

Service
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Service Manual



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Version 1.0



PHILIPS

TECHNICAL SPECIFICATION

General description:										1
LIFETIME : 5 YEARS (ACC. TO UAN-D1611)										2
PERFORMANCE CLASSES :										
	TUNER	SUPPLY, AMPLIFIER	SPEAKER BOXES	RECORDER	CLOCK	CD	USB	TELEPHONE	REC. PLAYER	
I	x	x								3
II						x				4
III										5
SAFETY REQUIREMENTS:										6
EN 60065 (IEC 65) CE ,										
RADIATION, IMMUNITY REQUIREMENTS: (EMC)										7
EN55013, .EN55020 , (Version 55 approbation CB only)										
CLIMATIC REQUIREMENTS: (acc. to UAN-D1590)										
All climates: -10 °C till +50 °C (Functional); Set has to be pre-conditioned for 2 hour, except CD function										8
For all measurements: 25 °C										9
POWER SUPPLY:										
MAINS (AC) operation					DC (int. or ext.) operation / Backup Buffer					
Voltage selection:		See table below			Battery type:			10		
					minimum operating voltage :					
Selection:		See table below			Lifetime:			11		
Frequency:		See table below			External DC: No			12		
POWER CONSUMPTION:										
Power off mode: ≤5W typ. 3 W (power off mode)					Standby: 0nW (power off mode)					13
Maximum: 15 w					Maximum:					14
General:										
Q and R according to production division rules :					Q ≤ 1% (Major), Q ≤ 4% (Minor)					
Measured according to:					R ≤ 3% (CE52)					
DERIVED VERSIONS:									APPROBATION	
	Version	AC Voltage/ Frequency on type plate	Safety Tolerance	Tuner					Refer to version chart	15
	77	230VAC 50HZ	+/-15%	FM ,MW						
REMARKS::										16

TECHNICAL SPECIFICATION

TUNER PART

TECHNICAL description:

	AM	(circuitry)	FM	AM	(active components)	FM
RF				SI4831		SI4831
IF				SI4831		SI4831
Detector						
Decoder						

GENERAL part:

WAVE RANGE		TOLERANCES		TUNING STEP(mm/10kHz)
FM (77 version)	87 –108MHZ	LOW : +0.3/-0.3MHZ HIGH: +0.4/-0.4MHZ		0.025
AM (77 version)	520 –1710KHZ	LOW: +30KHZ /-30KHZ HIGH: +40KHZ /-40KHZ		

AERIAL:

MW Ferrite Bar : 60 mm /D 10mm	FM telescope : 430 mm	11
FM wire : N/A	Execution - N/A	12

INDICATORS:

Pointer stroke:	Execution pointer:	13
Knob indication over:	Field Strength:	14

ELECTRICAL DATA:

AM:	Nom.	limit	FM:	nom.	limit					
RATED OUTPUT POWER 10% THD 80%Mod 120dB	1W	-6DB	AM Suppression	30	25 dB					
			-3dB limiting point	12	18 dBf					
Amplification reserve	2	+/- 3dB	Amplification reserve	2	+/-2 dB					
AGC figure of merit	31	25 dB	AFC holding range (average)	300	+/- 150					
Distortion (RF 74 to 94 dBuV/m, m=80%)	5	7%	Distortion (RF 32 to 72 dBuV, mono Δf 100kHz, Stereo : 90% + 9%)	5	7 %					
			Stereo -46dB quieting	40	44 dBuV					
			Cross-talk (RF 1mV, Δf 40kHz, 400Hz /1kHz / 5kHz)	21/25/18	18/20/15 dB					
Strong S/N radio RF 94dBuV/m, m=80%	45	40	S/N radio (A-Weighted, RF 4mV)	53	50 dBA					
Channel difference	0	3 dB	Channel unbalance (250Hz to 6300Hz)	0	3 dB					
Modulation hum (30% mod)	45	40	Modulation hum (22.5kHz dev)	44	40 dB					
2, 3th IF harmonics rejection (RF 64 to 94dBuV/m)	21	18	8, 9,10 th harmonics whistle	35	30 dB					
Overall frequency response (-3dB)	60 1.5	120 Hz 1.3k Hz	Overall frequency response (+/- 3dB, 1kHz ref) - 50us -	70 12k	80 Hz 10k Hz					
Oscillator stop voltage			Oscillator stop voltage							
230V setting	190	192 Vac	230V setting	190	192 Vac					
Search tuning sensitivity	/	N/A	Search tuning sensitivity	/	N/A					
Search tuning stop accuracy RF ≥ α26 to 1mV RF ≥ 1V/m	/	N/A	Search tuning stop accuracy - 20uV ~ 20mV - 20mV ~ 500mV with step size = 50kH - 20mV ~ 500mV with step size > 50kHz	/	N/A					
Search time of total tuning range	/	N/A	Search time of total tuning range		N/A					
IF	45KHZ	± 3kHz	IF	218kHz	± 3kHz					
Frequency drift vs temp. -10°C to 10°C 10°C to 30°C 30° to 50°C	0.7 / 1000 * operating frequency		Frequency drift vs temp.	15KHZ/° C 10KHZ/° C 15KHZ/° C						
Dial calibration	5	7%	Dial calibration	-1.2	+/- 1.5MHz					
			Stereo On point (Pilot deviation : 6kHz)	14	15.5 dBuV					
			Switching on – 6dB							
wave range	Sensitivity for 50mW		noise limited sensitivity (26dB)	Image rejection	IF rejection	large signal	Selectivity S9/300kHz	bandwidthB+3dB		
FM	nom.		19	21	55	130dBf	21			
	lim.		21	19	50	125dBf	19			
MW	nom.		68	35	28	1000	21	3.0		
	lim.		72	28	24	500	16	>2.5		
unit	μV/m	μV	dBf	μV/m	dBf	dB	dB	mV/m	dB	kHz

