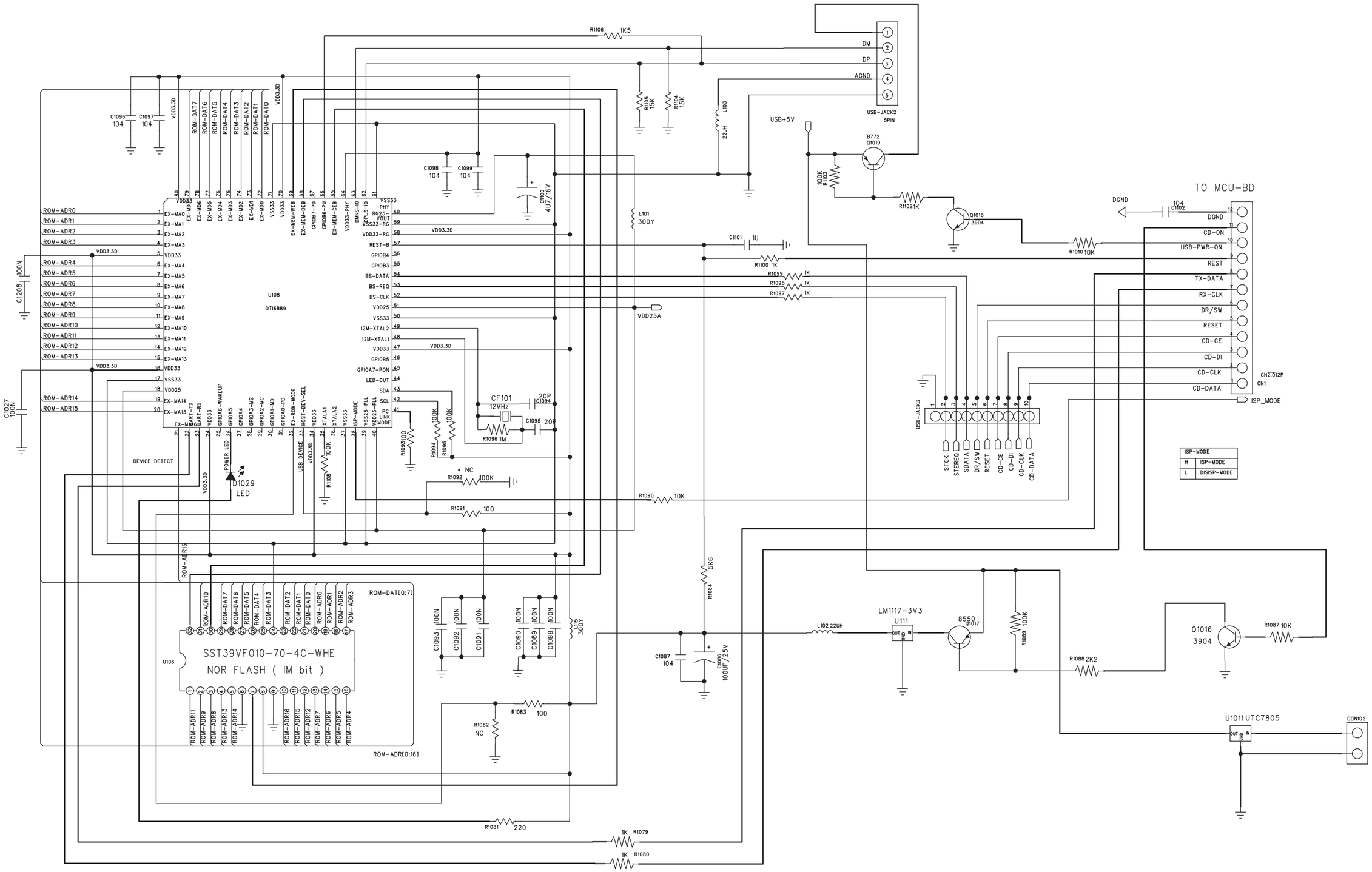
6 - 5

LAYOUT DIAGARM - MAIN BOARD
COPPER SIDE VIEW



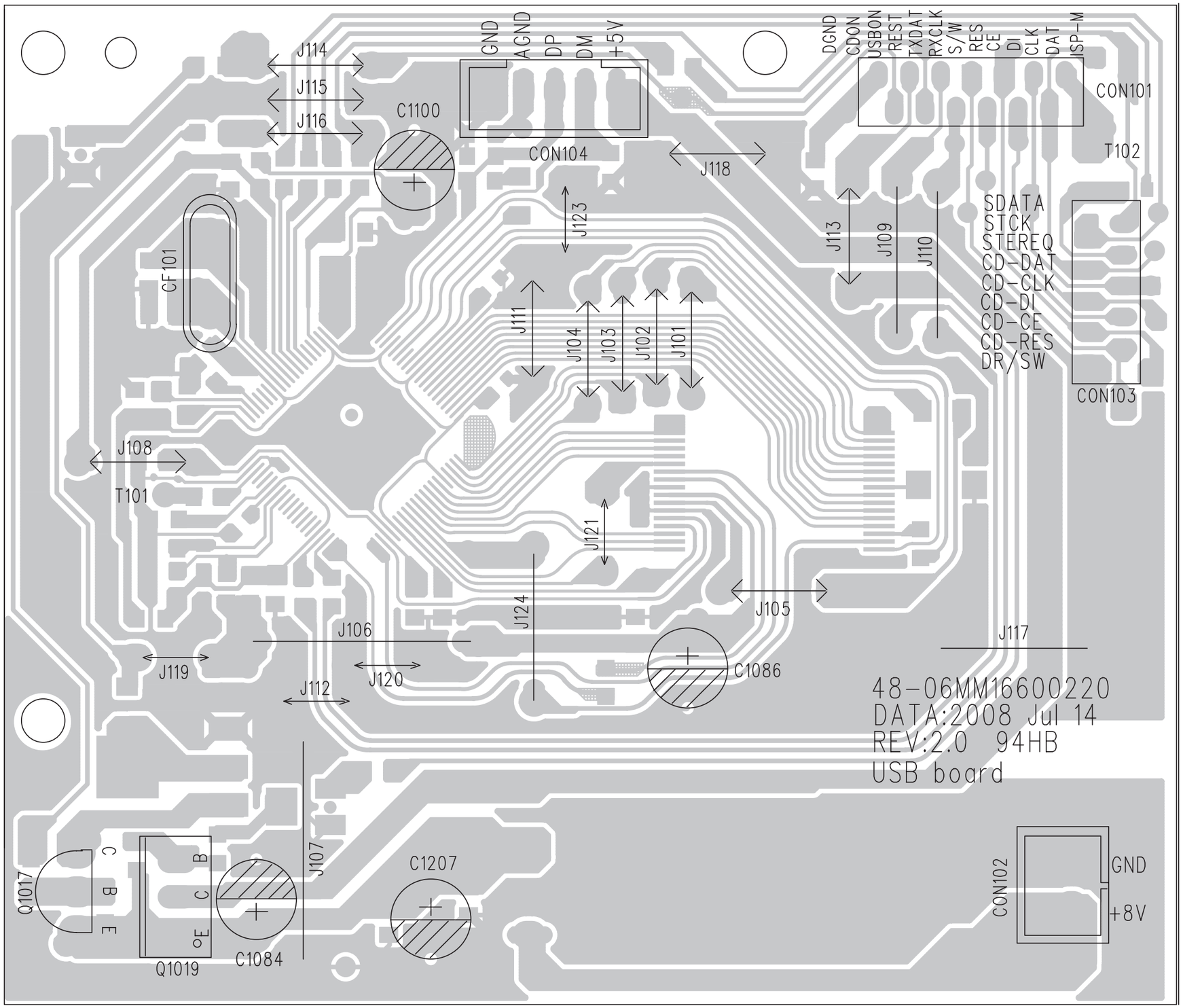
7 - 1

CIRCUIT DIAGRAM - USB BOARD



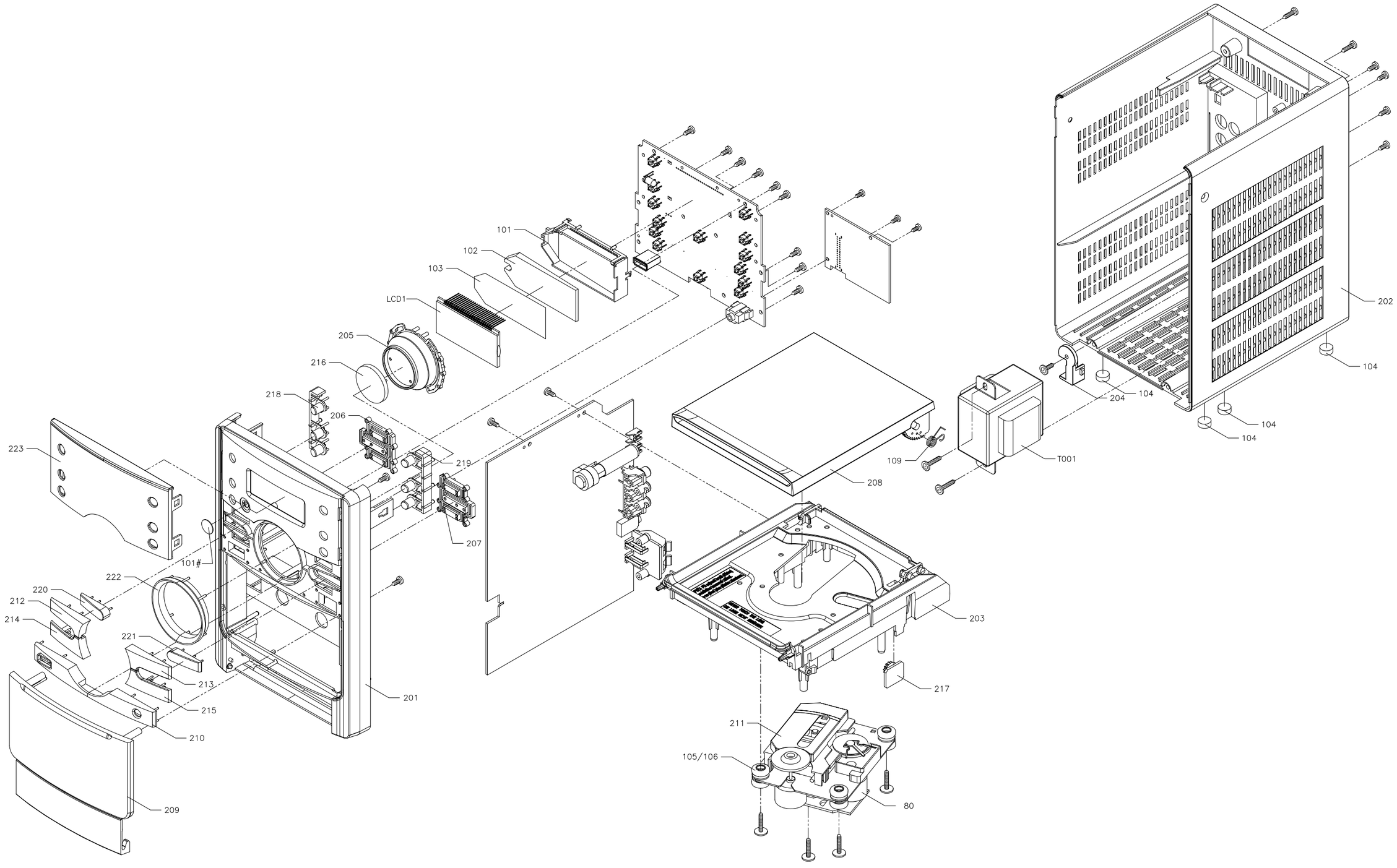
7 - 2

LAYOUT DIAGRAM - USB BOARD



8 - 1

EXPLODED VIEW DIAGRAM



Micro Hi-Fi System

MCM166

-/12/55/ 77

Service
Service
Service

This service manual is only for MCM166/12/55/77
This is 3rd generation models.
The serial number begins with:
LM011132315450 or LM021133318950(only for/12)
LM00113216591(only for /55)
LM1B1136014413(only for /77)

Service Manual

CONTENTS

CLASS 1 LASER PRODUCT

Published by LX 1206 Service Audio Subject to modification

3141 785 33134

Version 1.4

PHILIPS

TECHNICAL SPECIFICATION

Amplifier

Rated Output Power	2X5W RMS
Frequency Response	60 - 16kHz, ±3dB
Signal to Noise Ratio	>65dB
Aux Input	0.5 V RMS 20kohm

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%
Frequency Response	60Hz -16kHz (44.1kHz)
S/N Ratio	>65dBA

Tuner

Tuning Range	FM: 87.5 - 108MHz; MW: 531 - 1602kHz
Tuning grid	50KHz
Sensitivity	
- Mono, 26dB S/N Ratio	<22 dBf
- Stereo, 46dB S/N Ratio	>43 dBf
Search Selectivity	>28dBf
Total Harmonic Distortion	<3%
Signal to Noise Ratio	>55dB

Speakers

Speaker Impedance	4ohm
Speaker Driver	3.5"woofer+0.8" tweeter
Sensitivity	>82dB/m/W

General information

AC power	220 - 230V, 50Hz
Operation Power Consumption	20W
Standby Power Consumption	<4W
Eco Standby Power Consumption	<2W
USB Direct	Version 2.0/1.1
Dimensions	
- Main Unit (W x H x D)	209 x231 x 147mm
- Speaker Box (W x H x D)	146 x 228 x 160mm
Weight	
- With Packing	6.6 kg
- Main Unit	1.95 kg
- Speaker Box	2 x 1.2 kg

VERSION VARIATION

