Seu Mini Hi-Fi System

FWM3500/all

Service
Service
Service

Service Manual

TABLE OF CONTENTS

CLASS 1
LASER PRODUCT

Published by LX 1211 Service Audio Printed in The Netherlands Subject to modification

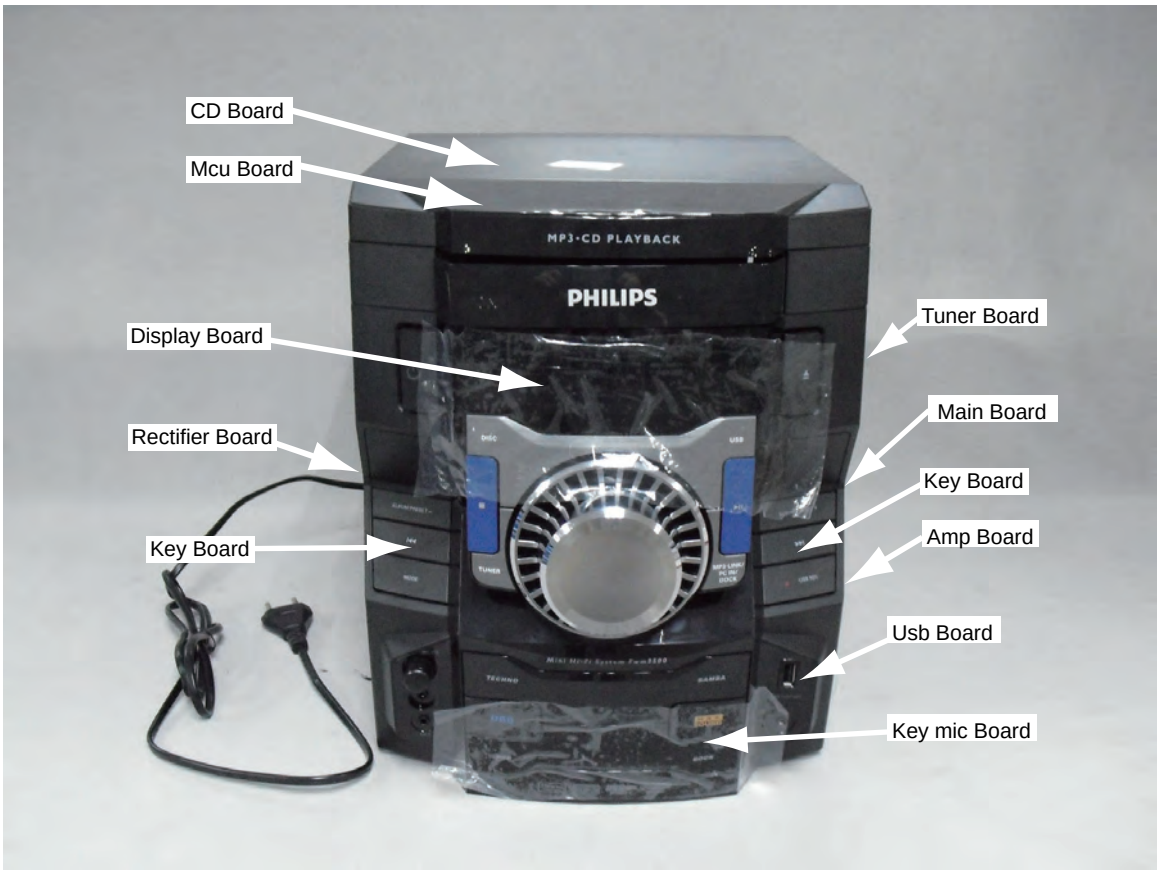
3141 785 37460

Version 1.0

PHILIPS

Technical Specification and Connection Facilities

Location of PC Boards



VERSION VARIATION

Type /Versions: / Service policy / Board in used:	FWM3500									
	/55 (LATAM)	x/77 (ARGENTINA)								
Main BOARD	C/M	C/M								
display BOARD	C/M	C/M								
amp BOARD	C/M	C/M								
key BOARD	C/M	C/M								
mic BOARD	C/M	C/M								
tuner BOARD	C/M	C/M								
cd BOARD	C/M									
mcu BOARD	C/M									
Type /Versions: / Features / Feature diffrence	FWM3500									
	/55	x/77								
RDS										
VOLTAGE SELECTOR										
ECO STANDBY - DARK										

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

FWM3000-3500-4000-4500 SH 190 Contact List

GENERAL DESCRIPTION

MP3-USB Mini Hi FiSystem with Digital Tuner, 3CD/MP3(for FWM4000/4500) 1CD/mp3for FWM3000/3500)
(50W x 4 FOR FWM3000-4000 70WX4 FOR FWM3500-4500)Power Amplifier, LCD Display, Aux in ,
Remote control

LIFETIME : 7 Years

Class	Tuner	Supply + Amplifier	USB	Recorder	Clock	CD-mp3
I			X	N/A		
II	X	X			X	X
III						
Page	10	3-7	9		8	11

SAFETY requirements

Version	Safety	EMC
/98	EN 60065	CISPR 13
/55	EN 60065	CISPR 13
/12	EN 60065	EN 55013 / EN 55020
/05	EN 60065	EN 55013 / EN 55020
/79	EN 60065	CISPR 13
/37	UL 60065	FCC99

RADIATION / IMMUNITY requirments (EMC) for 12 version only

CLIMATIC requirements

ALL climates : + 5 Dregree till + 35 Degree
MODERATE climates : + N.A till N.A Degree

PERFORMANCE CLASSES

POWER SUPPLY

MAINS (A.C.)	120 Vac (110V-10%, 120V ±10%)	230 Vac ± 10 %	127 / 240 Vac ± 15 %	240 Vac ± 10 %	220 Vac ± 10 %
Version	/ 37	/ 12 /05	/ 55 /98/96	/ 79	/ 61, /93
Voltage Selection	No	No	Yes	No	No
Frequency	60Hz ±5%	50Hz	60/50Hz	50Hz	60Hz, 50Hz

POWER CONSUMER

	FWM3000-4500/ 12/	FWM3000-4500/ 55/98/96	FWM3000-4500/79 /61 /93	FWM3000-4500/ 37
Stadby :	< 25W	< 25W	<25W	<25W
(DEMO mode " OFF ") , NOM. A, INPUT				
Maximum :	FWM3000/4000<110W	FWM3000/4000<110W	FWM3000/4000<110W	FWM3000/4000<110W
@ 1/8 Prated , NOM. A, INPUT	FWM3500/4500<130W	FWM3500/4500<130W	FWM3500/4500<130W	FWM3500/4500<130W
ECO Power mode :	<= 1W	no	<= 1W	<= 1W

Quality : 0.8 % (Major) 2.0 % (Mirror)
Reliability : 3.0 % (C 42)

Tested according to General Test Instruction refer to PHILIPS standary (UAN -D1591)
Measured according to PHILIPS standary (UAN - L1059) unless other wise stated
All not mentioned date, please refer to PHILIPS standary (XUW - 0010 - JUNE 2001)

DERIVED	REMARKS	APPROBATION

Remarks

GENERAL PART 1 - GENERAL SPECICFICATION

Class No		Ver	Issued Date
	FWM3000/3500/4000/4500 All	1	27-009-2011
		2	
		3	

NAME : MZ.FENG			10	10	SH 190 - 3			A4
KT			CHECK	DATE :				

TECHNIAL DESCRIPTION

Total power 200W FOR FWM3000-4000 280W FOR FWM3500-4500), One INPUT SOURCE, (Digital Sound Control). IS (Incredible Sound)

GENERAL PART

OUTPUT stage Protection : Yes Temperature : Yes. Shorcircuit : Yes

LoudSpeaker D.C. Protection : Yes.

INDICATORS

Standby Mode Indicator : LCD display Clock active

ECO Mode Indiicator : LCD turns off, ECO - Standby LED turn on

ELECTRICAL DATA

DSC :	Rock, Pop, Jazz, Optimal	Channel Differencer at -46dB	3	dB
MAX	YES	Hum (Volume Minimun - 50mW)(A - weighted)	< 200	nW
IS :	YES	Residual Noise (Volume Minium)(A - weighted)	< 100	nW
VAC :	N/A	Channel Separation (at 1 kHz)	⩾ 45	dB
WOOX :	N/A	Signal / Noise (weighted)	⩾ 60	dB
Frequency Response (+/- 3dB), reference 1kHz		60Hz - 16kHz		

INTERCONNECTS

Input Sensitity(±2 dB)rated ouput power at 1 kHz and 10kHz. Line Output Voltage (*1)

Tuner	:	FM 67.5KHz,AM 80% Modulation - 3dB	Line Out (Left / Right)	N.A
CD	:	0 dB track (Audio Disc 1, Trk 35)	Subwoofer Out	N.A
USB	:	0 dB track	Headphone	N.A
AUX	:	Nor: 600mV Lim: 450mV ~ 550mV for /37	Digital Coaxial Out	N.A
	:	Nor: 2V Lim: 1.5V ~ 2.5V for /55	Booster Out	N.A

Microphone : input leven Nor: 1.5mv Lim:0.8-2.5mv Rs=600ohm (output=500MW)

OUTPUT POWER (* 1) At THD = 10% (Measured with 20Hz-20KHz filter), both channels driven (Low channel at 1KHz, High channel at 10k)

Power output (RMS) FOR FWM3000/4000	Low channel	50W per channel (Lim '-1dB) (CD USB AUX)
Power output (RMS)FOR FWM3000/4000	High channel	50W per channel (Lim '-1dB) (CD USB AUX)
Power output (RMS)FOR FWM3500/4500	Low channel	70W per channel (Lim '-1dB) (CD USB AUX)
Power output (RMS)FOR FWM3000/4500	High channel	70W per channel (Lim '-1dB) (CD USB AUX)

Frequency Response

LOW Frepuency	Frequency Response - 60Hz - ref. 1kHz ±3 dB
LOW Frepuency	Frequency Response - 5.8KHz - ref. 1kHz ±3 dB
HI Frepuency	Frequency Response -6KHz - ref. 10kHz ±3 dB
HIFrepuency	Frequency Response - 18KHz - ref. 10kHz ±3 dB

Rated Impedance

: 4 Ohms (for FWM4000) (8R for FWm3000 3500 45000) at 60Hz to 16 KHz

Remarks

(*1) Electrical parameters are to be measuremend at specker terminals
with rated input signal in AUX mode; DSC setting in Jazee mode with DBB OFF
IS off and OSM unless specified otherwise
One channel signal input (L or R), two channel load (< Low ch. L + High ch. L > or < Low ch. R + High ch. R >)
Measuremend output power only for AUX model and CD model of used audio analyzer equipment.

GENERAL PART 1 - TECHNAICAL SPECICFICATION

Class No		Ver	Issued Date
	FWM3000/3500/4000/4500All	1	
		2	27-009-2011
		3	

NAME : MZ.FENG		10	10	SH 190 - 4			A4
KT		CHECK	DATE :				

AUDIO SIGNAL PROCESSING

MP3-USB Mini Hi Fi System with Digital Tuner ,Class AB Power Amplifier

1) DSC (Digital Sound Control)

Select AUX as input source with the following set conditions:

Inject sine wave 2V at 1 KHz to L/R channels of AUX-IN socket.

Set DSC to JAZZ(Flat) mode and switch off DBB. Max off

Refence level for DSC's without DBB on=500mW.

Refence level for DSC'S with DBB on=1.7V at the speaker terminal .

Inject sine wave 2V to AUX-IN socket with frequencies indicated in Table 1.

Tabel 1a (Tolerance ± 3dB)

Frequency	DSC Modes with DBB Off				
	JAZZ	POP	ROCK	JUNGLE	SAMBA
60 Hz	-1.8 dB	+ 3 dB	+ 6dB	+0.5dB	+0.3dB
1 kHz	0 dB	0.5db	1 dB	0.5dB	0
10 kHz	-1.5 dB	-0.6dB	+1 dB	-0.5 dB	-3

Tabel 1b (Tolerance ± 3dB)

Frequency	DSC Modes with DBB 1 ON				
	JAZZ	POP	TECHNO	OPTIMAL	SAMBA
60 Hz	+3 dB	+8dB	+ 8.5dB	5.5 dB	+5.5dB
1 kHz	0 dB	+1 dB	1 dB	+1 dB	0
10 kHz	-1.5 dB	+-0.6dB	+1dB	-0.5dB	-3

Tabel 1b (Tolerance ± 3dB)

Frequency	DSC Modes with DBB 2 ON				
	JAZZ	POP	TECHNO	OPTIMAL	SAMBA
60 Hz	+8dB	+ 14.0 dB	+ 15.0 dB	+ 11.0 dB	+11dB
1 kHz	+0 dB	+1dB	+1 dB	+1 dB	0
10kHz	-1.5 dB	+ 1dB	+2 dB	- 0.5dB	-0.5

Tabel 1b (Tolerance ± 3dB)

Frequency	DSC Modes with DBB 3 ON				
	JAZZ	POP	TECHNO	OPTIMAL	SAMBA
60 Hz	+14 dB	+ 17.0 dB	+ 20.0 dB	+ 18.0 dB	+18dB
1 kHz	+0dB	+1dB	+1dB	+1 dB	0
10 kHz	-0.5 dB	+ 2dB	+3dB	+ 1dB	1

AUDIO SIGNAL PROCESSING

MP3 - USB Mini Hi Fi System with Digital Tuner , 3 CDC-MP3 for FWM4000/4500. 1CDCfor FWM3000/3500

3) IS (Incredible Sound)

Select AUX as input source.
Inject sine wave 2V at 1kHz to AUX-IN socket, one channel at a time (input level 500mV for /37,2V for /55).
Set DSC to JAZZ (Flat) mode and switch of DBB, OSM & INCREDIBLE SURROUND.
Adjust volume level to obtain 500mW across 4OHM load at L/R speaker output.
Inject sine wave 2V to AUX-IN socket withfrequency indicated in Table 3 (input level 500mV for /37,2V for /55).
Right channel reference to left channel.

Table 3 (Tolerence ± 3 dB)

FREQ	INPUT LEVEL		OUTPUT LEVEL			
			IS OFF		IS ON	
	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
60 Hz	2V	-	- 1.0 dB	-	+2.0 dB	-17.0 dB
1 kHz	2V	-	0	-	+ 3.5 dB	-0 dB
10 kHz	2V	-	- 0.5 dB	-	+ 3.0 dB	-7.0 dB

Note : The above specs also apply to right channel.

4) DSC Mode (Jazz , Rock, Techno and Optimal)

The VEC modes are software controlled by switching the combination between DBB and DSC modes as show in Table 4.