REMARKS:

TECHNICAL SPECIFICATION

SUPPLY, AF-AMPLIFIER & LOUDSPEAKER PART:

TECHNICAL description:							
		Power supply	Tone Control	AF-Amplifier	Loudspeaker		
Active components				CD8227		1	
Passive components					2 X 1 W, 8ohm	2	
						3	
GENERAL part:							
Headphone type		None					4
Loudspeaker filter, high pass		None					5
Loudspeaker filter, low pass		None					6
Power stage protection		AC – NO; DC - NO; Temperature – YES; Short circuit – NO					7
Public address		No					8
INDICATORS:							
Output power or VU-meter		No	:	digits:		9	
Frequency response		No	:	digits:		10	
Low power (battery)		No				11	
ELECTRICAL DATA:							
TONE/EQUALIZER/DBB							
				Balance control	No	12	
				Mechanical noise (ISO 1996)		13	
				Noise overall (ISO)		14	
				Channel difference at 50mW		15	
				Hum (vol.max.-20dB to vol.min.)	Limit: 200 nW	16	
				Residual noise (volume minimum)	Limit: 260 nW	17	
Input sens.: Nom.				500mV	mV		
for 50mW Limit:					mV		
Line outp.: Nom.					mV		
voltage Limit:					mV		
OUTPUT POWER:							
Mains operation:	D=10%	2 X 1W		Limit: - 1dB		18	
Battery operation:	D=10%	2 X 1W		Limit: - 1dB		19	
Music power (MPO) / Peak-MPO (PMPO):				(acc. to DIN45324)		20	
Short term maximum output power:		-		(acc. to IEC 60268-15)		21	
Long term maximum output power:		-		(acc. to IEC 60268-15)		22	
Headphone output voltage/power:						23	
Bandwidth FTC – 1dB at:		n.a.		(acc. to FTC/16/1/D/432)		24	
Bandwidth DIN – 3dB at:		-		(acc. to IEC 60268-15)		25	
Frequency response at Vol. max – 20dB:		typ. 60Hz to 16kHz (±3dB)				26	
DBB raise level				Disc SBC429 Track 12			
LOUDSPEAKER (output):							
Low pass crossover frequency:		-	kHz	tolerance:	Hz	27	
High pass crossover frequency:		-	kHz	tolerance:	Hz	28	
Short term maximum output power:		-	W (acc. to IEC 60268-15)			29	
Long term maximum output power:		-	W (acc. to IEC 60268-15)			30	
Frequency response at:		-	Hz		kHz	31	
REMARKS:							
27 : Measured in Tuner mode; 28: CD or LINE IN mode.						32	

TECHNICAL SPECIFICATION

CD-PART: (SANYO DA11B3VF CD MECHANISM) (BALL type)