Type /Versions: / Service policy / Board in used:	MCM166(3rd generation)									
	/05	/12		/55	/37	/61			/93	/98
DISPLAY BOARD		C								
MAIN BOARD		C								
Type /Versions: / Feature diffrence / Features	MCM166 (3rd generation)									
	/05	/12		/55	/37	/61			/93	/98
RDS										
VOLTAGE SELECTOR										
ECO STANDBY - DARK	√	√								

* TIPS : C -- Component Lever Repair.
M -- Module Lever Repair
√ -- Used

2.0 SAFTETY INSTRUCTIONS

(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

(NL) WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

(F) ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

(D) WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

(I) AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

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

(NL)
Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

(D)
Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

(I)
Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA."

"Pour votre sécurité, ces documents doivent être utilisés par des spécialistes agréés, seuls habilités à réparer votre appareil en panne".

CLASS 1
LASER PRODUCT
3122 110 03420

(GB) Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

(S) Varning !

Osynlig laserstrålning när apparaten är öppnad och spärren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

DK Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

Caution: These servicing instructions are for use by qualified service personnel only.
To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

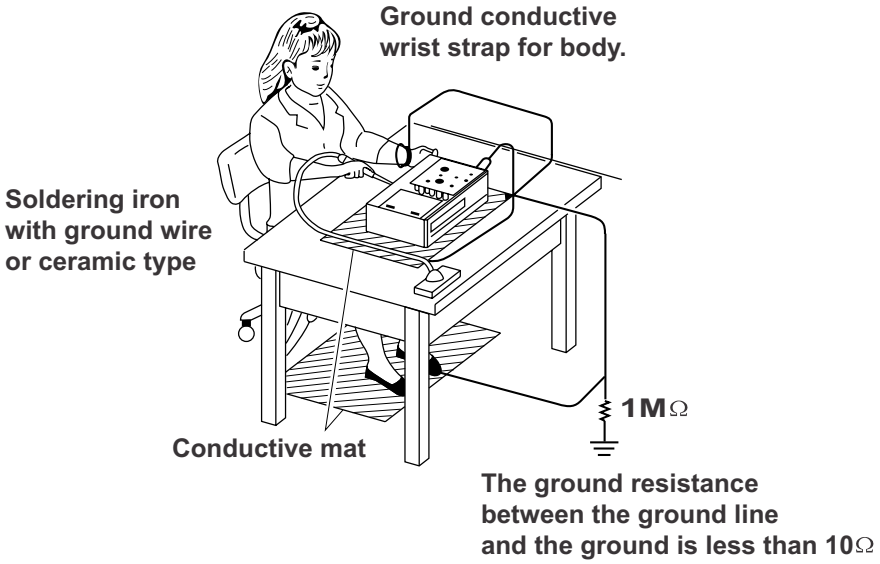
2.1 ESD PROTECTION

- レンズには絶対に触れないでください。
- DO NOT TOUCH THE LENS.
- LINSE NICHT BRÜHREN.
- NE PAS TOUCHER LA LENTILLE.