DSC MODE	DBB Level preset
Jazz	DBB OFF
POP	DBB 2
Techno	DBB 3
Optimal	DBB 1

Note : When these modes are activ DBB and DSC will not be displayed

5) MAX (Maximum Sound)

Select AUX as input source.
Inject sine wave 2V at 1kHz to AUX-IN socket, one channel at a time (input level 600mV for /37,2V for /55).
Set DSC to JAZZ (Flat) mode and switch of DBB, OSM & INCREDIBLE SURROUND.
Adjust volume level to obtain 500mW load at L/R speaker output.
The 500mW level will be used as 0 dB reference
Inject sine wave 2V to AUX-IN socket withfrequency indicated in Table 5 (input level 600mV for /37,2V for /55).

FREQ	Max OFF	Max ON
60 Hz	00 dB	+ 19 .0 dB
1 kHz	0	+ 7.0 dB
10 kHz	- 0.5 dB	+ 10.0 dB

TECHNIAL DESCRIPTION

AUX modle

GENERAL PART

Description	Specification
Output power = , 1 Khz)	50W± 1 Db(fwm3000/4000) 70W± 1 Db(for fwm3500/4500)
Channel Unbalance	< = +/- 3 dB
THD + Noise (0dB, 1Khz)	<=2%
Channel Crosstalk ((0dB, 1 KHz)	>= 40dB
(0 dB, 10 KHz)	>= 40dB
Signal to Noise Ratio (0dB,1kHz) (A - weighted)	>= 60dB(A - weighted)
Frequency Response (+/- 3dB), reference 1kHz	60Hz - 16kHz
Microphone	
Description	Specification
Output power = , 1 Khz 2mV input)	1W± 1 dB
THD + Noise (0dB, 1Khz)	<=5%
Signal to Noise Ratio (0dB,1kHz) (A - weighted)	>= 45dB(A - weighted)
Frequency Response (+/- 3dB), reference 1kHz	100Hz - 16kHz

Remarks :

USB SPECICFICATION

Class No		Ver	Issued Date
FWM3000-4500 All		1	27-009-2011
		2	
		3	

NAME : MZ.FENG	10	10	SH 190 -9			A4
		CHECK	DATE :			

TECHNIAL DESCRIPTION

SOFTWARE IMPLEMENTED CLOCK / TIMER FUNCTION WITH 32.768KHZ QUARTZ OSCILLATOR.

GENERAL PART

Timer Setting	:	Clock and Timer
Timer Wakeup Mode	:	CD USB or Tuner
Remarks Time Setting	:	12hr for /37 version, 24hrs for other version.
Volume at Wakeup	:	Last Setting
No of Timer Settings	:	1
Clock Accuracy	:	Nom : 1 sec/day Limit : 2 sec/day

INDICATORS

Display Type	:	LCD

Remark

CLOCK / TIMMER SPECICFICATION

Class No			Ver	Issued Date
		FWM3000/3500/4000/4500All	1	27-009-2011
			2	
			3	

NAME : MZ.FENG			10	10	SH 190 - 7		A4
KT			CHECK	DATE :			

TECHNIAL DESCRIPTION

USB

See also SH 190 USB Audio Module (300605)
Measurment are directly done at the coonector on the board

GENERAL PART

Measurement are directly done at the connector on CDC board

Description	Specification
Output Resistance	< = 1.5 kOhm
Output Voltage RL = 33 k ohm dB, 1 Khz	NC
Channel Unbalance	< = +/- 1 dB
THD + Noise (0dB, 1Khz)	<=1.5%
Channel Crosstalk (1k)	>= 40dB
(0 dB, 10 KHz)	>= 40dB
Signal to Noise Ratio (0dB,1kHz) (A - weighted)	>= 60dB(A - weighted)
Frequency Response (+/- 3dB), reference 1kHz	60Hz - 16kHz

USB Measurement at Set Level

Electrical Parameters are to be measured at speaker teminals across 6 ohm load with 500mW output and DSC setting in Jazz Mode

Description	Specification
Channel Crosstalk (0 dB, 1 KHz)	>= 40dB (with 1 KHz filter)
Signal to Noise Ratio (0 dB, 1 KHz)	>= 60dBA (A - weighted)
Channel Unbalance (0 dB, 1 KHz)	< +/- 1.5dB
Frequency Response (+/- 3dB), reference 1kHz	60Hz - 4kHz
Frequency Response (+/- 4dB), reference 10kHz	4KHz - 16kHz

Remarks :

USB SPECICFICATION

Class No		FWM3000-4500All		Ver	Issued Date
				1	27-009-2011
				2	
				3	

NAME : MZ.FENG			10	10	SH 190 -8			A4
			CHECK	DATE :				

TECHNIAL DESCRIPTION

GENERAL PART

WAVE RANGE	TOLERANCE	TUNING GRID
FM(55/37) 87.5 - 108.00 MHz	QUARTZ PRECISION	100 kHz
FM(12) 87.5 - 108.00 MHz		50KHZ
AM (55/37) 530 - 1700 kHz	QUARTZ PRECISION	10 kHz
AM (12) 531 - 1602 kHz	QUARTZ PRECISION	9 kHz

AERIAL

FM : PIGTAIL ANT WIRE 300 Ohm(for/37) 75ohm for 55/12

AM : FRAME ANT. 18.1 uH

INDICATORS

LCD

ELECTRICAL DATA

A.M	Nom	Limit	Unit	F.M.	Nom	Limit	Unit
				- 3 dB Limiting Point	: 17	23.5	dBf
Amplification Reverse	: - 2	-4	dB	Amplification Reverse	: 0	-4	dB
AGC Figure of Merit	: 30	25	dB	Distortion (RF 1mV, Frq Dev.75 kHz)	: 2	5	%
Distortion (RF 50mV, M 80%)	: 3	5	%	Stereo - 46 dB Quieting	: 38	43	dBf
IF	: 450	± 3	kHz	Crosstalk (RF1mV, Freq Dev.40kHz)	: 25	18	dB
Modulation Hum.	35	30	dB	Modulation Hum.	45	40	dB

Wave Range		Noise Limited Sensitivity 26 dB			Image Rejection	IF Rejection	Large Signal	Selectivity S3 / S9 / 300kHz
MW 610 kHz	Nom.	3500		uV/m	32 db	28db	1000mv/m	22db
	Lim.	4000		Uv/m	28db	24db	500mv/m	18db
MW 1400 kHz	Nom.	1500		uV/m	32db	28db	1000mv/m	22db
	Lim.	4000		uV/m	28db	24db	500mv/m	18db
FM 98 MHz	Nom.	18		dBf	40db	65db	116 dBu	45db
	Lim.	22		dBf	30db	60db	108 dBu	25db
	Auto Search sensitivity							
MW 610 kHz	Nom.	58		db/m				
	Lim.	± 10		db/m				
MW 1400 kHz	Nom.	58		db/m				
	Lim.	± 10		db/m				
FM 98 MHz	Nom.	26		dBuV				
	Lim.	± 10		dBuV				

Remarks

TUNER SPECICFICATION

Class No		Ver	Issued Date
	FWM3000/3500/4000/45000All	1	27-009-2011
		2	
		3	

NAME : MZ.FENG			10	10	SH 190 - 9			A4
KT			CHECK	DATE :				

TECHNIAL DESCRIPTION

CD + MP3 - Part Specifications (CD MECHAISM DA11VF OF SANYO) 3DISC for FWM4000/4500 1DISC for FWM3000/3500

	Input	Output	Motor	Logic control
Active components	BU9543	BU9543	SA5888	74HC4094
	Signal processsing	D/A converter	HF-preamplifier	Servo processor
Active components	BU9543	BU9543	BU9543	BU9543

AUDIO part: Measurement with Audio Signals Disc TCD-781 on spkeakers or Headphone socket with nom.load

Description	Extern	Nom	Lim	Unit
De-emphasis		15us / 50us Switchable via Subcode information		
Frequency accuracy		N/A	± 0.5	%
Channel Unbalance		0.5	1.5	dB
Frequency Response (60Hz - 16 kHz)		0	± 3	dB
Signal to Noise Ration (Unweighted)		60	55	dBA
Signal to Noise Ration (A - weighted)		65	60	dBA
Crosstalk (1kHz) (A - weighted)		55	40	dB
Crosstalk (10KHz) (A - weighted)		50	40	dB
Hum & Noise (*1)		1	2	Mv
THD (1KHz -6dB)		0.2	<1.5	%
THD (10KHz -20dB)		<1	<1.5	%

REMARKS:

1. Amplification reserve for CD = +2dB ('±2dB),Ref.Level for CD is a 0dB track instead of a .-6dB track.

Playability :(acc.To AR 30-05-239)

	Limit	Typical	Test disc
Wedge	600um	900um	TNO 7, 9 of SBC 444A(7104 099 24990)
Eccentric	150um	200um	TNO 1, 24 of 200um disc (7104 099 24960)
Fingerprint	No audible defect		TNO 11 of Sub chassis 8A
Black dot	500um	800um	TNO 13 of SBC 444A (7104 099 24990)
Skew 0.6mm	No audible defect		TNO 1,6 of 0.6mm skew (7104 099 28260)
Bad HF track	No audible defect		TNO 8 of Sub chassis 8A
Playback position	Solid, Normal position (Set is located on a flat surface, floor)		

1. Playback of above mentioned tracks possible wihout track loss or audible defects.
2. Double black dot, max. diameter, thin/disk is according to PQR or AR 30-05-239
3. This unit can playback (only) CD-R or CD-RW discs. For performance specification, Please refer to module. specification of CD99 (3103 308 52190)

VERSION OVERVIEW FWM3000/3500/4000/45000

Ver	DEST	APPROBATION		TUNER				AC SUPPLY			MIC MIX	MATRIX SURR. SPK.
		SAFETY	EMC	Wave RANGE	GRID	AERIAL SOCKET	AERIAL SUPPLIED	MAINS VOLTAGE	SOC.	CORD		
/55 /98	OVS	EN60065 CLASS II SISR TAIWAN	CISPR 13	FM 87.5-108MHz MW 531-1602kHz or 530-1710kHz	50kHz 9kHz 10kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	110-127V Switched 220 - 240V 50/60Hz	IEC	IEC	No	No
/05 / 12	EUROPE	EN60065 SEMKO DEMKO NEMKO SEV BS415-UK	EN55013 EN55020	FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	230V 50Hz	IEC	IEC	No	No
/79	AUST / NZ	EN60065 CLASS II		FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	240V 50Hz	IEC	IEC	No	No
/37	USA Canada	UL 6500	FCC 99	FM 87.5-108MHz MW 530-1710kHz	100kHz 10kHz	JALCO Click Fit JST XH 2P Side	300 Ohm Dipole Loop Sagami 18.1uH	120V 60Hz	UL	UL	No	No
/35	China	EN60065 CLASS II		FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	220V 60Hz	IEC	IEC	No	No
/ 33	Korea	EN60065 CLASS II		FM 87.5-108MHz MW 531-1602kHz	50kHz 9kHz	75 Ohm Coaxial JST XH 2P Side	75 Ohm Pigtail Loop Sagami 18.1uH	220V 60Hz	IEC	IEC	No	No

VERSION OVERVIEW

Class No		FWM3000/3500/4000/4500All		Ver	Issued Date
				1	27-009-2011
				2	
				3	

NAME : MZ.FENG			10	10	SH 190 - 11			A4
KT			CHECK	DATE :				

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.

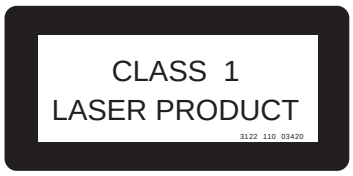
(F)
Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

(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".



(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.

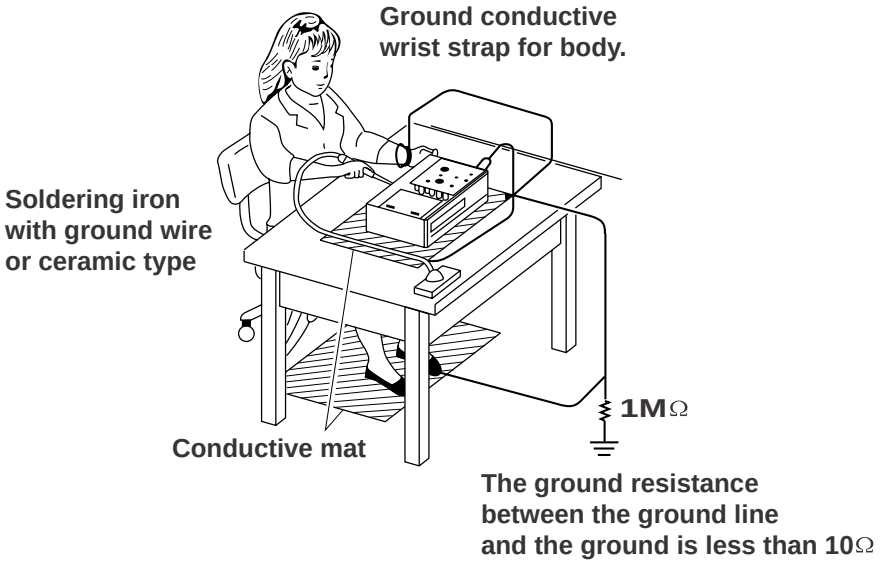
2.1 ESD PROTECTION

- 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.