Technical description:					
	Input	Output	Motor/control	Logic control	1
Active components				TC94A77FG-203	2
Passive components					3
	Signal processing	D/A converter	HF-preamplifier	Servoprocessor	4
Active components	CD: TC94A77FG-203	CD: TC94A77FG-203	D9258PH		5
Passive components					6
Indicators/Display/Keys:					
Display: LCD for Track No. display 3 Digit					7
Keys: Slide switches & tact switches					8
Playability: (acc. to AHR-82-Gbu-00-4201)					
	Limit	Typical	Testdisc		9
Wedge	600 μm	900 μm	TNO 7,9 of SBC 444A (7104 099 24990)		10
Eccentric	150 μm	200 μm	TNO 1,24 of 200μm disc (7104 099 24960)		11
Fingerprint	No audible defect		TNO 11 of Subchassis 8A		12
Black dot	500 μm	600 μm	TNO 13, 14 of SBC 444A (7104 099 24990)		13
Double black dot	No failure		TNO 9 of Subchassis 8A		14
Skew 0.6 deg. 8cm	No audible defect		TNO 1,6 of 0.6deg C, 8cm skew disc		15
Bad HF track	No audible defect		TNO 8 of Subchassis 8A		16
Heavy fingerprint	No track jumps/plops		TNO 10 of Subchassis 8A		17
Maximum diameter	No audio effect		Last TNO of Subchassis 8A		18
Thick disc	No failure		Thick test disc		19
Thin disc	No failure		Thin test disc		20
Vertical deviation disc	No failure		TNO 1,16 of ABEX TCD-732RA (VDD +/- 0.5mm)		21
Playback position	Horizontal, Normal position (Set is located on a flat surface, floor)				22
- Playback of above mentioned tracks possible without track loss or audible defects.					23
- This unit can playback CD-R or CD-RW discs.					
Shock resistance: (acc. to AR 13-A6-CD-068)					
± Z axis	5 G				24
± X or Y axis	5 G				25
Acoustical noise:					
Mode: Play/Pause	35 dBA max. (45 dbA in Search mode)				26
Mode: Jump (Next)	45 dBA max.				27
Acoustic feedback:	Acoustical feedback is not allowed.	Test disc TNO 2,6,11,18,19,20 of SBC444 , 10% THD o/p , DBB on			
AUDIO part: (Measured with Audio Signals Disc-1, 7104 078 04911 on Speakers or Headphone socket with nom. load)					
	Typ.	Limit			
Output level (TNO1)	2.85V				28
SNR unwt'd.	60 dB	50 dB			29
SNR wtd. dBA	62 dBA	57 dBA			30
Crosstalk (1kHz) TNO 67, 71	35 dB	30 dB			31
Crosstalk (other range) TNO 66 – 73 (16 TO 16kHz)	35 dB	30 dB			32
Frequency response Vol.max.–20dB (DBB on)	-1.5dB -1dB	±3dB	at 80Hz		33
Frequency response at DBB off (+/- 3dB)	80Hz 12.5k	100 Hz 10 kHz			34
THD (1kHz, 0 dB)	1%	1.5 %			35
THD (overall frequency response range, 0dB)	2 %	3 %			36
Channel difference	0.5 dB	2 dB	Residual Noise Volme Min	1.8MV	37
Frequency accuracy	-	+/-0.5 %	Hum Volme Min	1.8MV	38
De-emphasis	75μs / 50μs Switchable via Subcode information				39
REMARKS:					
- Amplification reserve for CD = +2dB (±2dB); Ref. Level for CD is a 1kHz, -6dB (Audio signal disc 1, track 35)					40