When the power supply is being turned on, you may not remove this laser cautions label. If it removes, radiation of laser may be received.

PREPARATION OF SERVICING

Pickup Head consists of a laser diode that is very susceptible to external static electrocity.
Although it operates properly after replacement, if it was subject to electrostatic discharge during replacement, its life might be shortened. When replacing, use a conductive mat, soldering iron with ground wire,etc. to protect the laser diode form damage by static electricity.
And also, the LSI and IC are same as above.



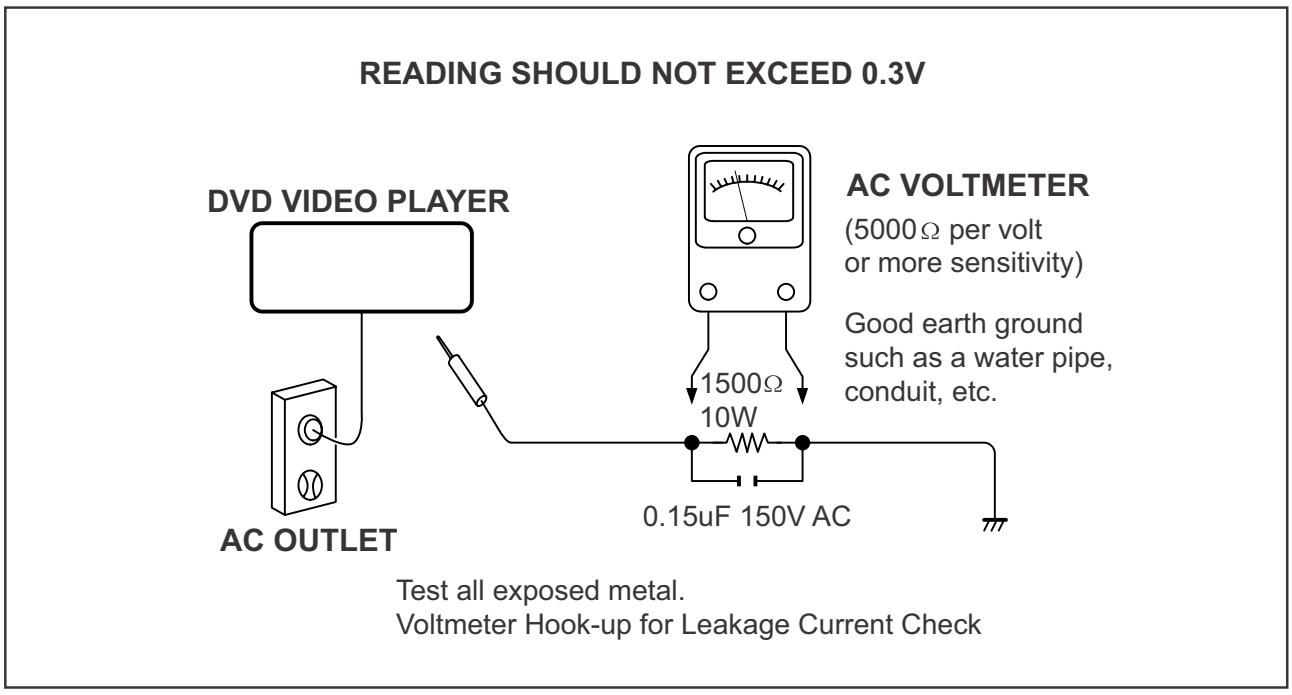
SAFTY NOTICE

SAFTY PRECAUTIONS

LEAKAGE CURRENT CHECK

Plug the AC line cord directly into a 120V AC outlet (do not use an isolation transformer for this check). Use an AC voltmeter, having 5000Ω per volt or more sensitivity. Connect a 1500Ω 10W resistor,paralleled by a 0.15uF 150V AC capacitor between a knomn good earth ground (water pipe, conduit, etc.) and all exposed metal parts of cabinet (antennas, handle bracket, metal cabinet screwheads, metal overlays, control shafts, etc.).

Measure the AC voltage across the 1500Ω resistor. The test must be conducted with the AC switch on and then repeated with the AC switch off. The AC voltage indicated by the meter may not exceed 0.3V.A reading exceeding 0.3V indicates that a dangerous potential exists, the fault must be located and corrected. Repeat the above test with the DVD VIDEO PLAYER power plug reversed.
NEVER RETURN A DVD VIDEO PLAYER TO THE CUSTOMER WITHOUT TAKING NECESSARY CORRECTIVE ACTION.



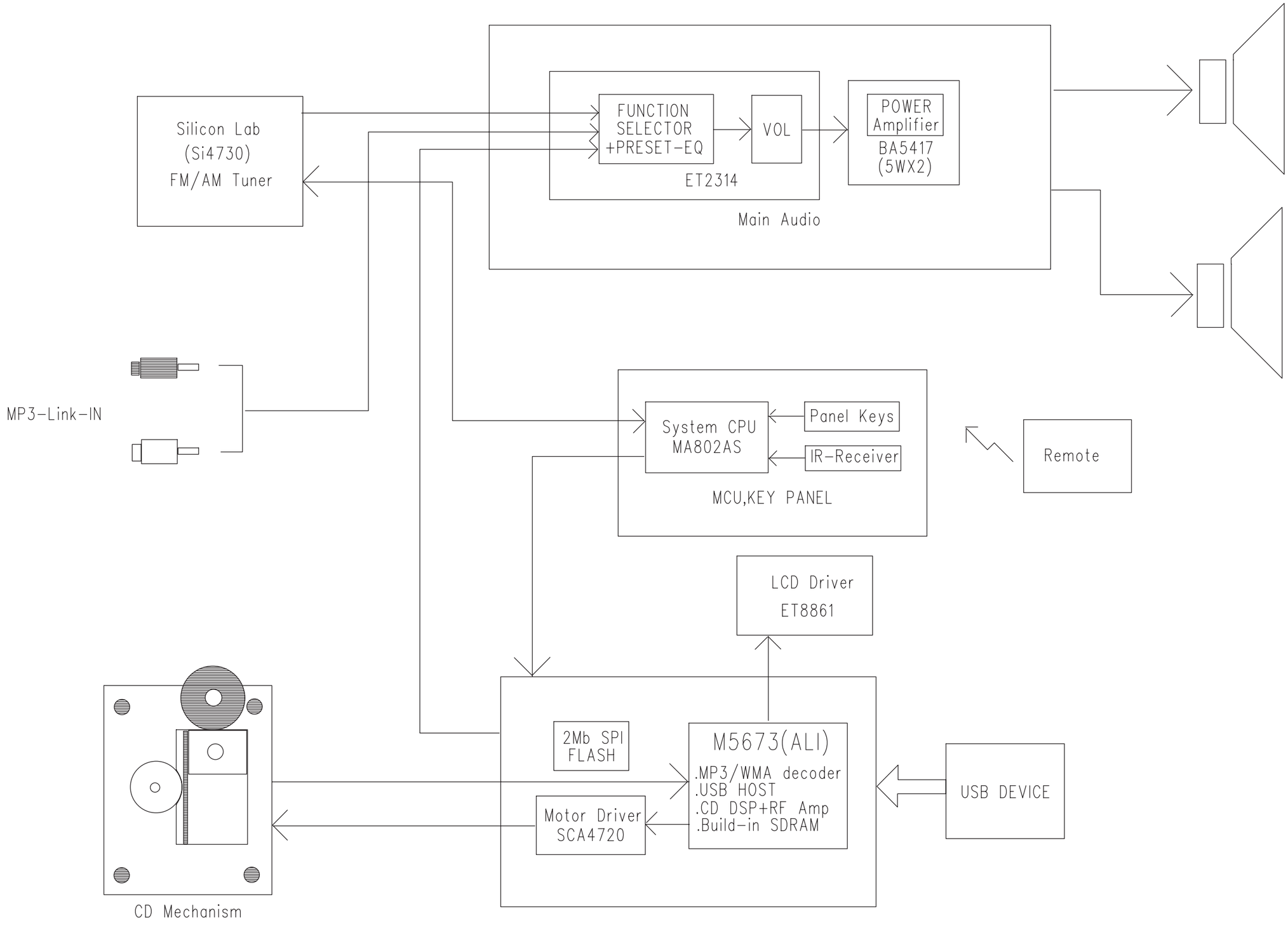
Test all exposed metal.
Voltmeter Hook-up for Leakage Current Check