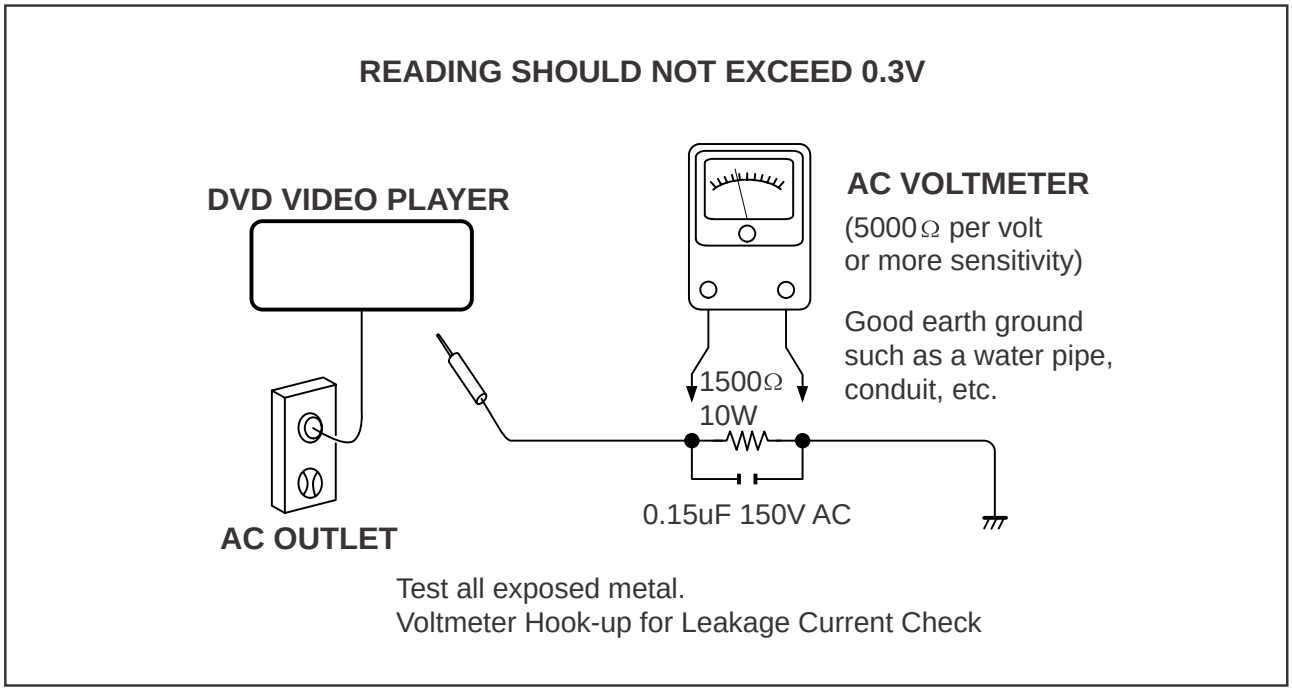
SAFTY NOTICE

SAFTY PRECAUTIONS

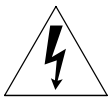
LEAKAGE CURRENT CHECK

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

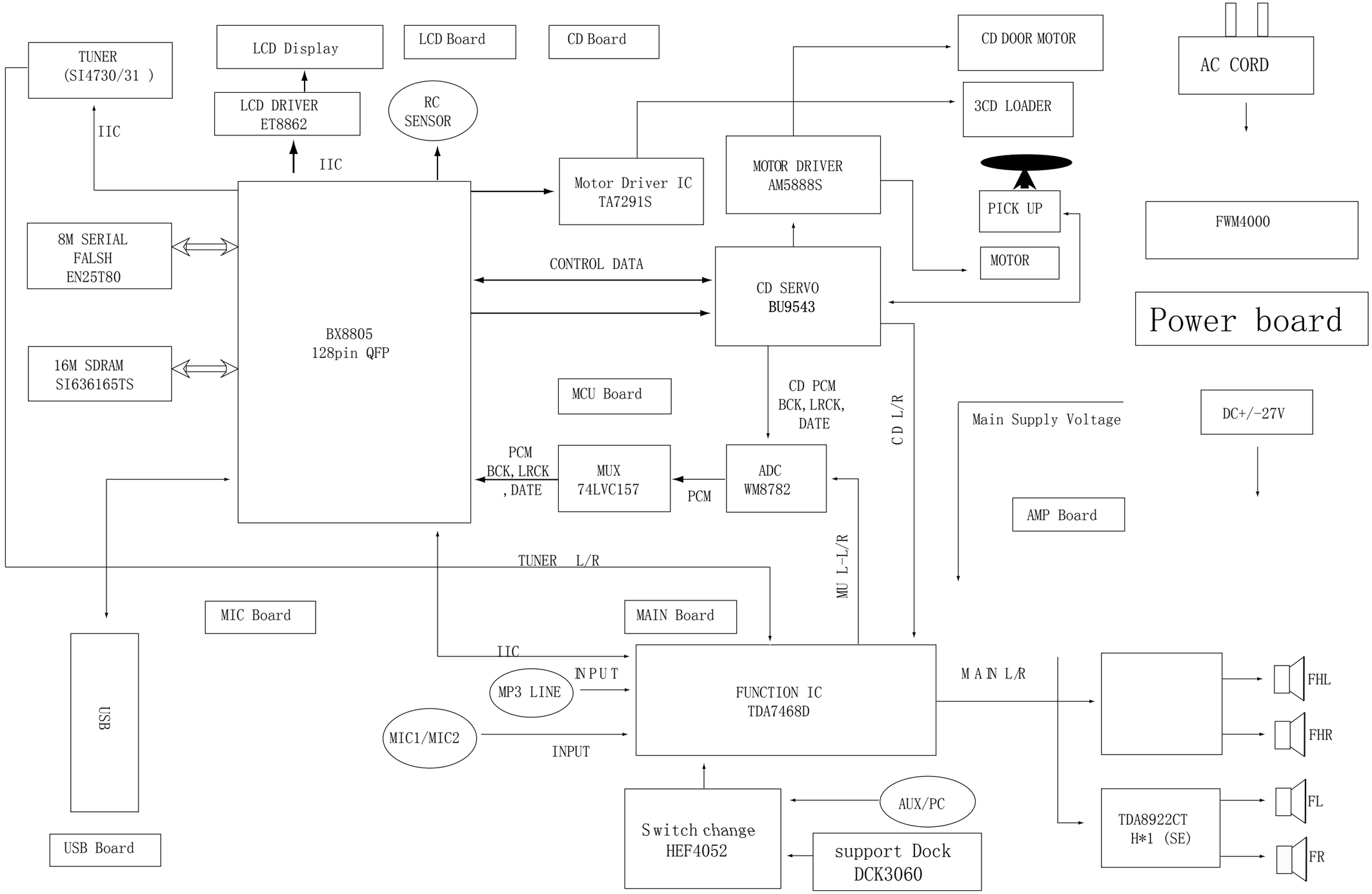


The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

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.

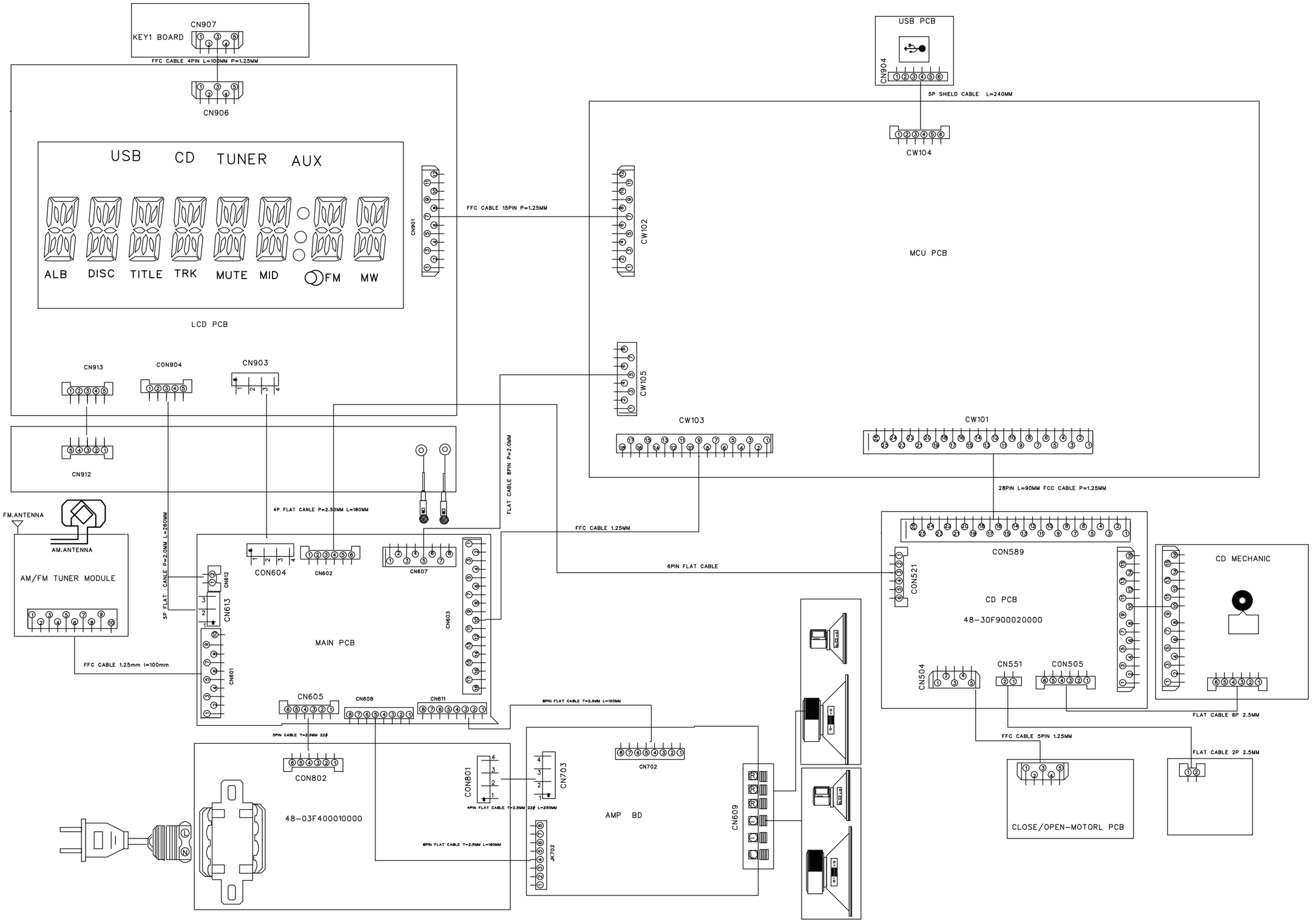
3-1

BLOCK DIAGRAM



4-1

WIRING DIAGRAM

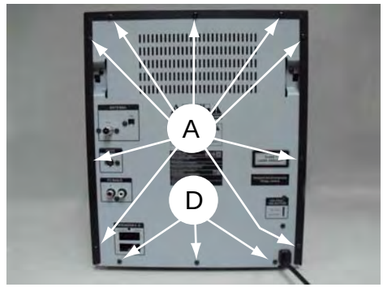


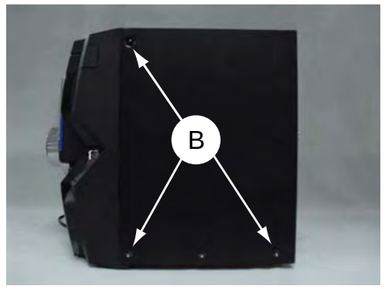
5-1

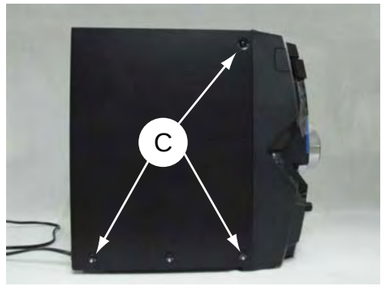
DISASSEMBLY INSTRUCTIONS

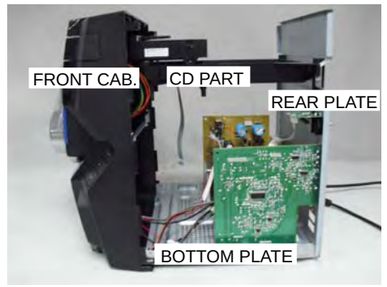
Dismantling of ***OUTER*** *Portion*

1)Remove 9 screws A and 6 screws B/C as indicated to loosen the outer plate.
2)Remove 3 screws D as indicated to loosen the OUTER PLATE.



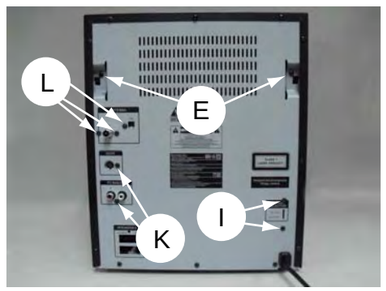


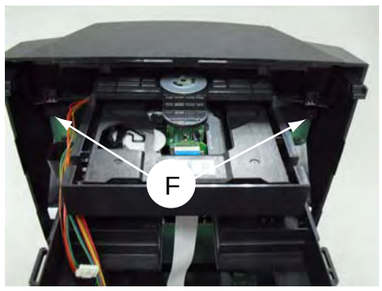


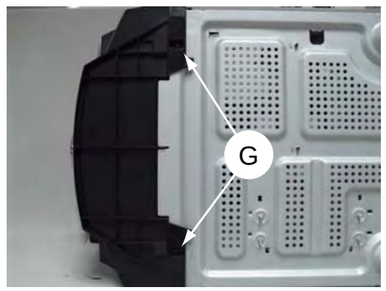


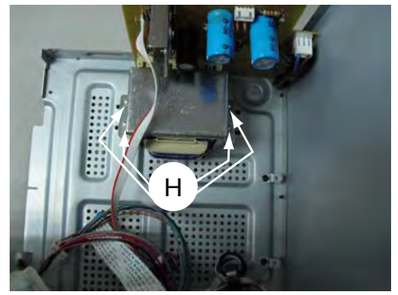
Dismantling of the CD part and Bottom plate and PCB Board

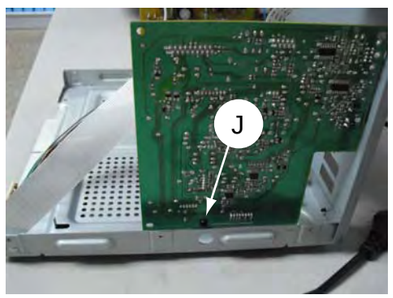
1)Remove 2 screws E and 2 screws F as indicated to loosen the CD part.
2)Remove 2 screws G as indicated to loosen the Bottom Plate.
3)Remove 4 screws H and 2 screws I as indicated to loosen the Rectifier Board.
4)Remove 3 screws K and J as indicated to loosen the Main Board.
5)Remove 3 screws L as indicated to loosen the Tuner Board.
6)Remove 4 screws M as indicated to loosen the Amp Board.
7)Remove screws N as indicated to loosen the Display Board and Key mic Board.