TECHNICAL SPECIFICATION

CD-RW /MP3 Test discs :							
(A)	Audio signal disc 1			(N)	MP3CD-1.0B Multi-Purpose		
(B)	SBC444A			(O)	MP3CD-MS-1.0B Multi-Session		
(G)	Burn-in SBC 442			(P)	MP3CD-MX-1.0B Mixed Mode CD		
(K)	Printed CD-RW			(Q)	MP3CD-XA-1.0B CD Extra		
(L)	Low reflect CD-RW			(R)	MP3CD1.0D		
(M)	High reflected CD-RW			(S)	MP3CD-M400-1.0A		
				(T)	MP3CD-Multiformat-1.0B		
	Description	condition (test disc)		Noraml	limit		
CD-RW playability							
1	Fingerprint	“K” TNO 18		No audible disturbance			
2	Black dot	“K” 13, 17	um	800	400		
3	Low reflection	“L”		No audible disturbance			
4	High reflection	“M”		Startup			
MP3 playability : See specification on CD-DA							
MP3 - Data-format-check							
Remark :support ISO-9660, Joliet format and UDF 1.0 & 2.0							
1	File format check	Html file of “N”		File in non supported formats are skipped.			
2	Sample rate check	“N”		No audible disturbance			
3	Bitrate check 32,40, 48, 56, 64, 80, 96, 112, 128, 160, 192, 224, 250, 320 kbps, VBR (variable bit rate)	“N”		No audible disturbance			
4	Multisession	“O”		All titles accessible, no audible disturbance			
5	Iso9660	“N”		All titles accessible, no audible disturbance			
6	Playlist m3u			Not supported			
7	Id3 check	“N”		Not supported			
8	CD-Extra (1 audio session + 1 digitalsession)	“Q” Remark : selectable by mode button		No audible disturbance.			
9	Direct CD	“R”		No audible disturbance			
10	Mixed CD	“P”		No audible disturbance			
11	AAC-playback			Not supported			
12	WMA-playback			supported			
13	Max. titles / directories	“S” max. 350 titles and directories, avg. length of filename/foldername is 20 characters		All titles accessible, no audible disturbance.			

2.0 SAFETY 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 enfilez 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 kann 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 ridotta 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.

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

(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 utilisés les pièces de rechange identiques à celles spécifiées.

(GB) Warning !

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

(D)

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

(S) Varning !

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

(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.

(SF) Varoitus !

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

"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."

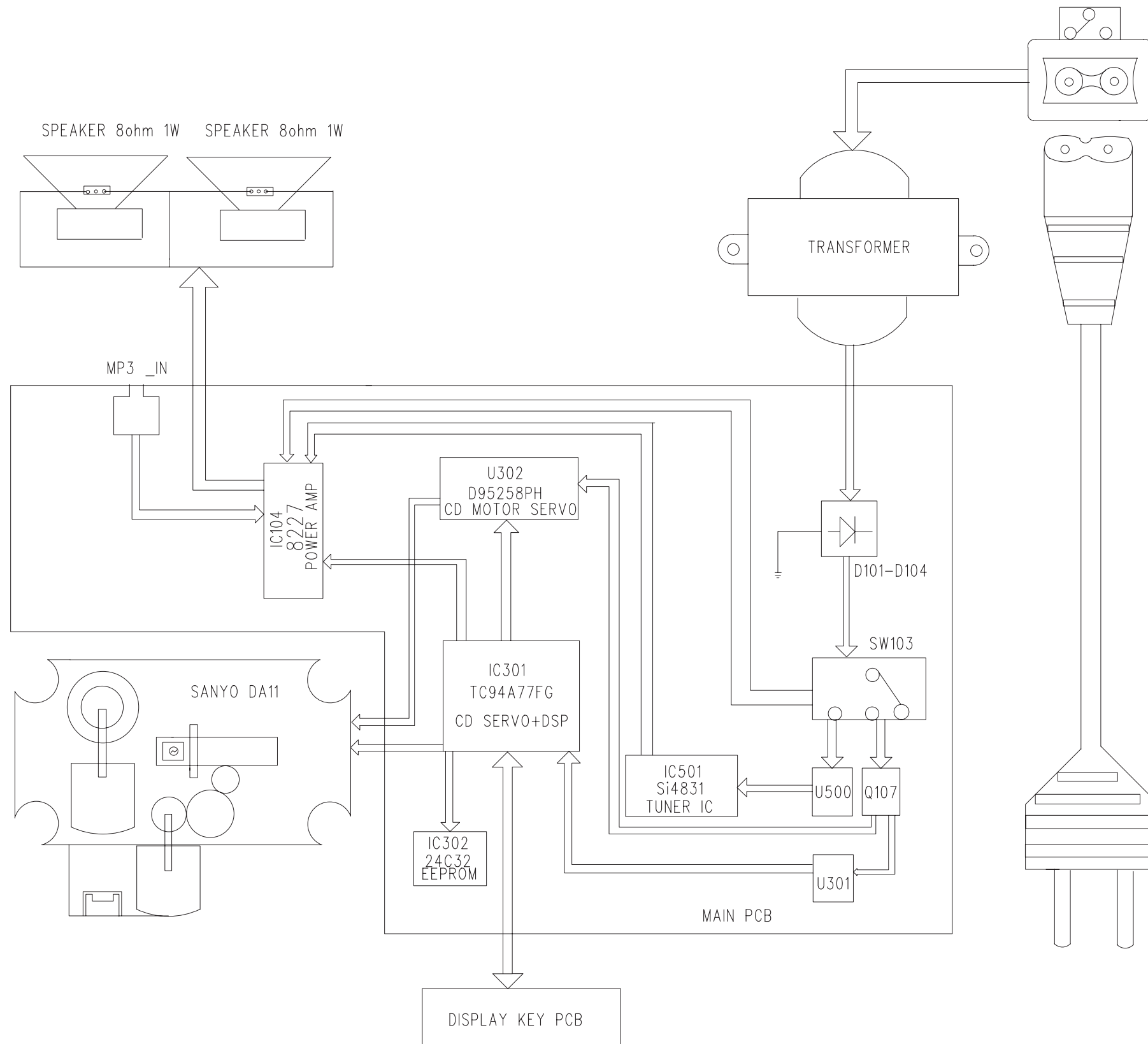
DK Advarsel !