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

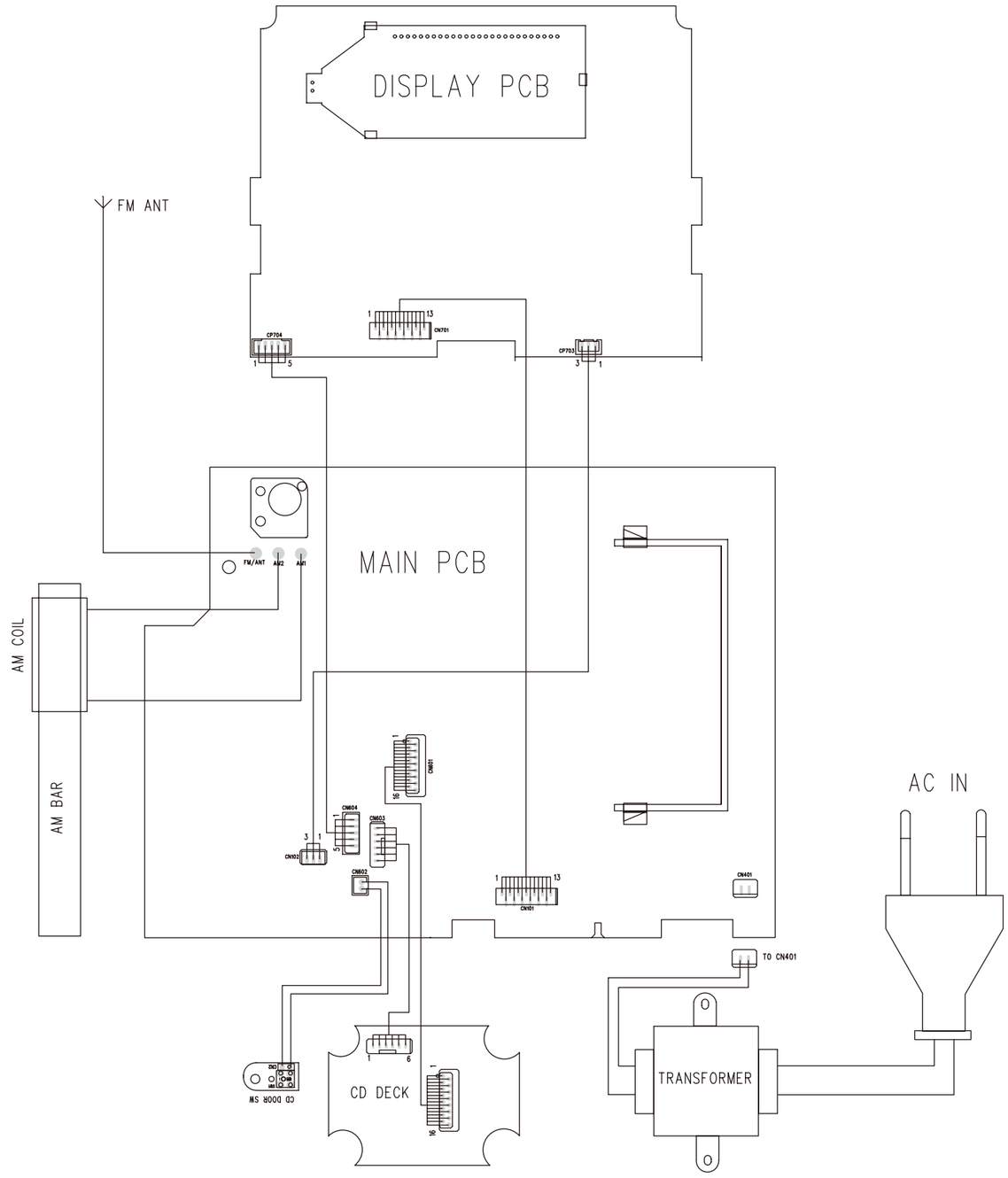
3-1

BLOCK DIAGRAM



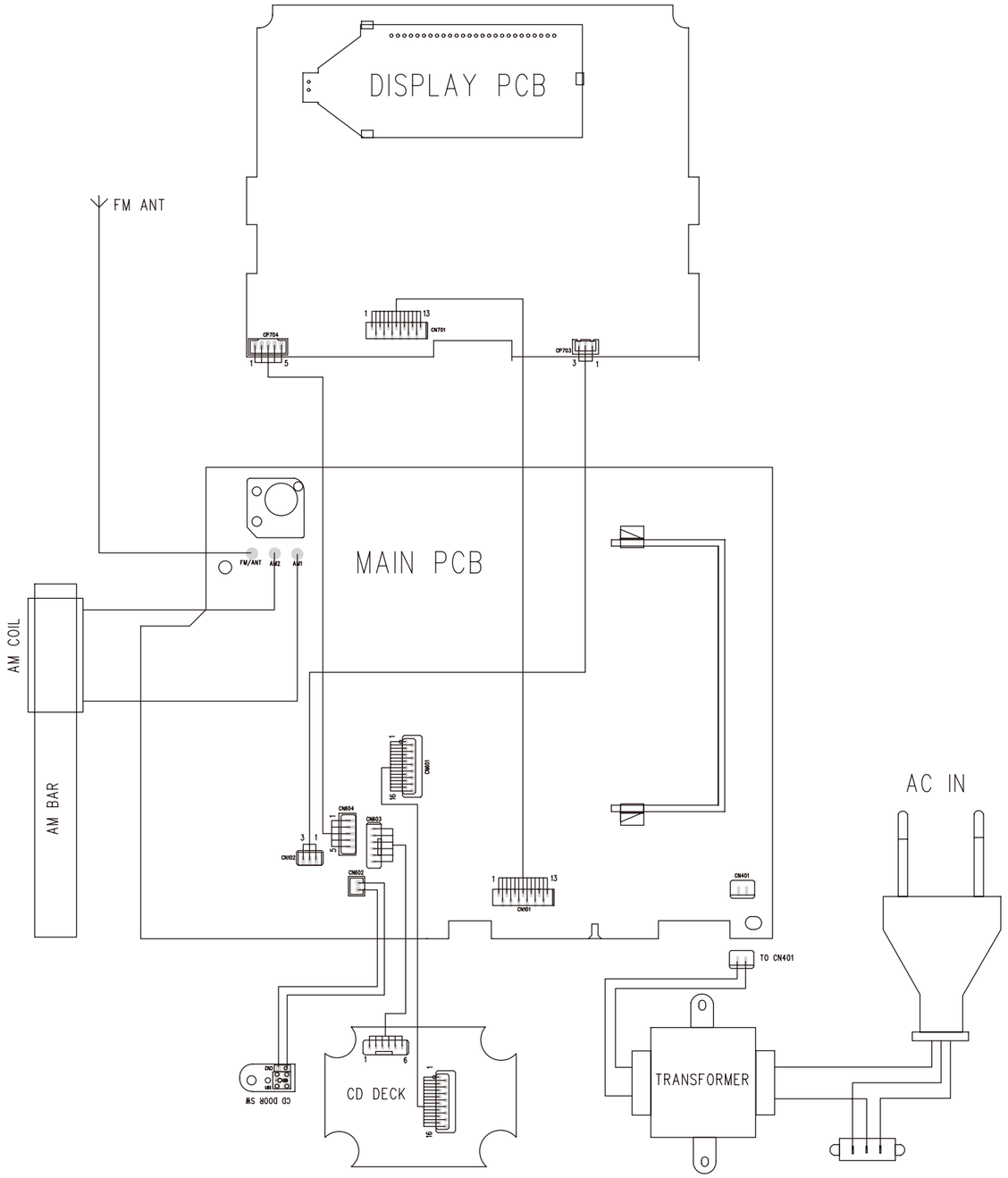
4-1

WIRING DIAGRAM FOR MCM166/12



4-1

WIRING DIAGRAM FOR MCM166/55/77

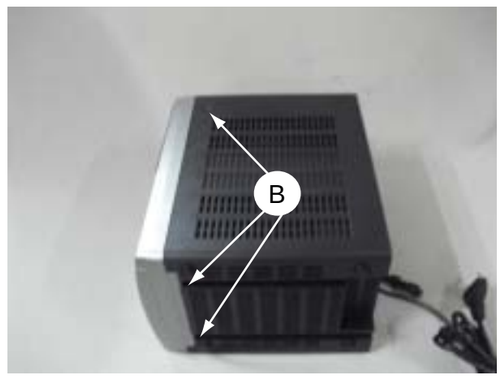


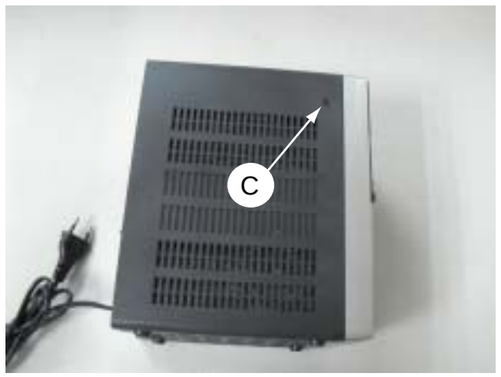
5-1

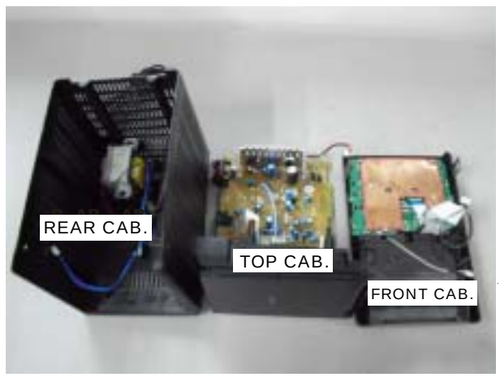
DISASSEMBLY DIAGRAM