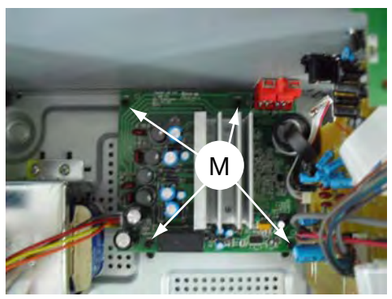


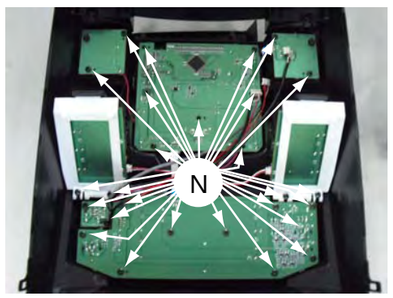






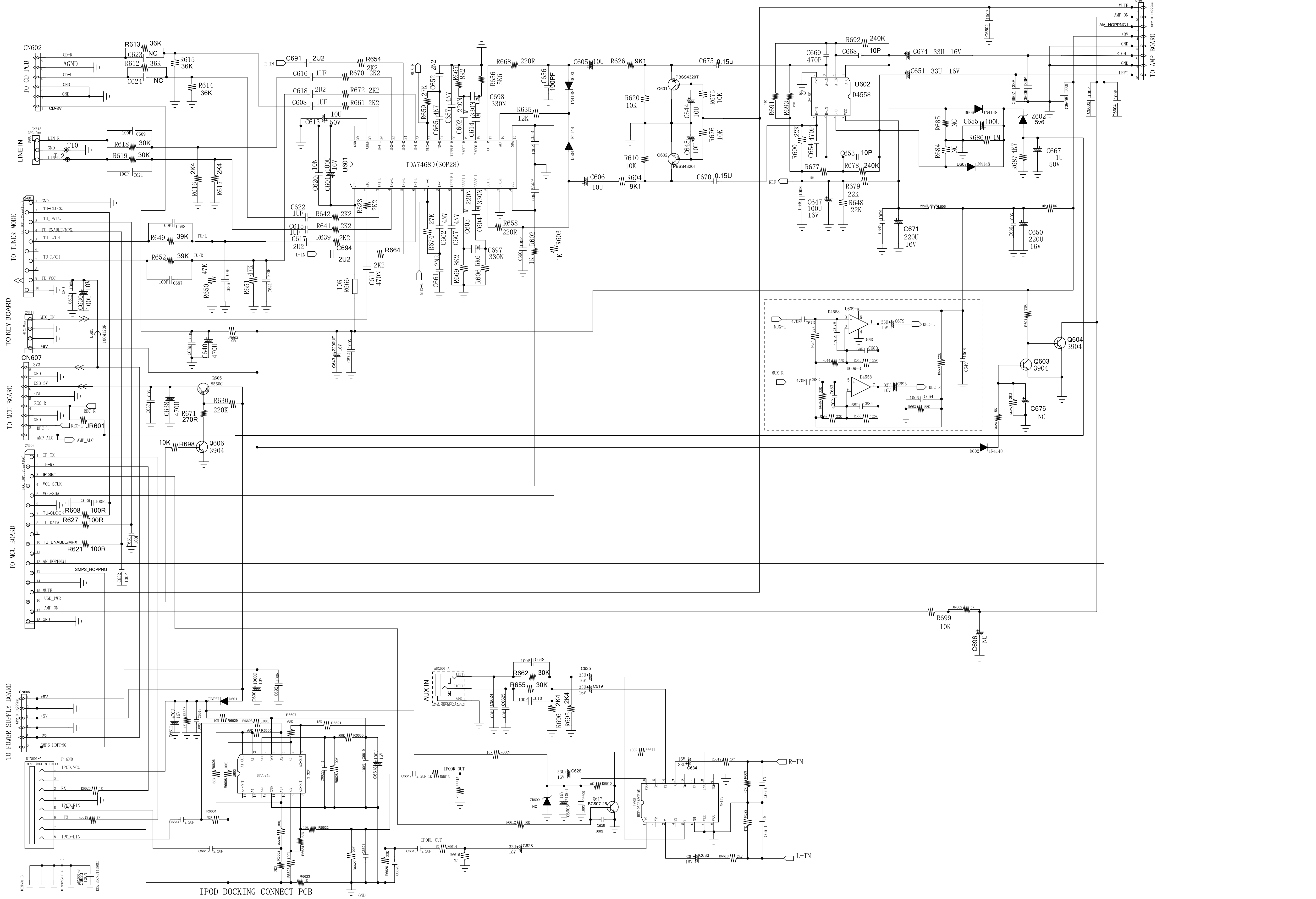






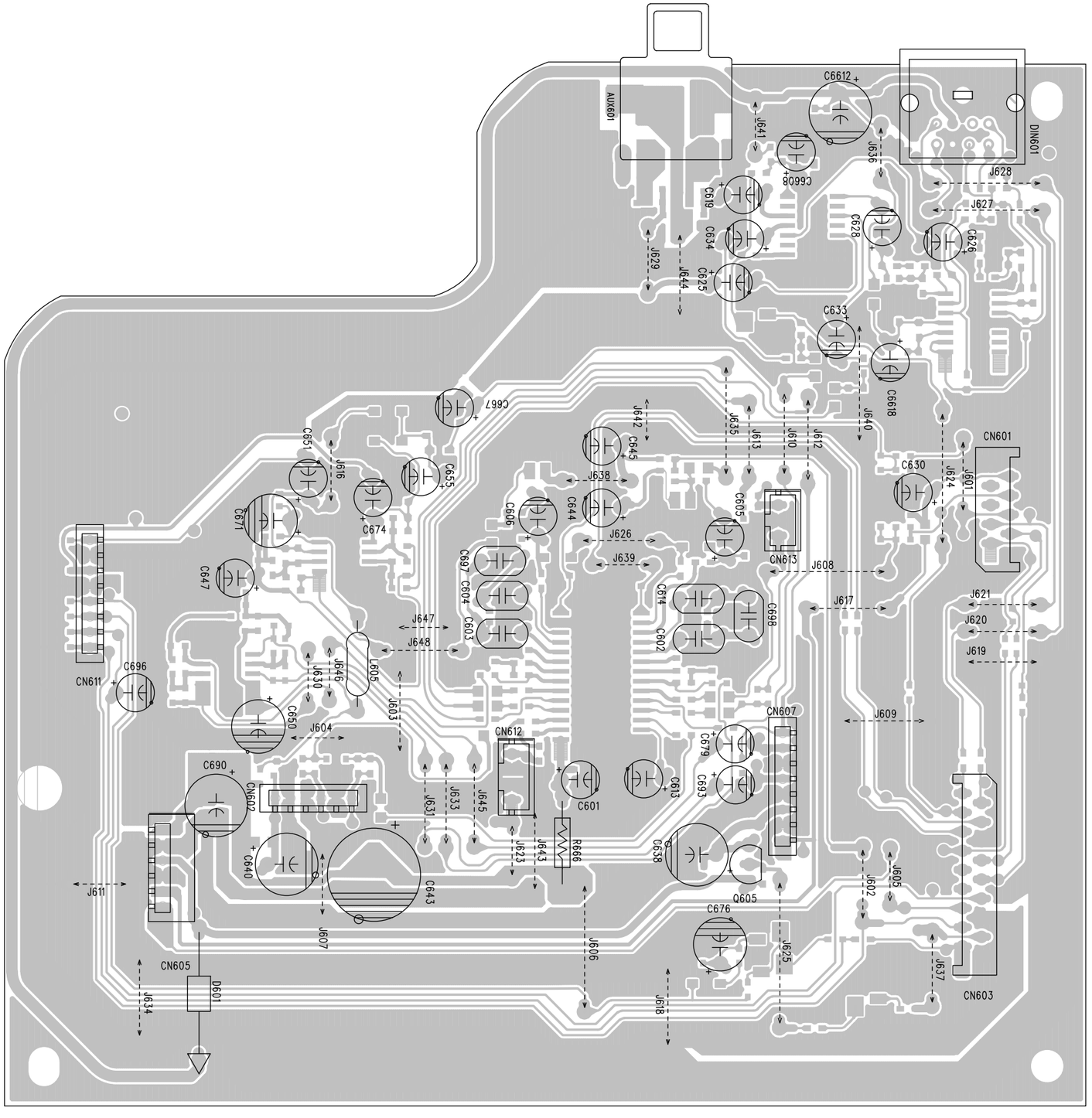
6-1

CIRCUIT DIAGRAM - MAIN BOARD



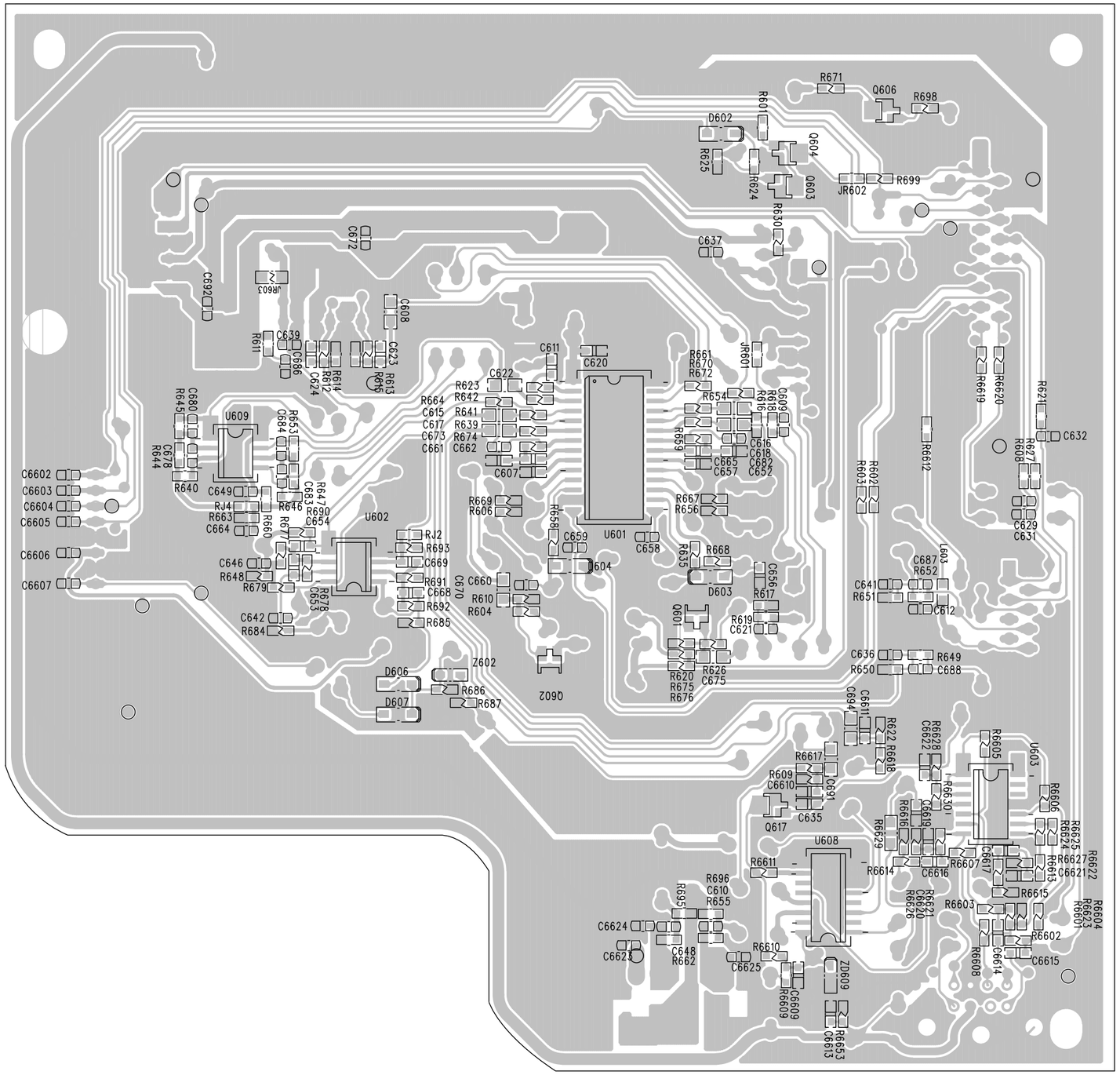
6-2

PCB LAYOUT - MAIN BOARD
TOP SIDE



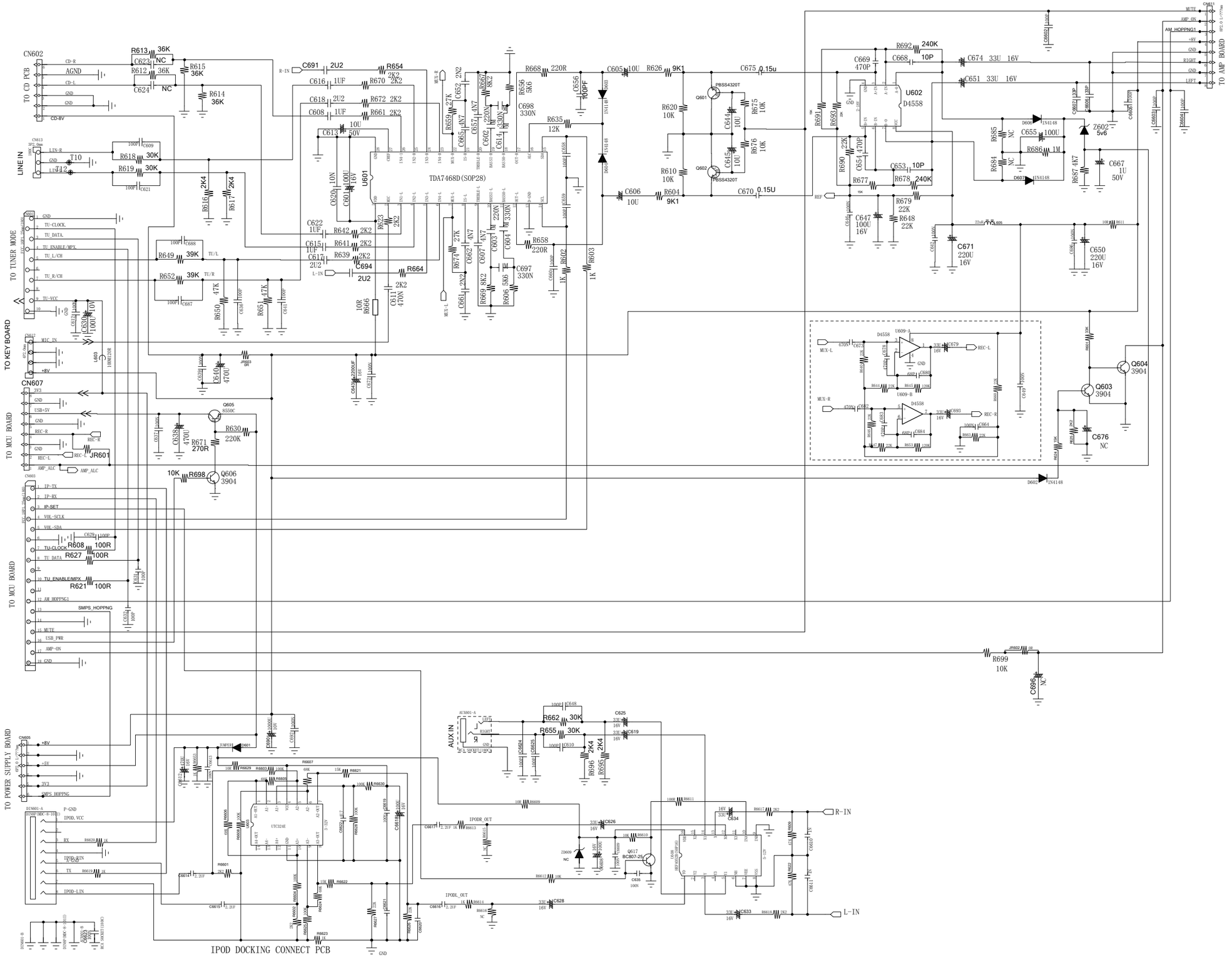
6-3