Usynlig laserstrålning ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for strålning.

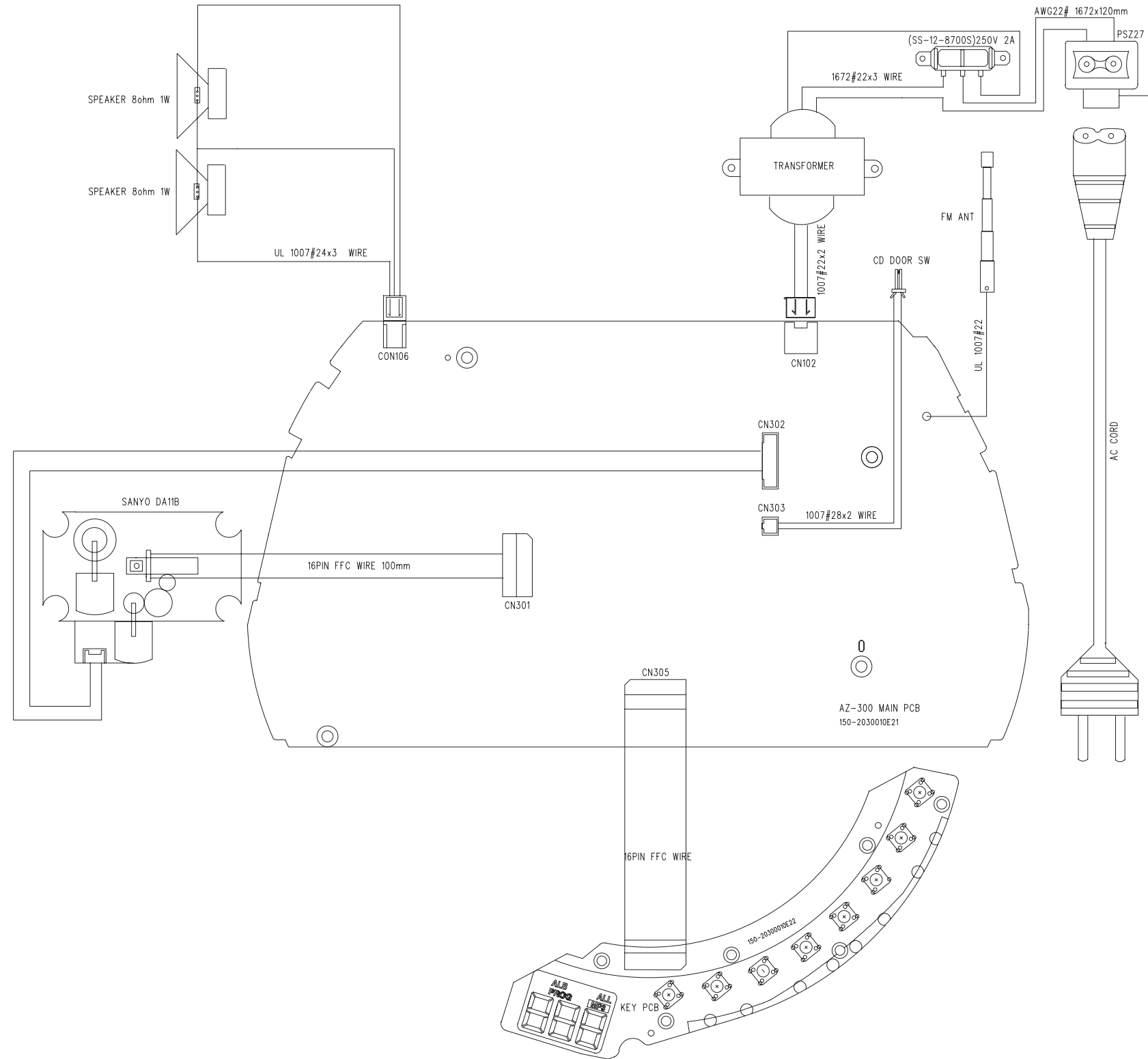
Caution: These servicing instructions are for use by qualified service personnel only.