Dismantling of the Rear Cabinet

1) Remove 8 screws A&B&C as indicated to loosen the Rear Cabinet.



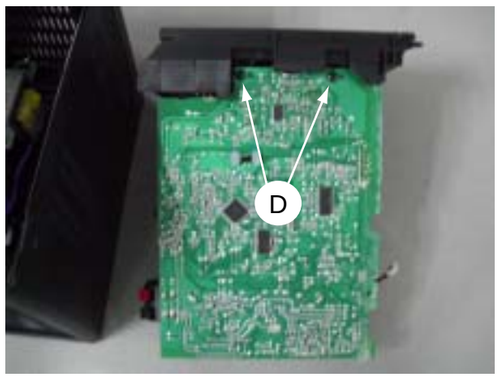


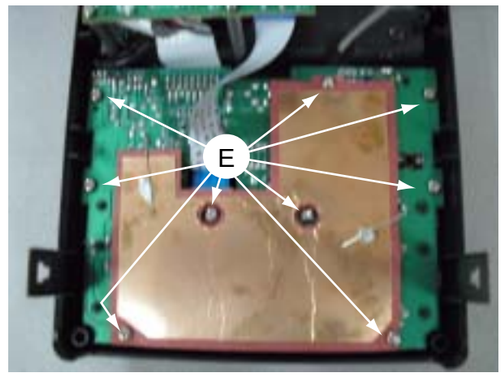


Dismantling of the PCB Board

1) Remove 2 screws D as indicated to loosen the Main Board.

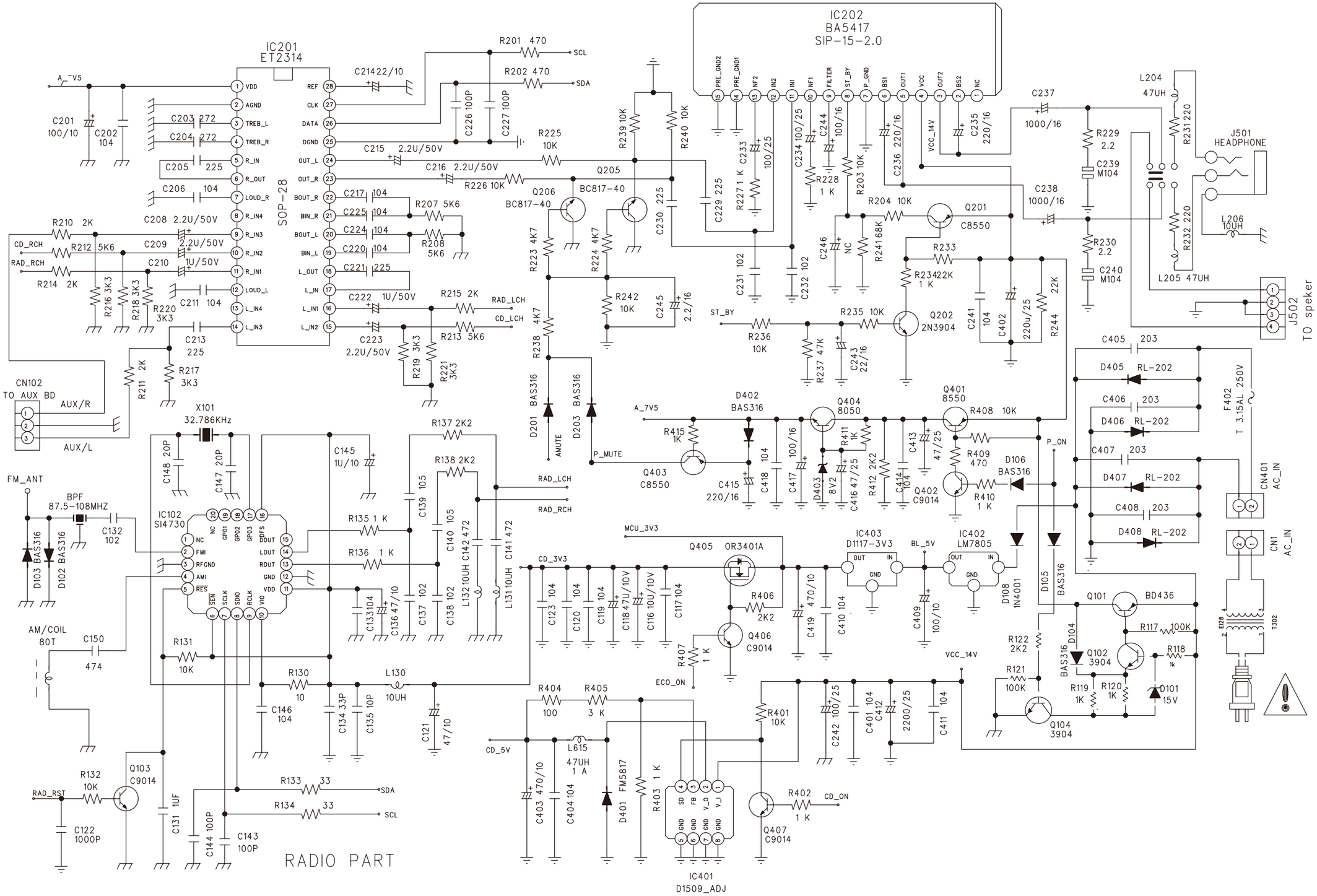
2) Remove 9 screws E as indicated to loosen the Display Board.