PCB LAYOUT - MAIN BOARD
BOTTOM SIDE



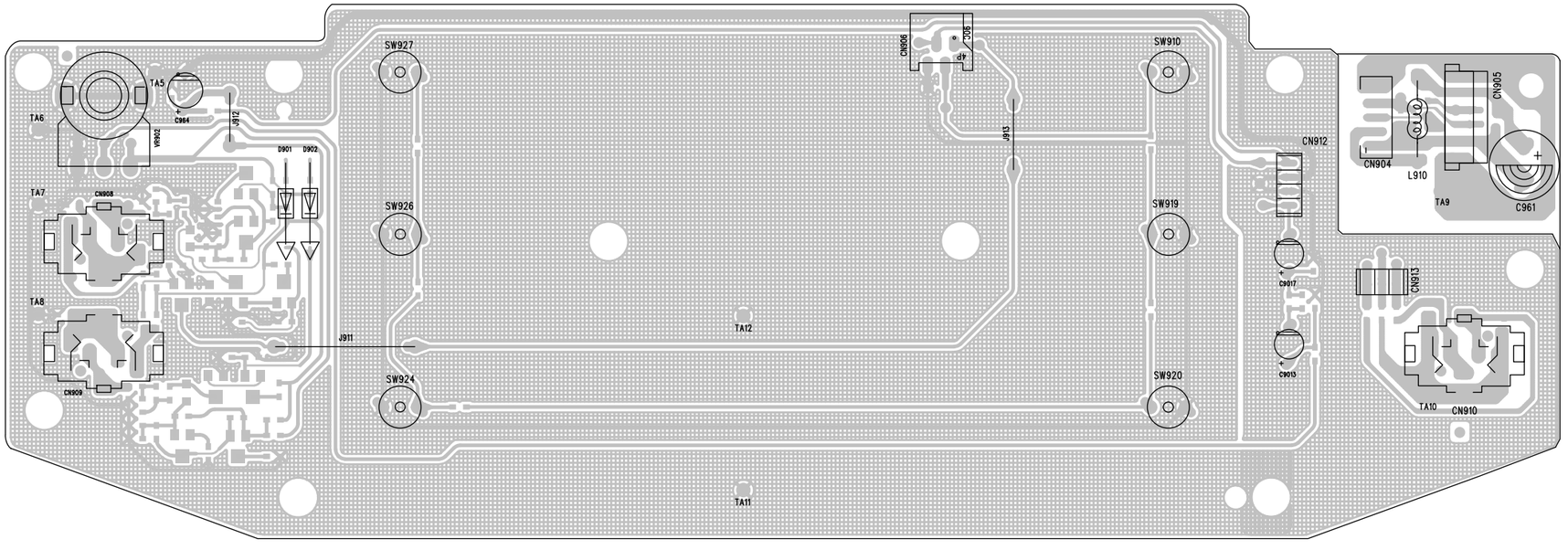
7-1

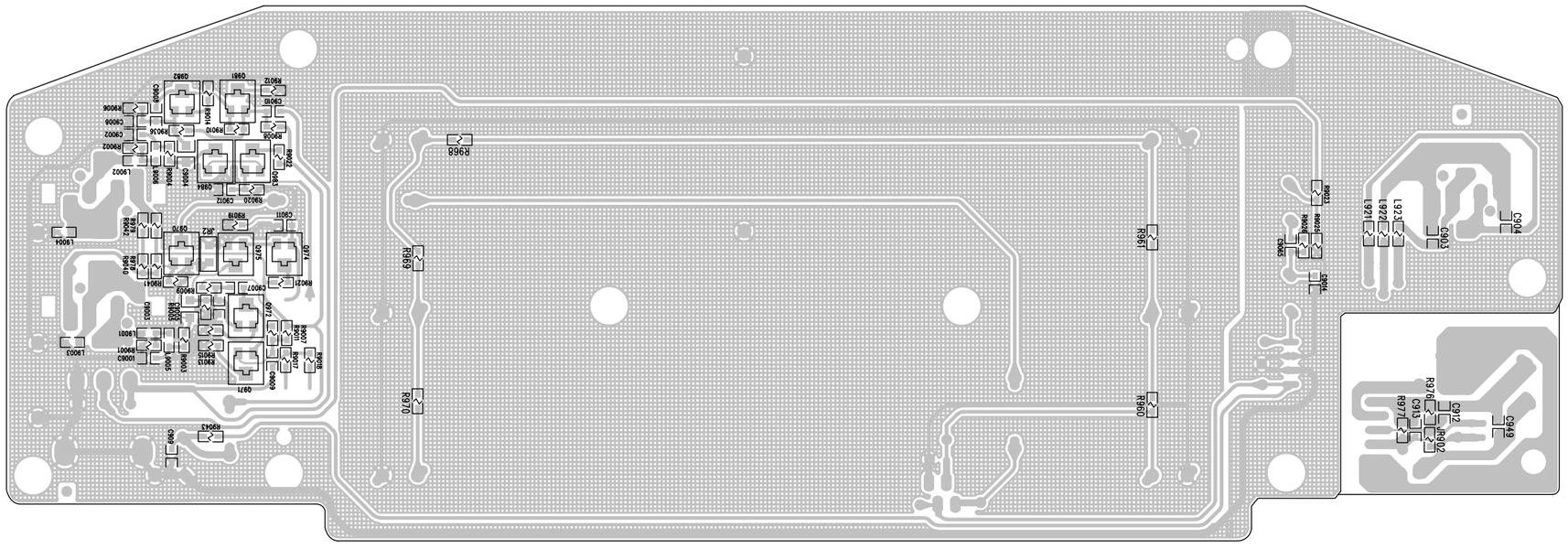
CIRCUIT DIAGRAM - KEY BOARD



7-2

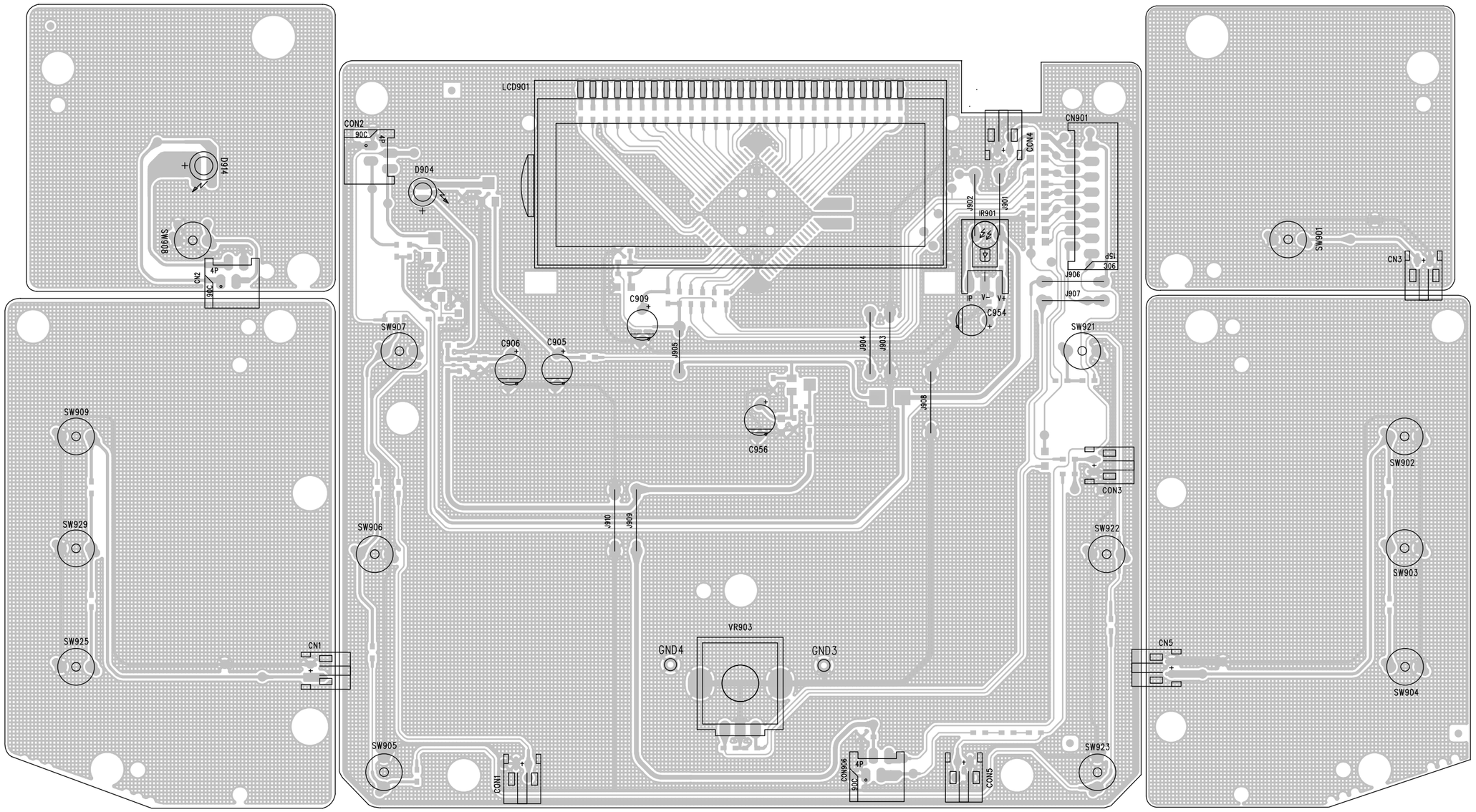
PCB LAYOUT - KEY/MIC BOARD





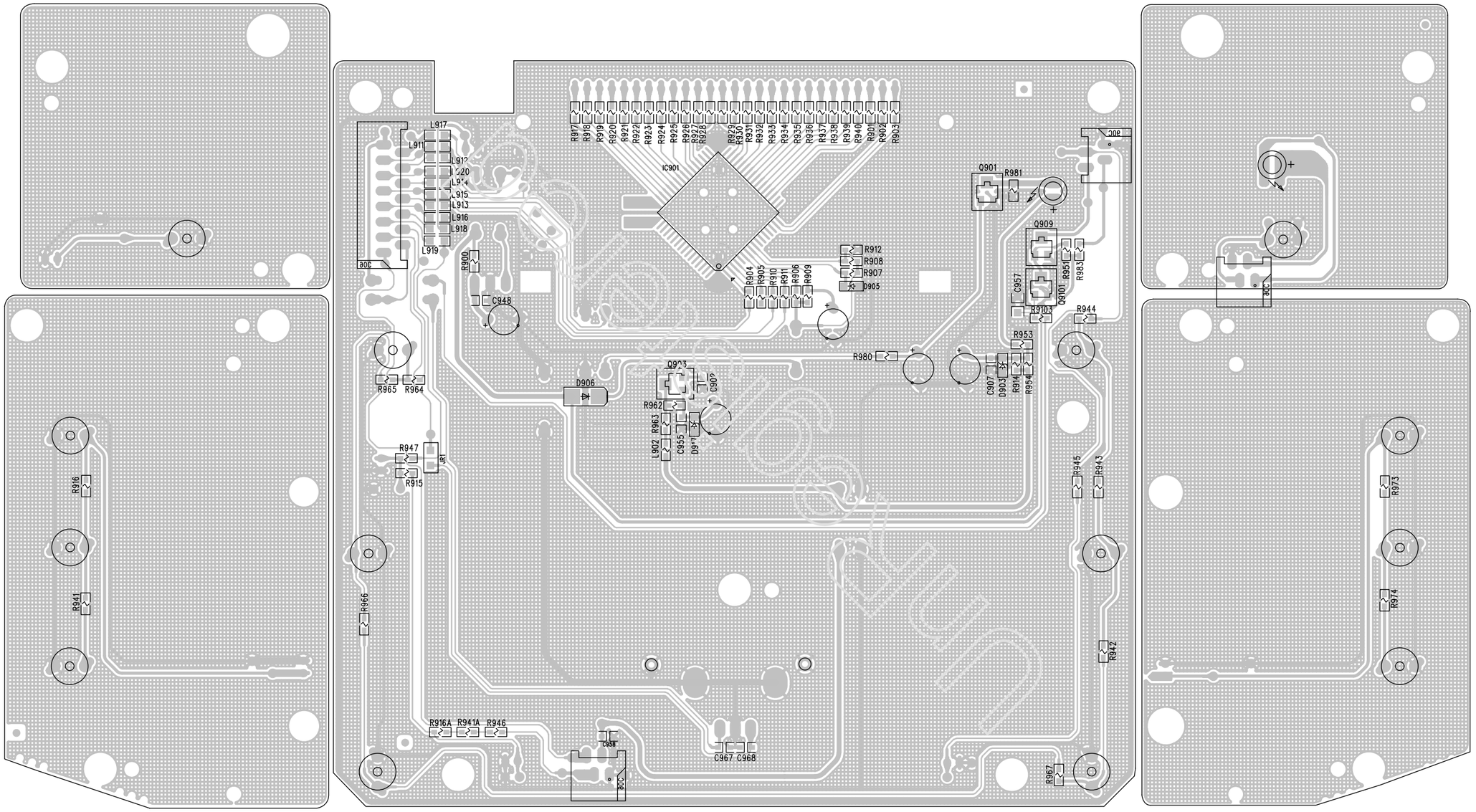
7-3

PCB LAYOUT - DISPLAY BOARD
TOP SIDE



7-4

PCB LAYOUT - DISPLAY BOARD