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.

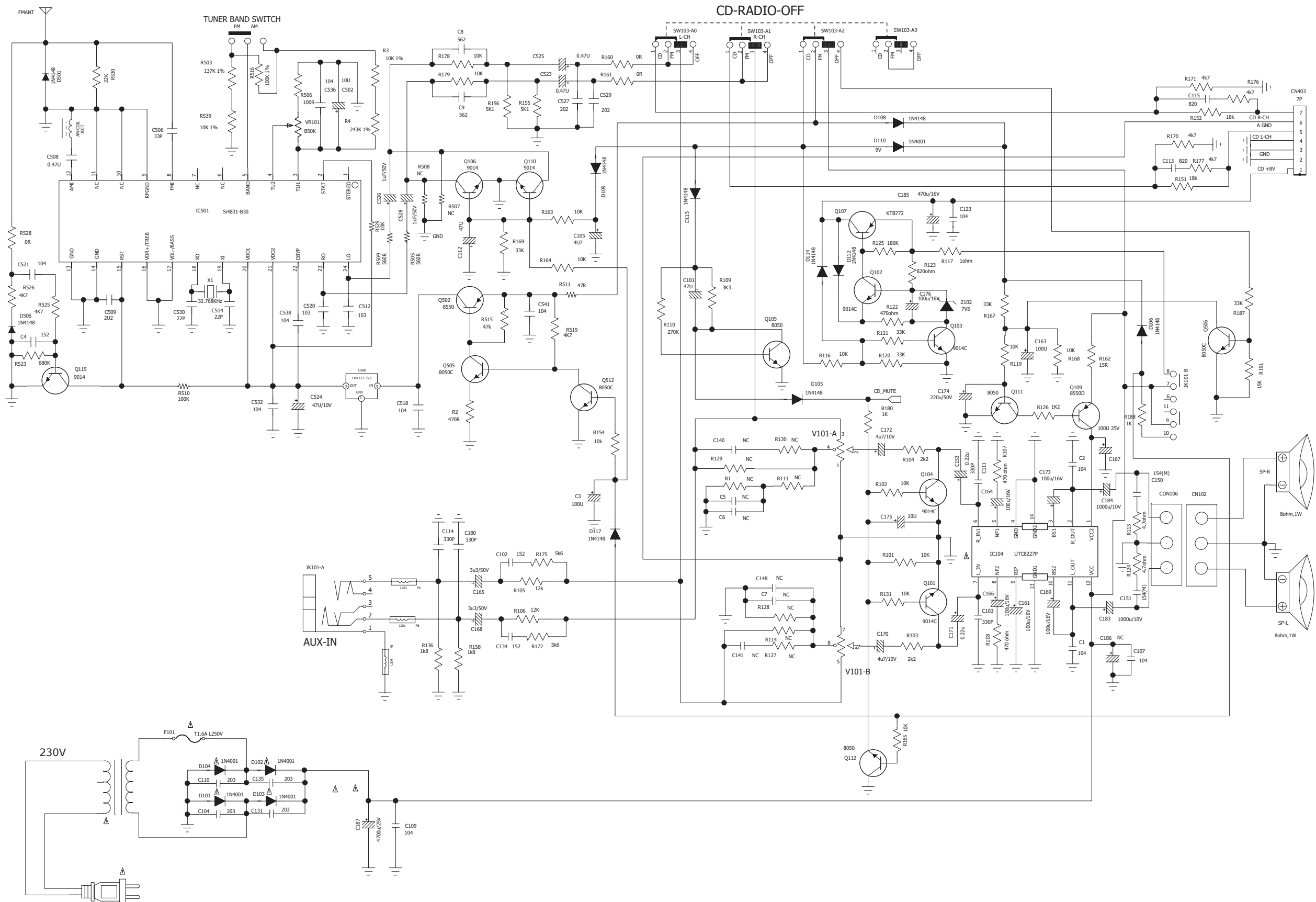
SET BLOCK DIAGRAM



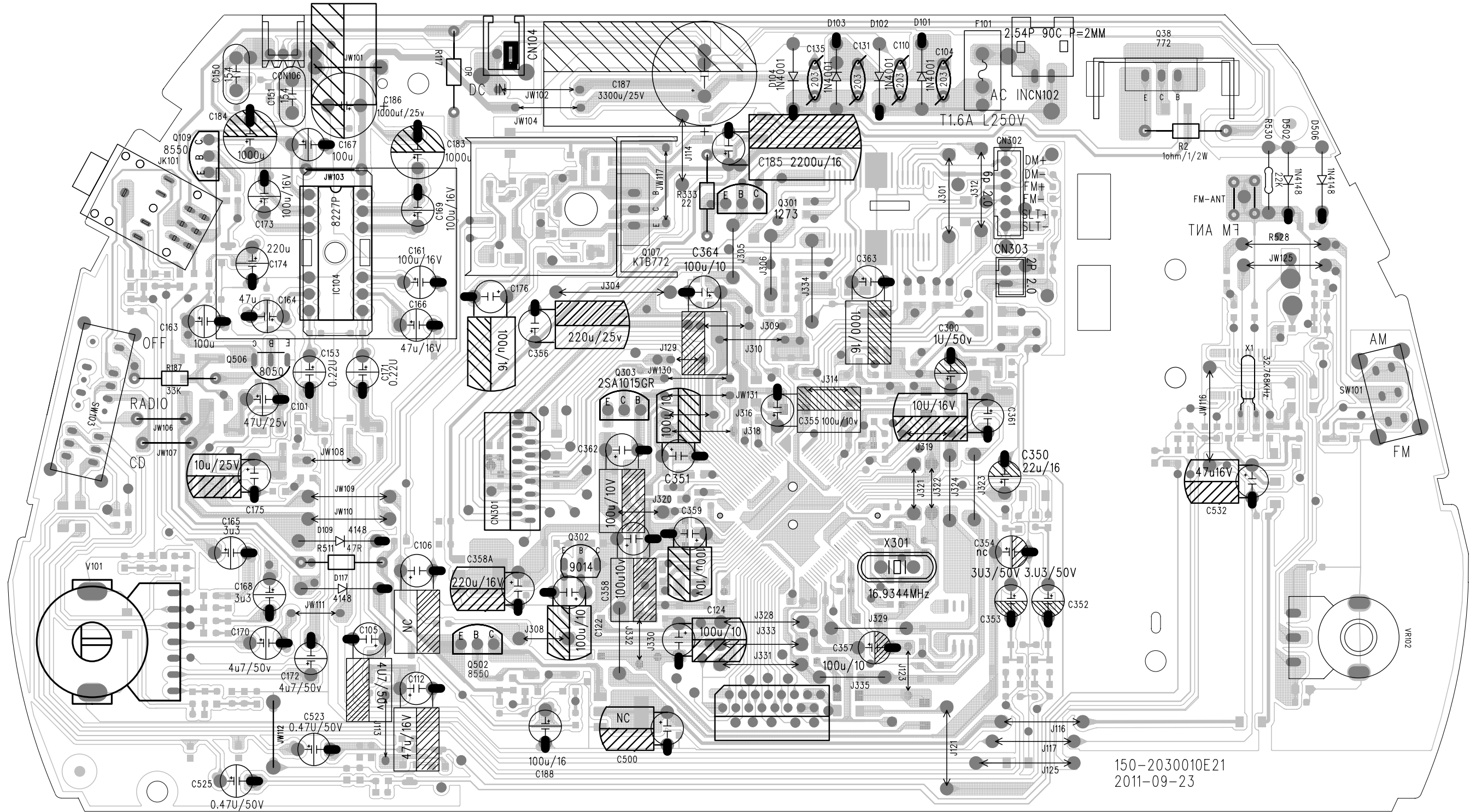