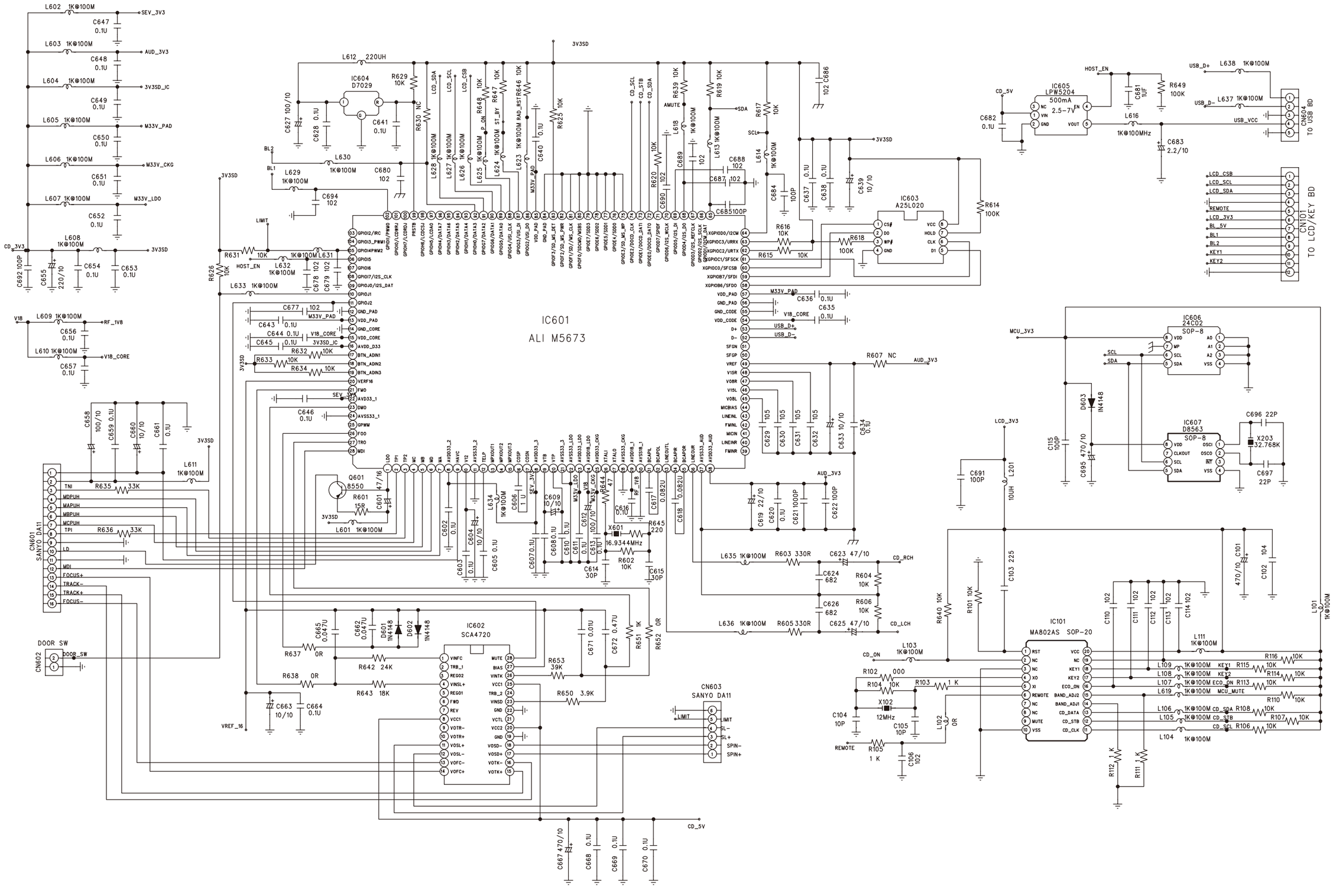
6-1

CIRCUIT DIAGRAM - MAIN BOARD



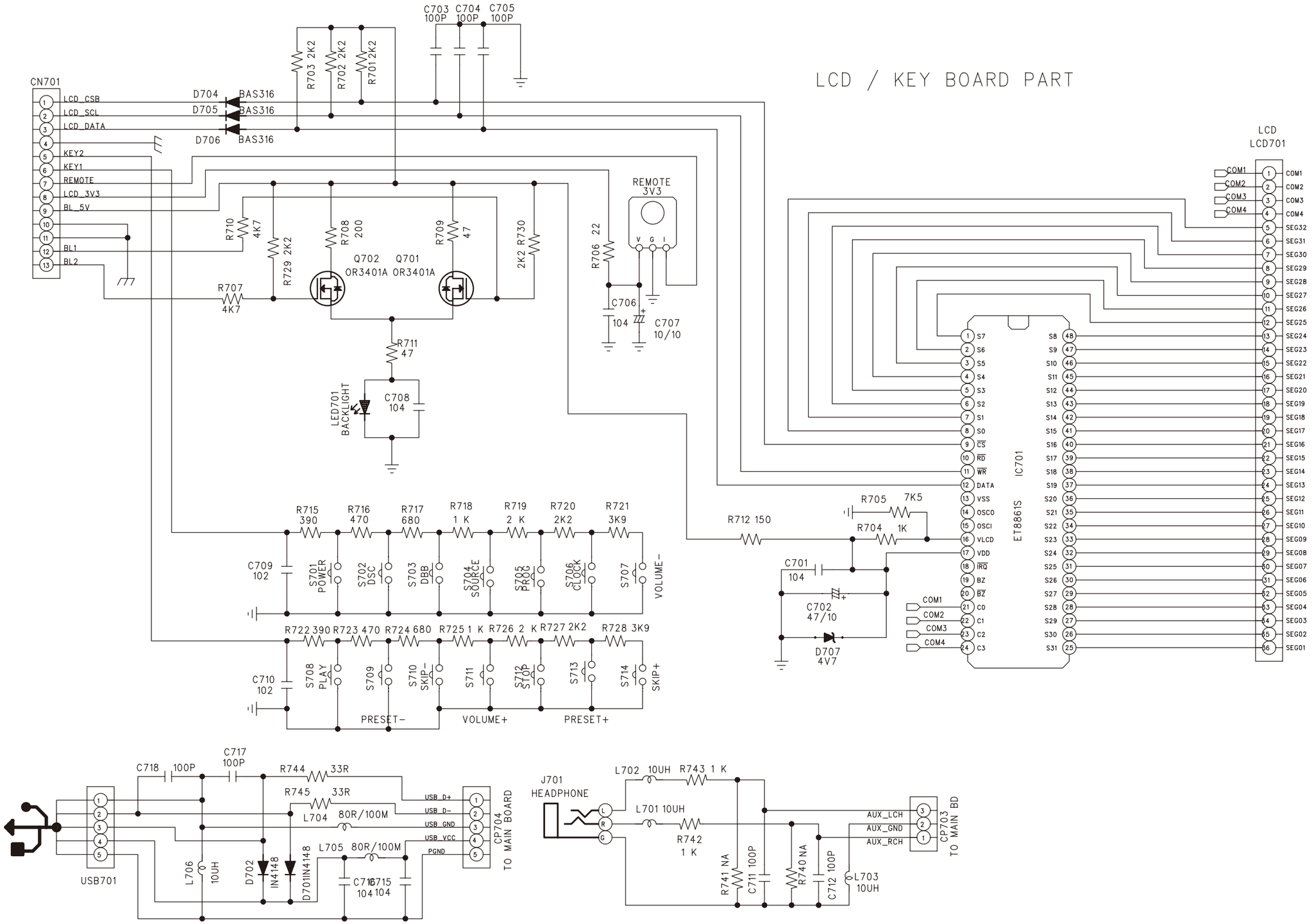
6-2

CIRCUIT DIAGRAM - MAIN BOARD



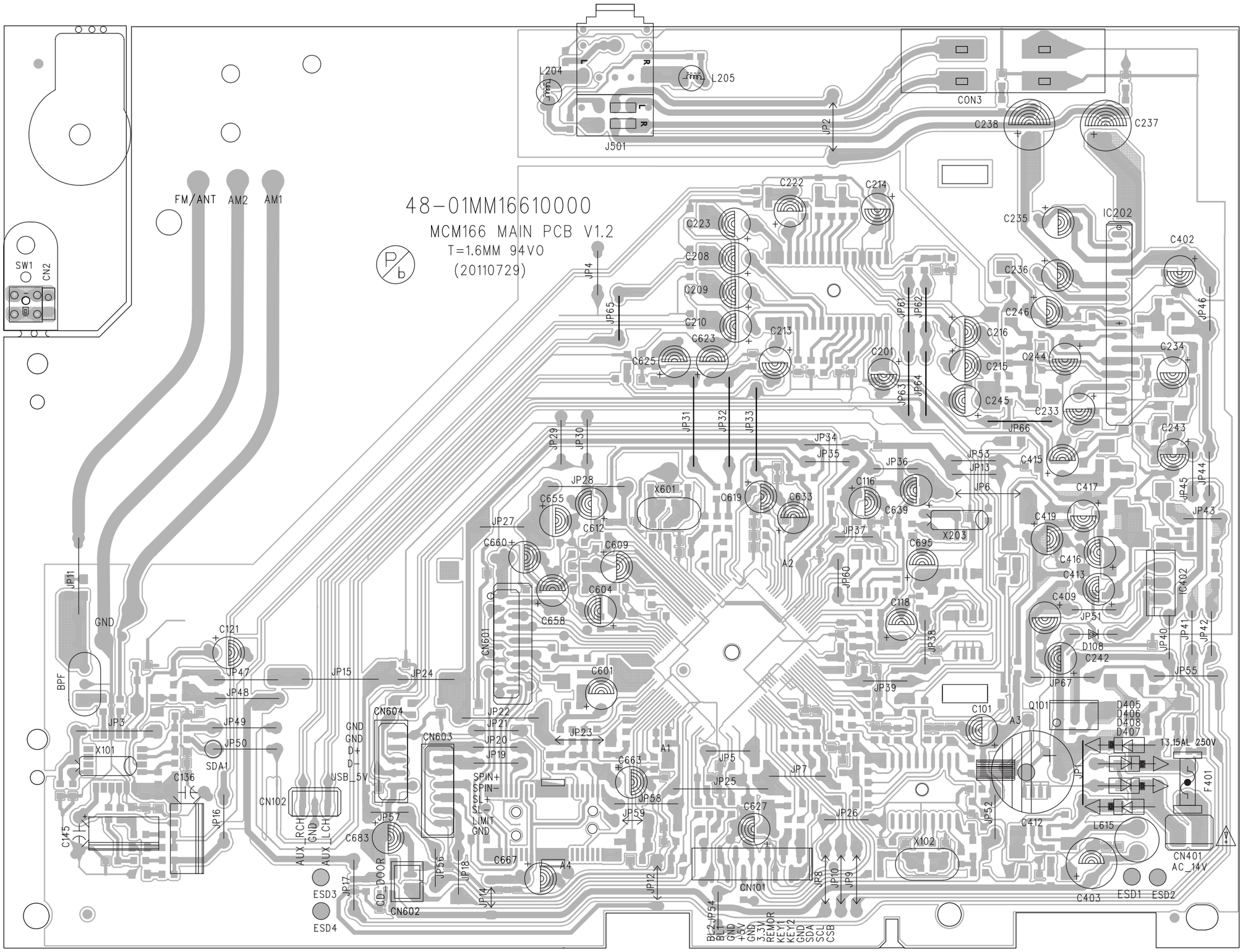