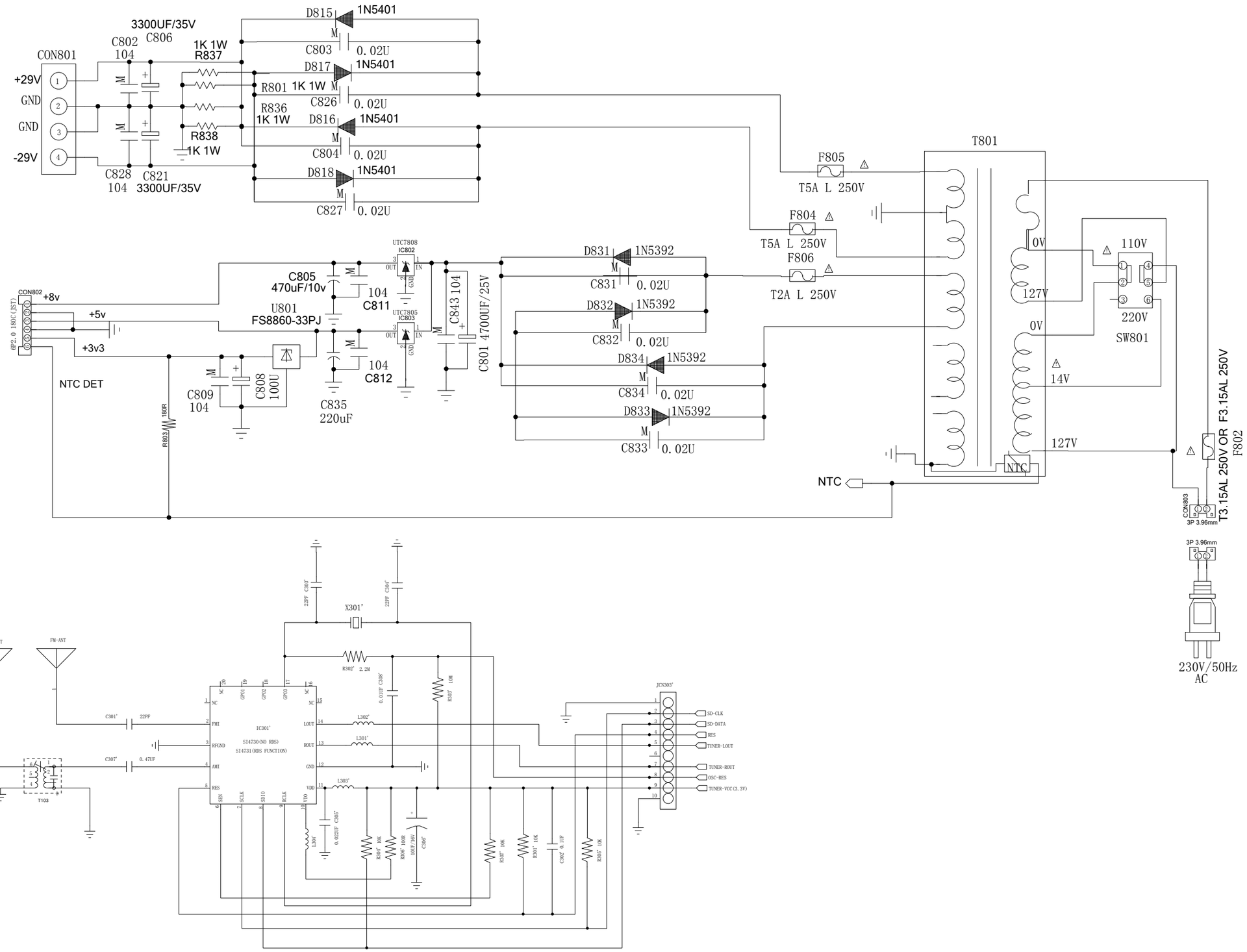


8-1

CIRCUIT DIAGRAM - AMP BOARD

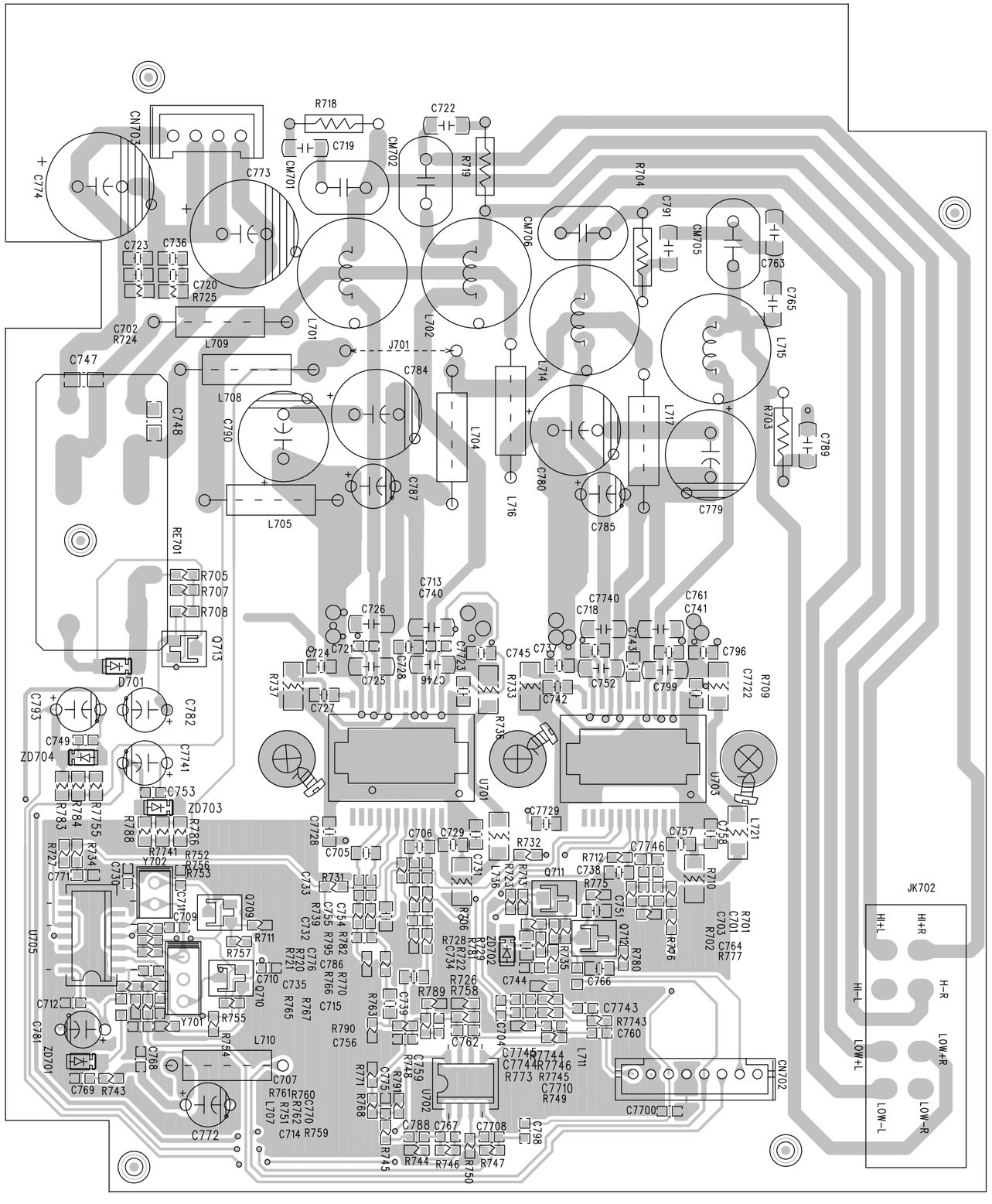
8-2

CIRCUIT DIAGRAM - TUNING/POWER BOARD



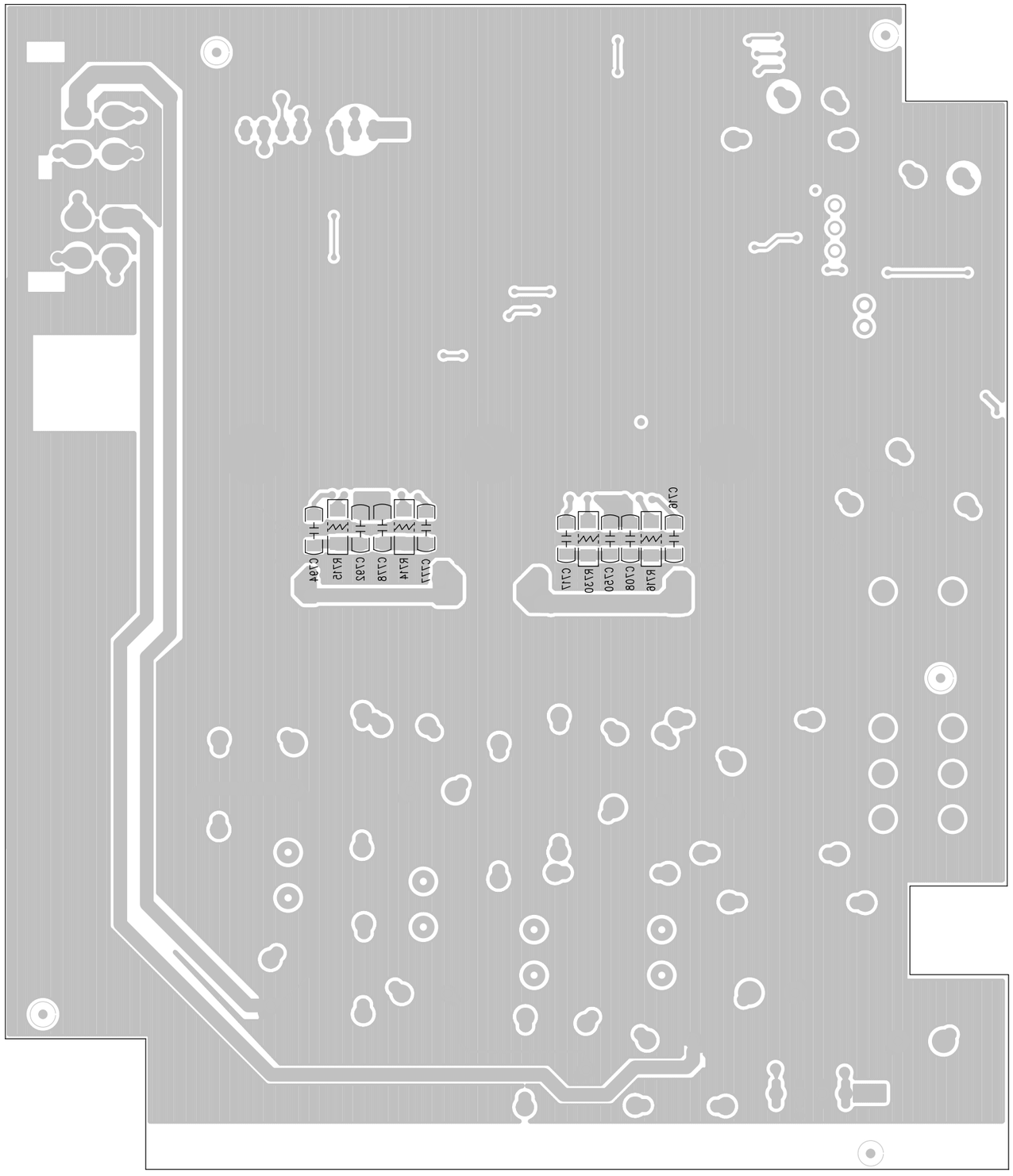
8-3

PCB LAYOUT - AMP BOARD
TOP SIDE



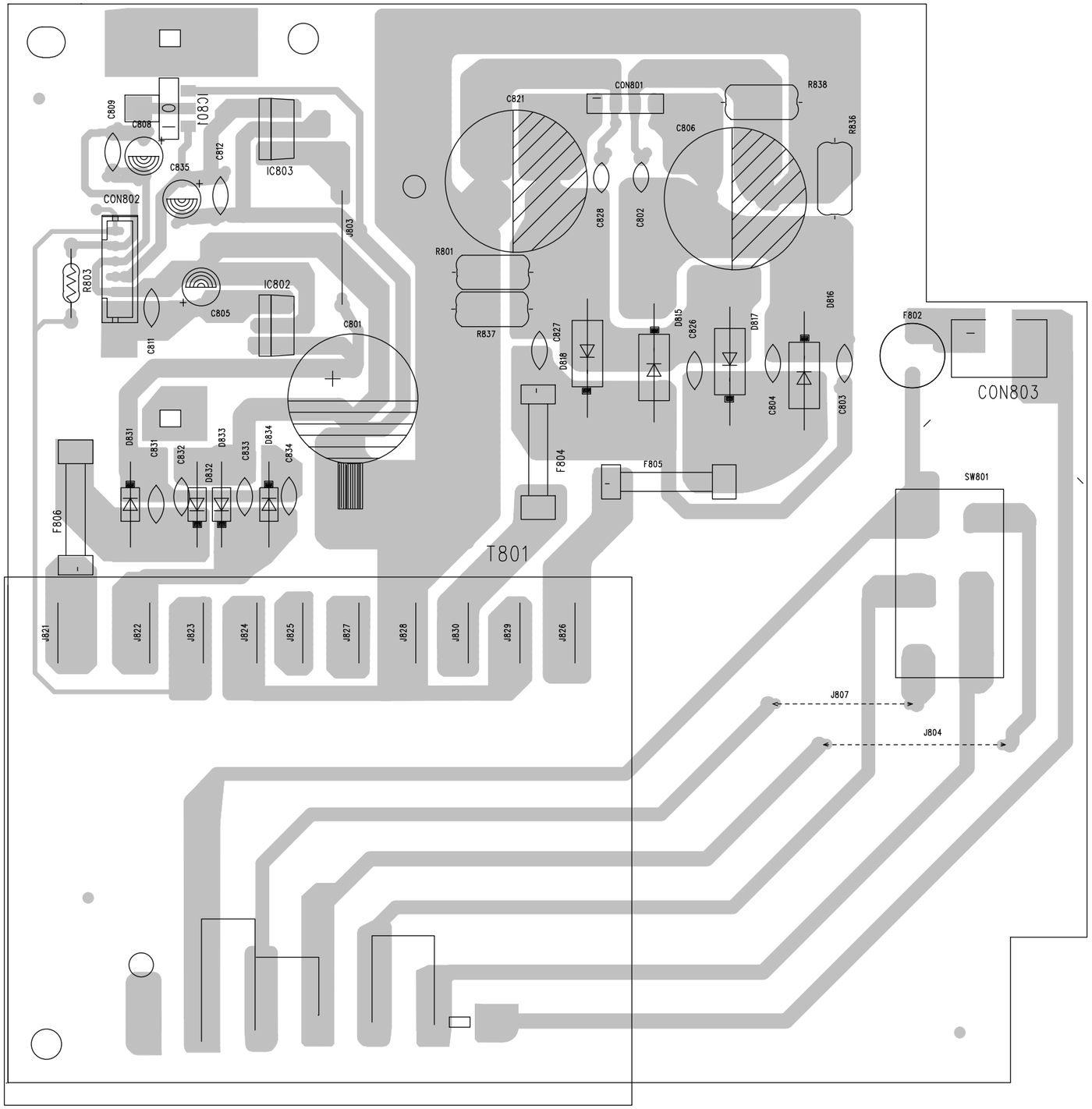
8-4

PCB LAYOUT - AMP BOARD
BOTTOM SIDE



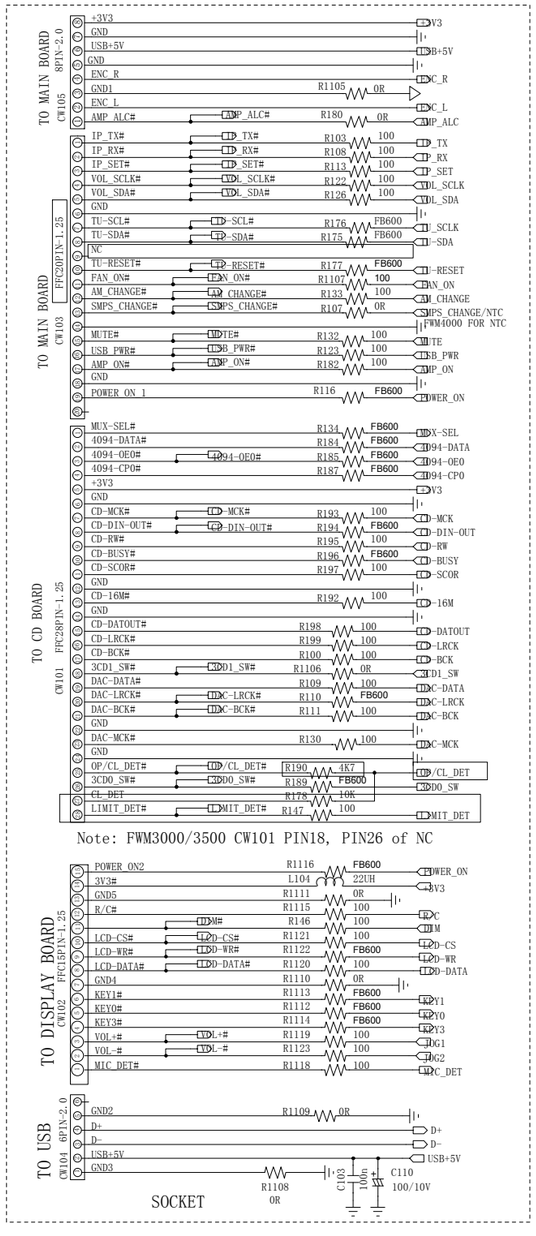