WIRE CONNECT DIAGRAM



CIRCUIT DIAGRAM -MAIN BOARD PART 2

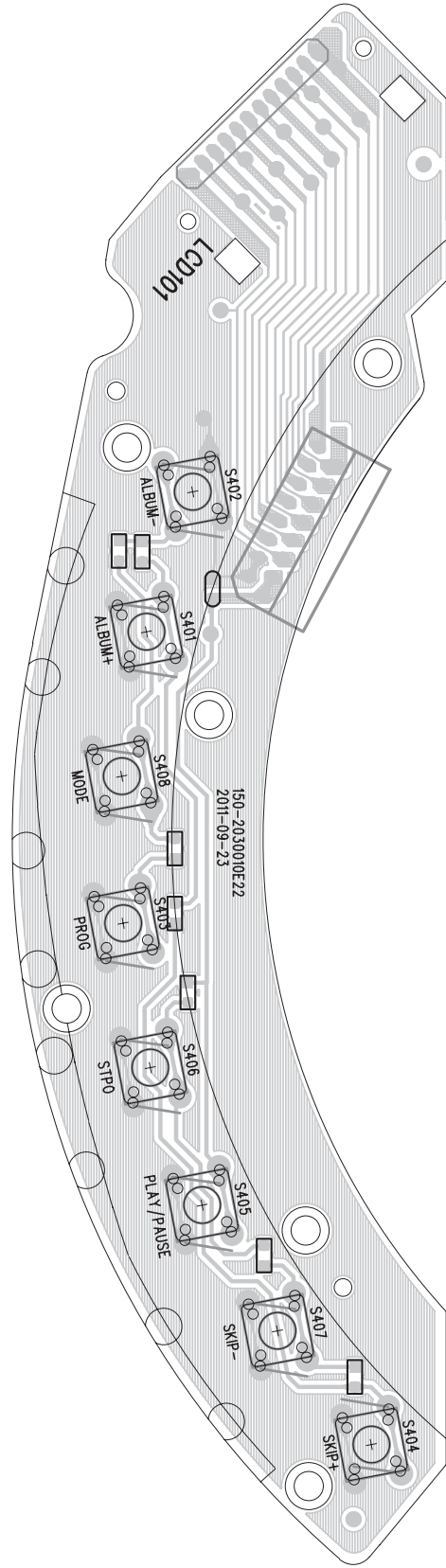


LAYOUT DIAGARM -MAIN BOARD
TOP SIDE VIEW

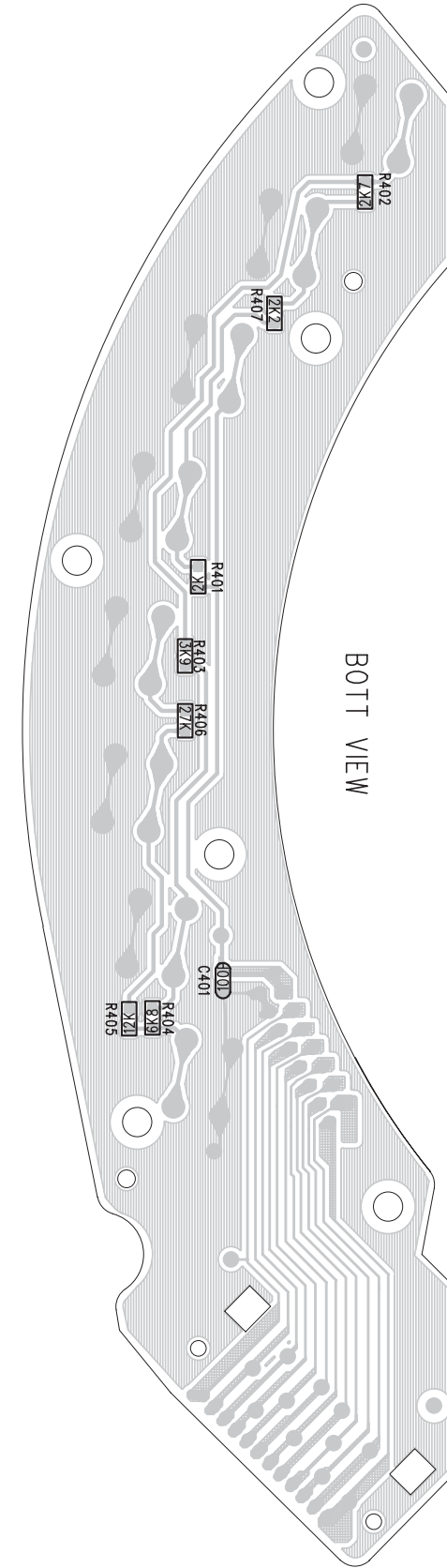


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LAYOUT DIAGARM -KEY BOARD
TOP VIEW



LAYOUT DIAGARM -KEY BOARD
BOTTOM VIEW



EXPLODED VIEW DIAGRAM