6-3

CIRCUIT DIAGRAM - DISPLAY BOARD

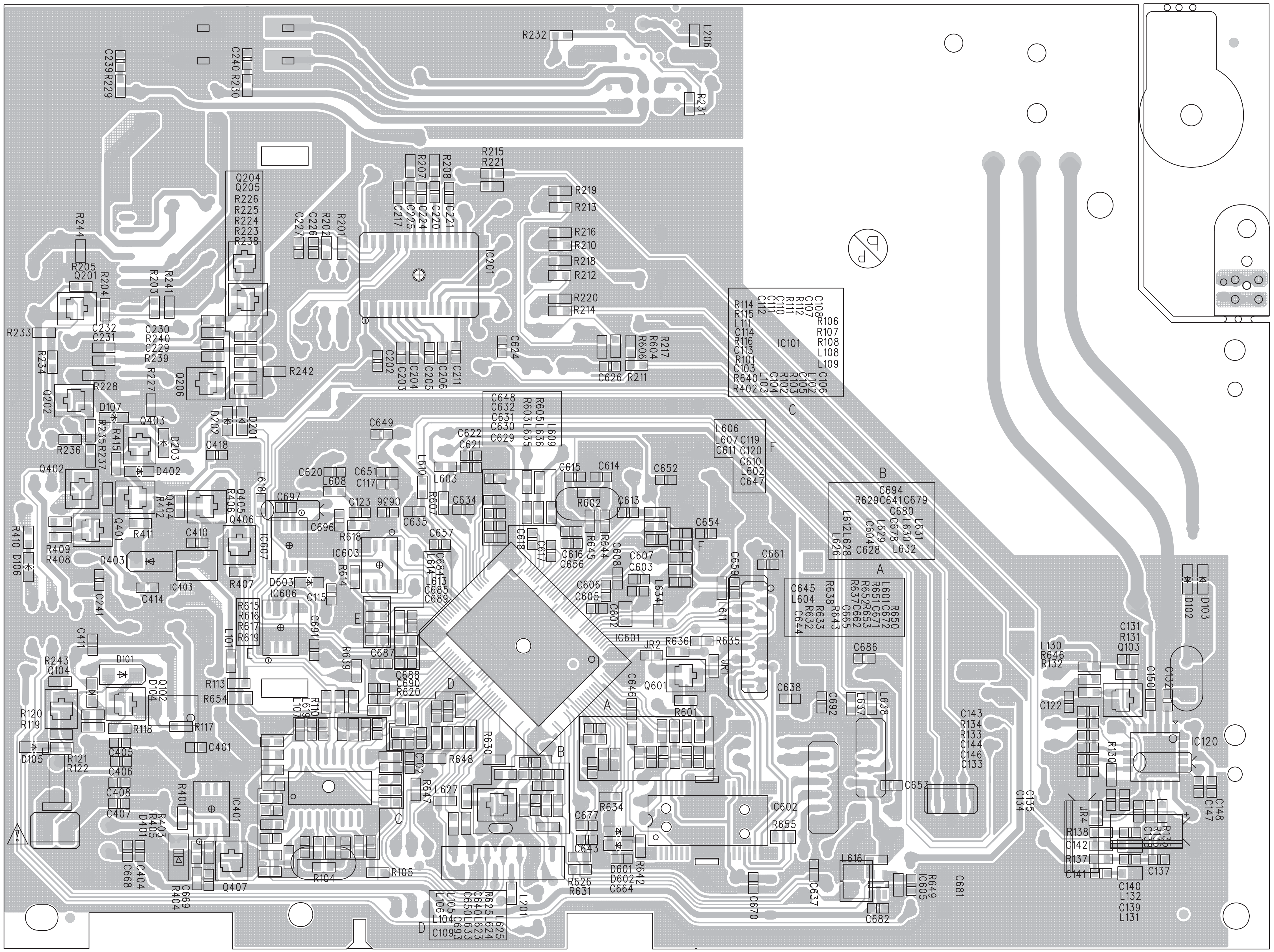


6-4

LAYOUT DIAGRAM - MAIN BOARD
TOP SIDE

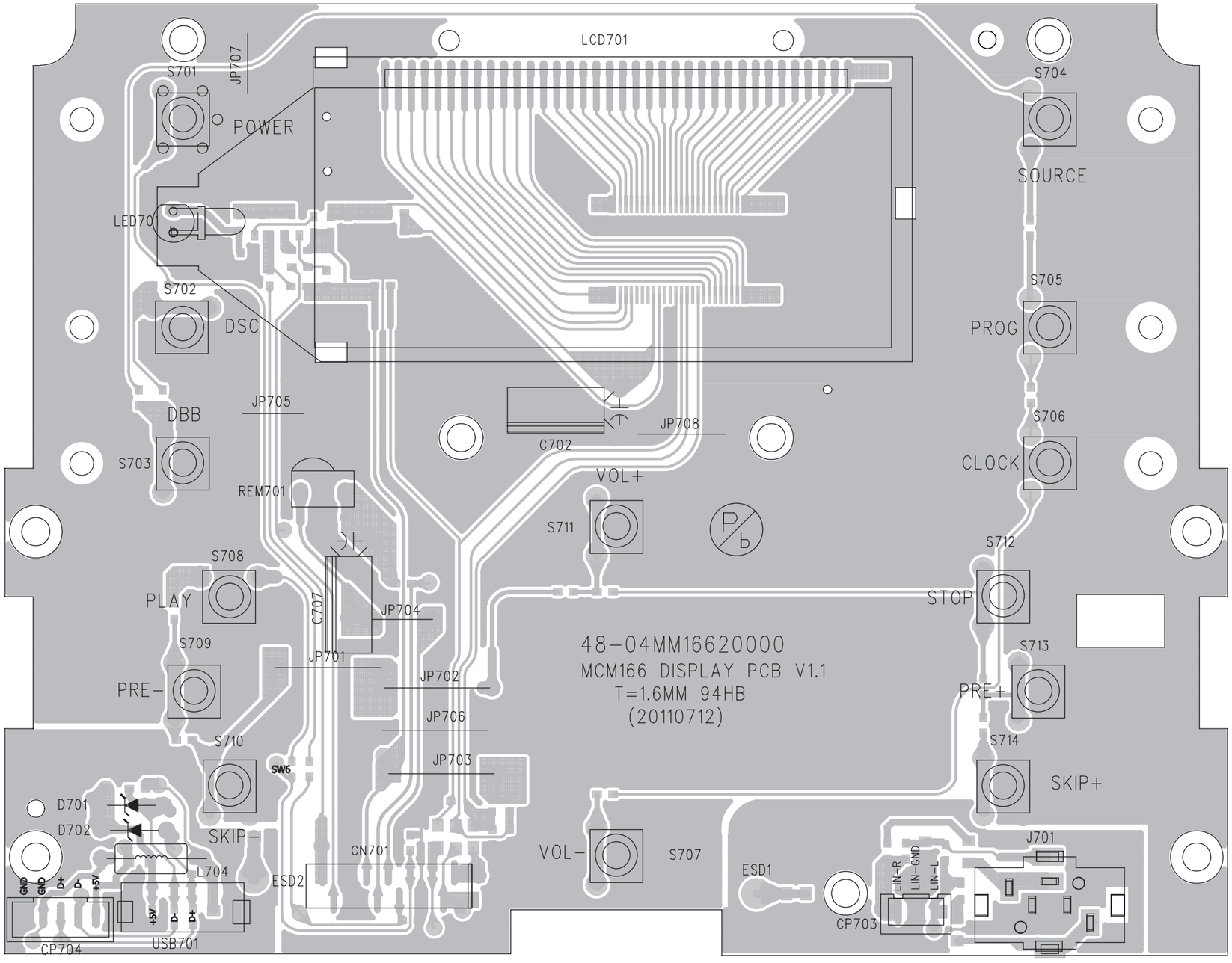