8-5

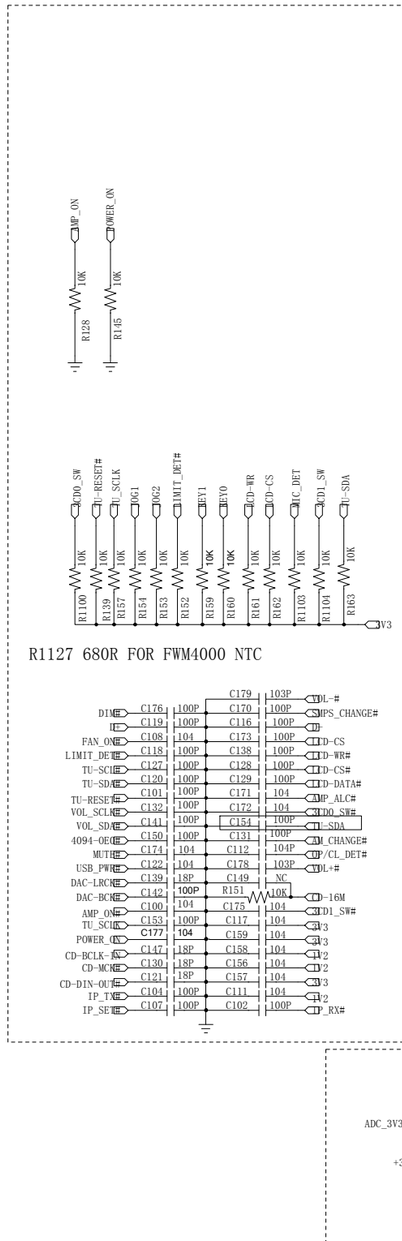
PCB LAYOUT - TUNER BOARD

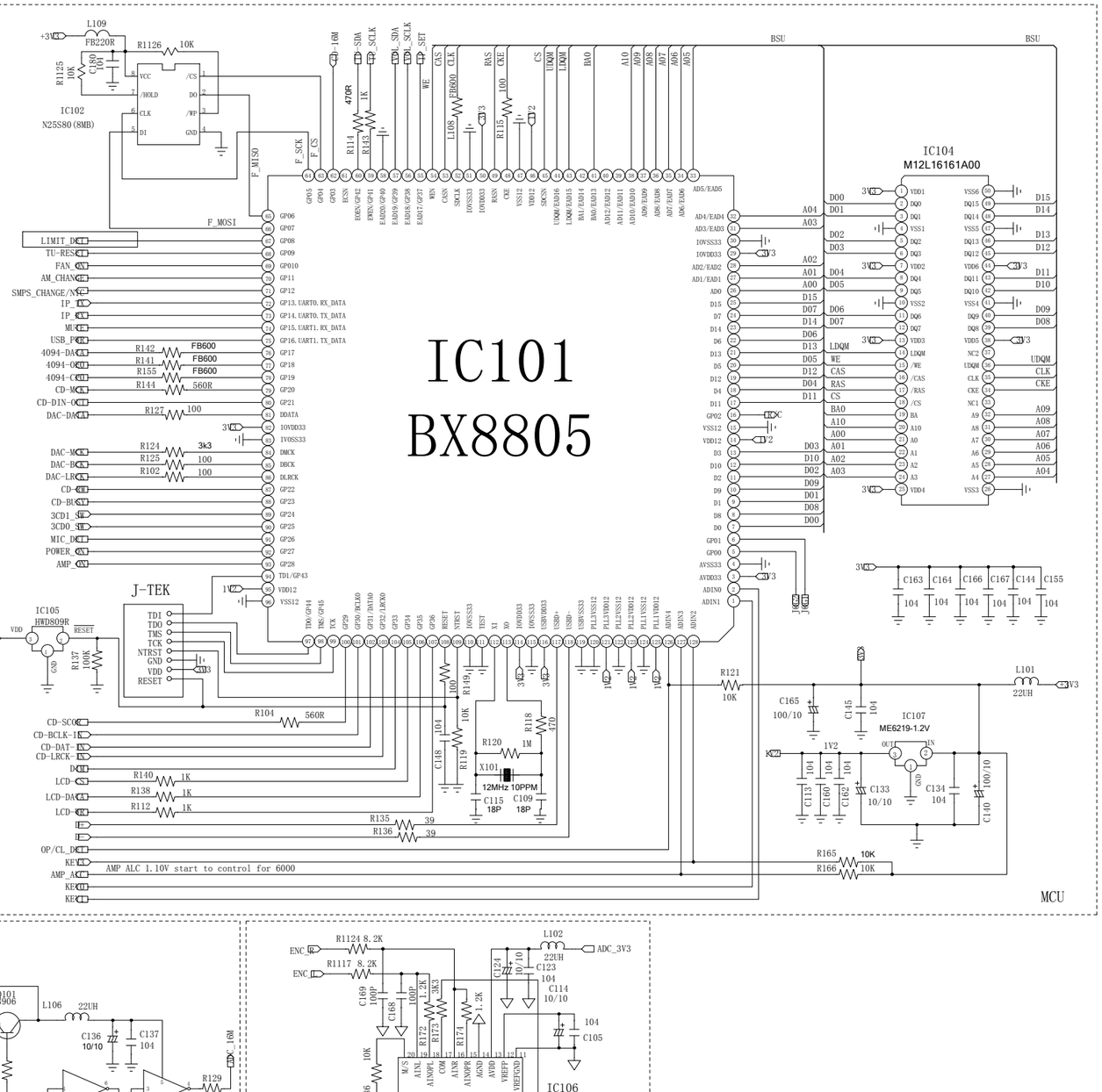


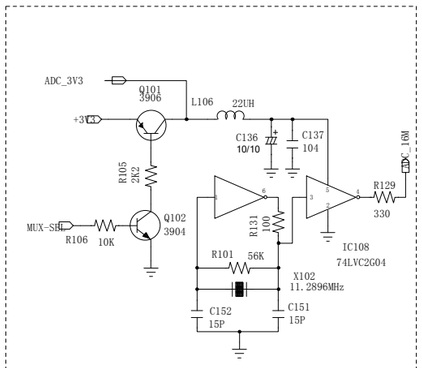
9-1

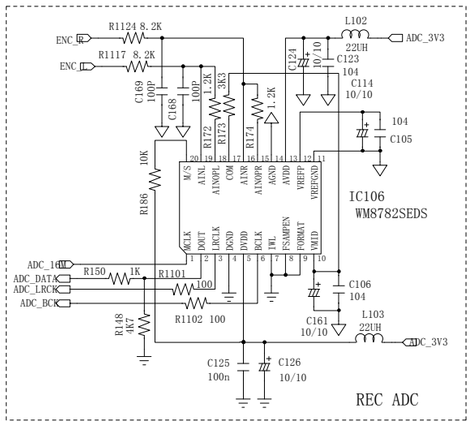
CIRCUIT DIAGRAM - MCU BOARD

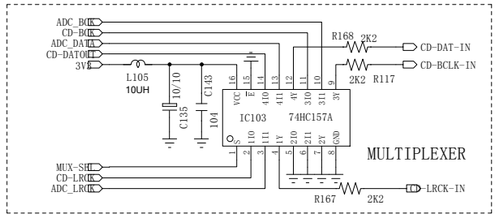






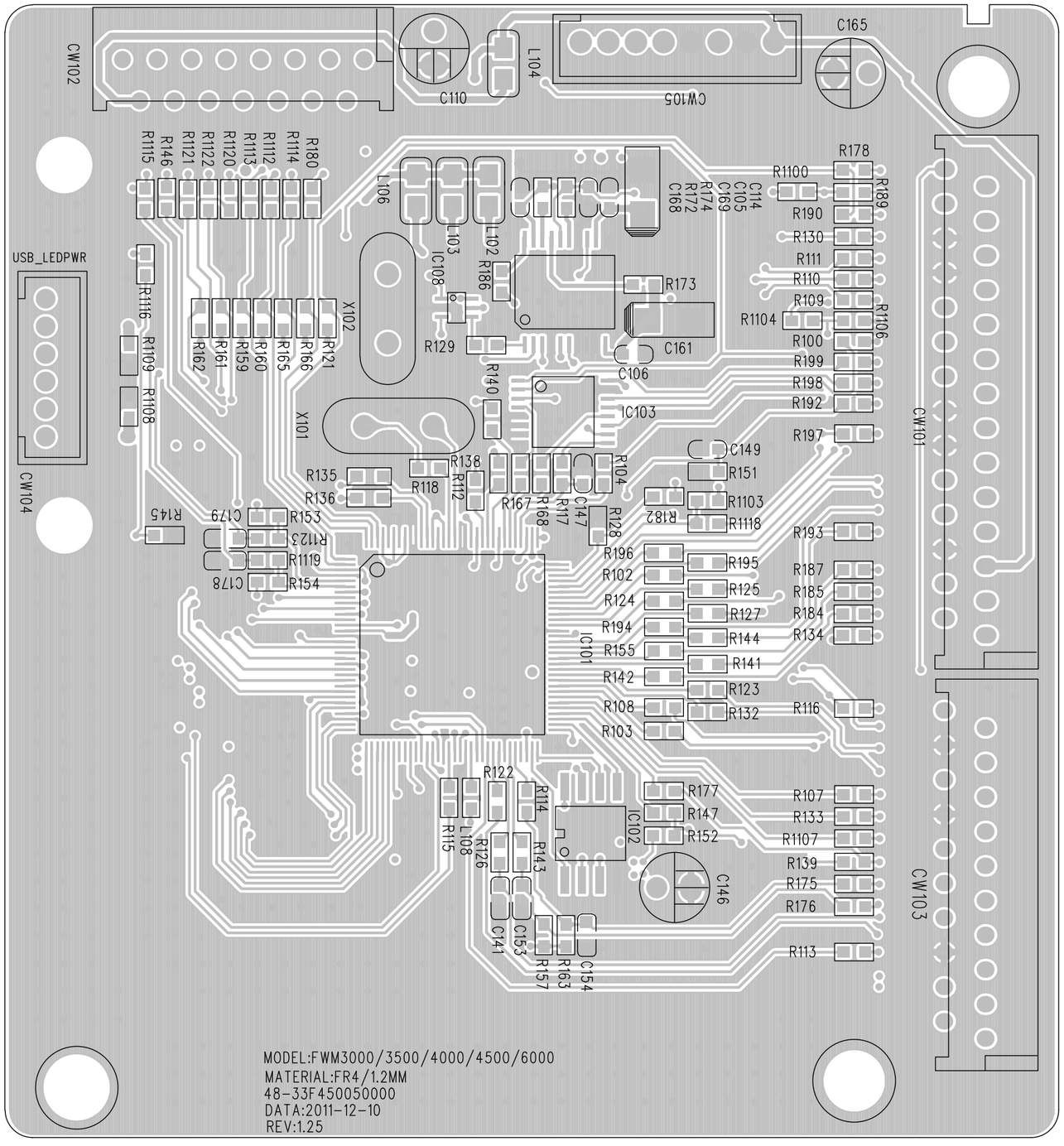






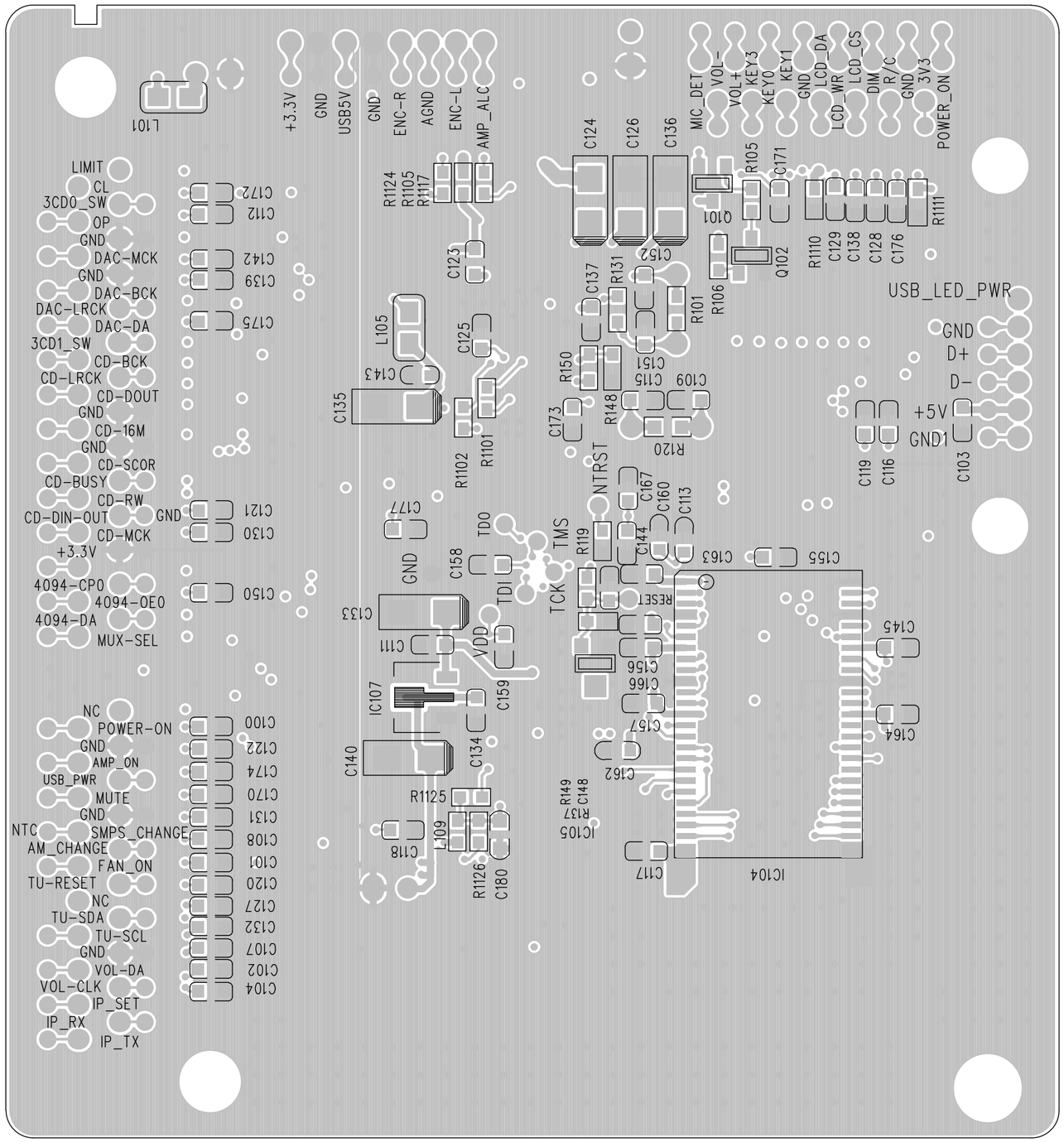