LAYOUT DIAGRAM - MAIN BOARD
BOTTOM SIDE



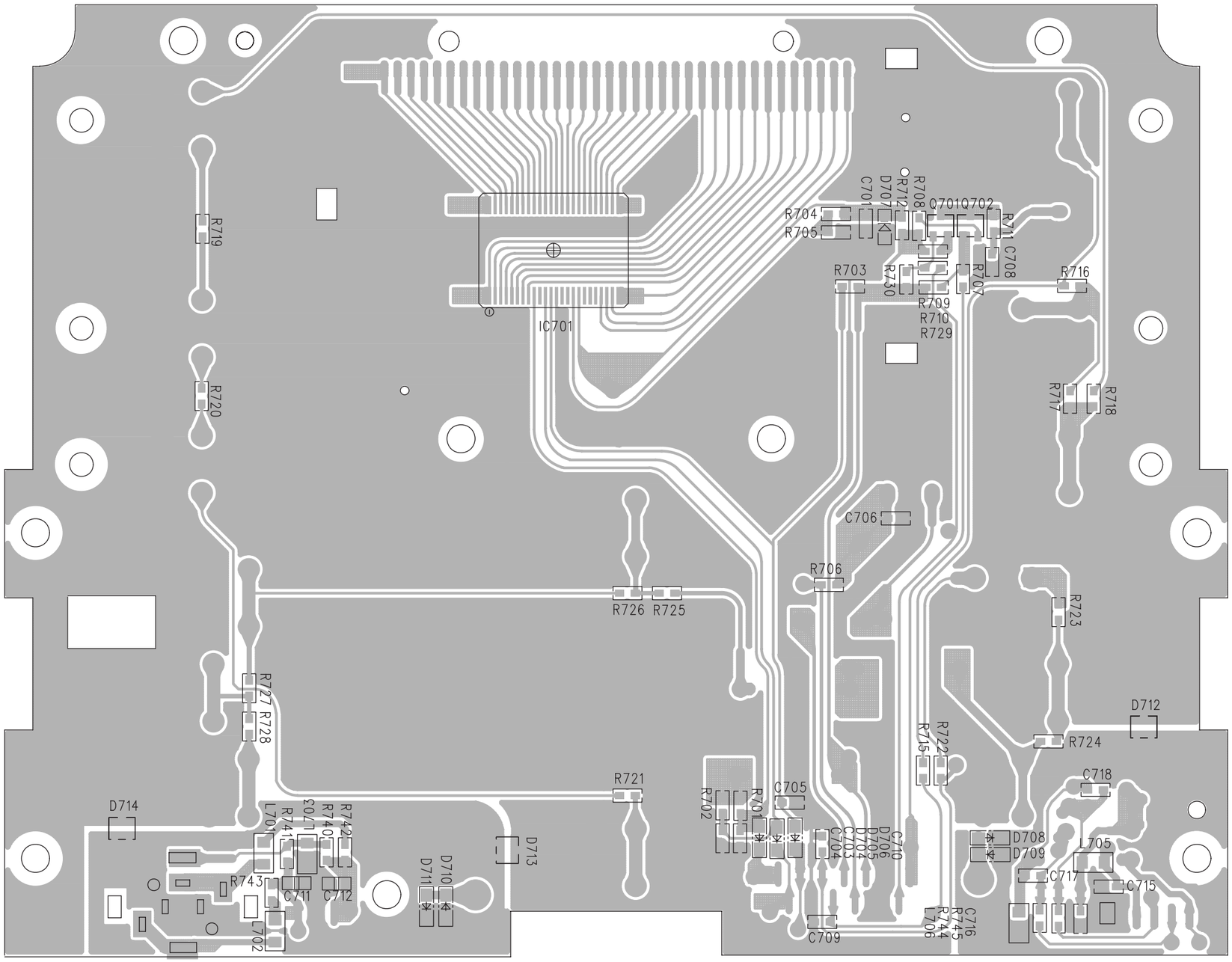
6-6

LAYOUT DIAGRAM - DISPLAY BOARD
TOP SIDE



6-7

LAYOUT DIAGRAM - DISPLAY BOARD
BOTTOM SIDE



7-1

EXPLODED VIEW