9-2

PCB LAYOUT - MCU BOARD
TOP SIDE



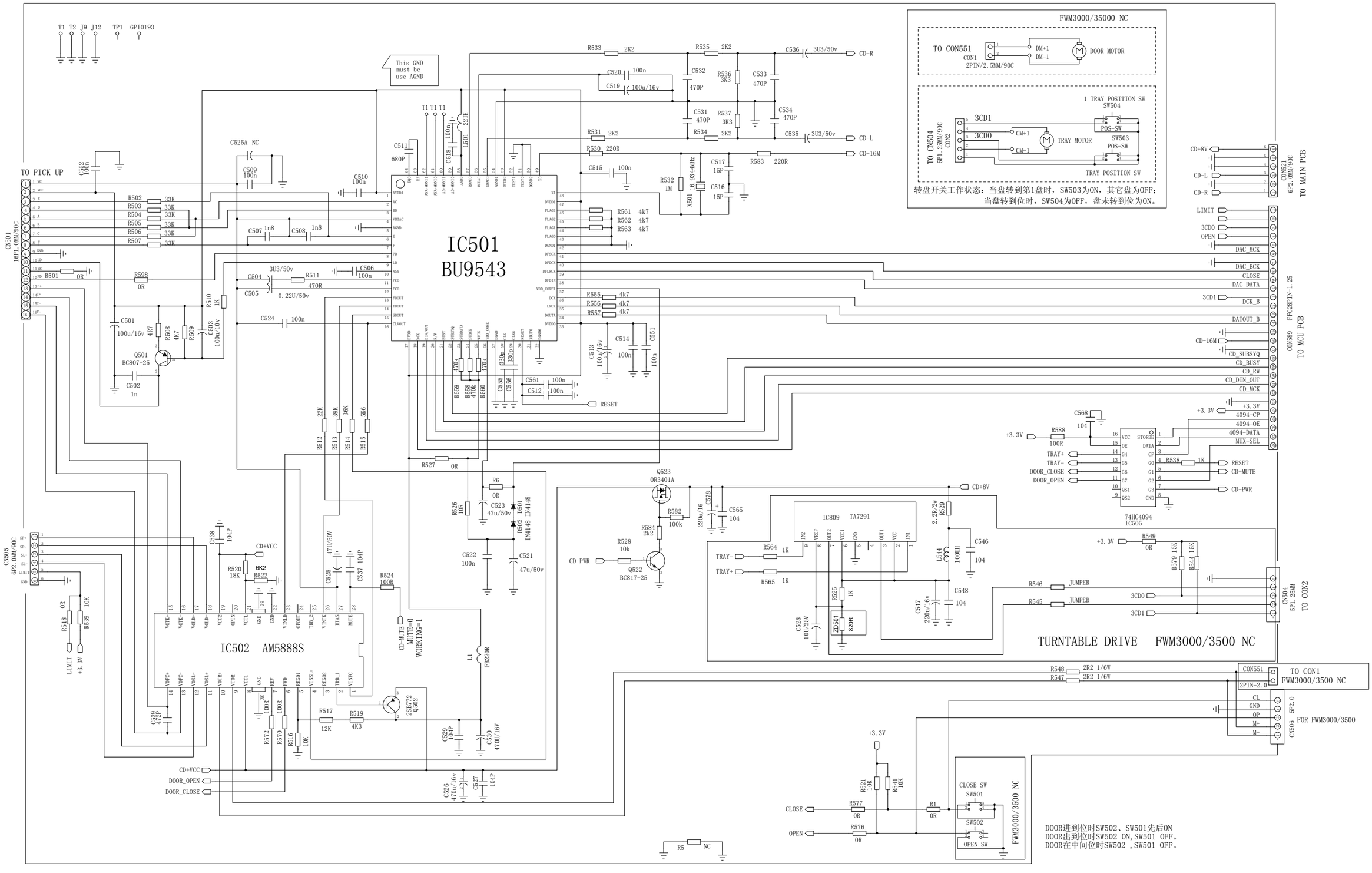
9-3

PCB LAYOUT - MCU BOARD
BOTTOM SIDE



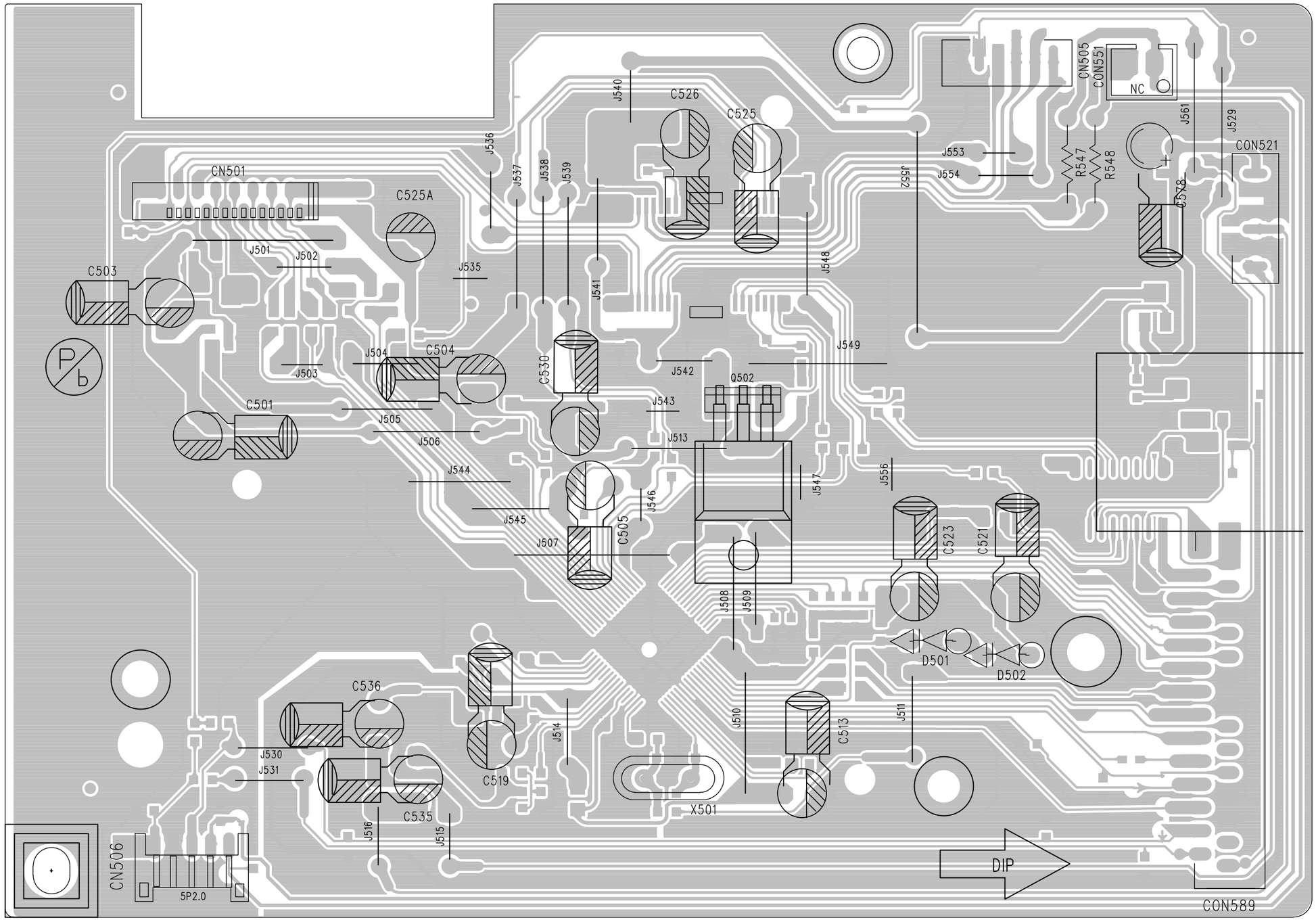
10-1

CIRCUIT DIAGRAM - CD BOARD



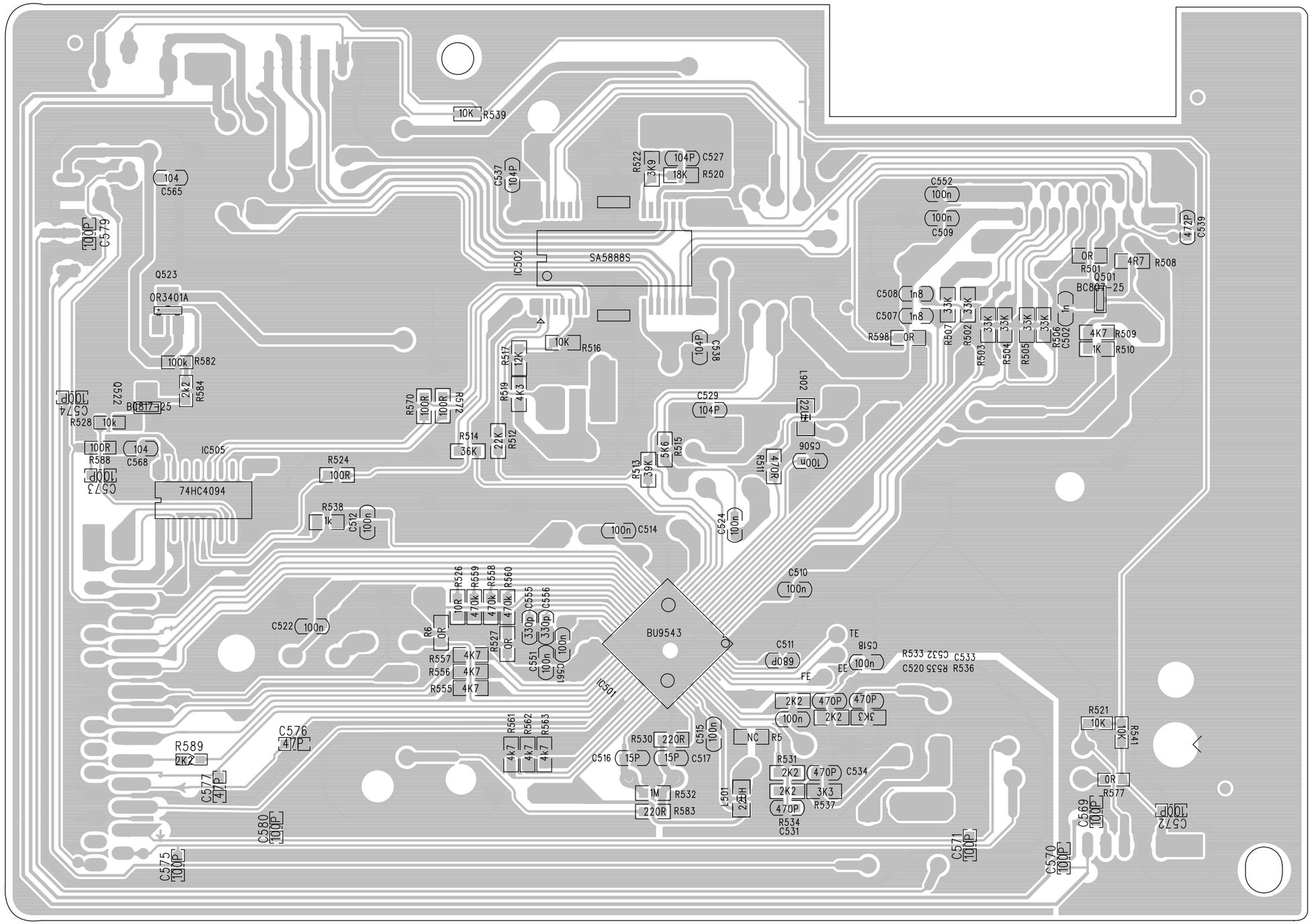
10-2

PCB LAYOUT - CD BOARD
TOP SIDE



10-3

PCB LAYOUT - CD BOARD
BOTTOM SIDE



11-1

EXPLODED VIEW