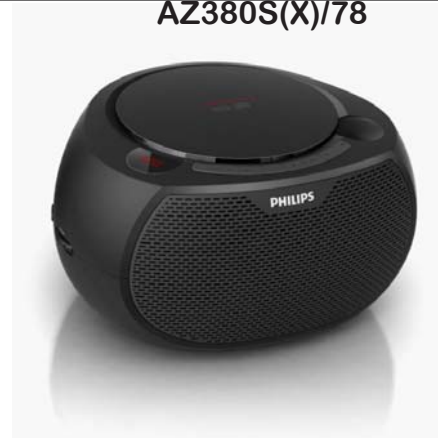


Service  
Service  
**Service**



# Service Manual



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Published by LZ 1213 Subject to modification

3141 785 37803

## Version 1.3



## TECHNICAL SPECIFICATION

<b>General description:</b> CDMP3 with USD Boombox Output Power 2x1W										1
<b>LIFETIME : 5 YEARS (ACC. TO UAN-D1611)</b>										2
<b>PERFORMANCE CLASSES :</b>										
	TUNER	SUPPLY, AMPLIFIER	SPEAKER BOXES	RECORDER	CLOCK	CD	DCC	TELEPHONE	REC. PLAYER	
I	x	x								3
II						x				4
III										5
<b>SAFETY REQUIREMENTS:</b>										
EN 60065 (IEC 65) CE ,										6
<b>RADIATION, IMMUNITY REQUIREMENTS: (EMC)</b>										
EN55013, .EN55020 , (Version 55 approbation CB only )										7
<b>CLIMATIC REQUIREMENTS: (acc. to UAN-D1590)</b>										
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
<b>POWER SUPPLY:</b>										
<b>MAINS (AC) operation</b>					<b>DC (int. or ext.) operation / Backup Buffer</b>					
Voltage selection:		See table below			Battery type: R14, UM2, C-cell x 6; nom.: 9V minimum operating voltage : 6.3V for CD and USB / 5.4V for Tuner					10
Selection:		See table below			Lifetime: CD ≥ 10 hours, TU ≥ <b>20</b> hours,  (R14 金霸王 alkaline batteries)					11
Frequency:		See table below			External DC: na					12
<b>POWER CONSUMPTION:</b>										
Power off mode: ≤1W /12/05 ;< 2W /96/55					Standby: 0nW (power off mode)					13
Maximum: 15 w					Maximum:					14
<b>General:</b>										
Q and R according to production division rules :					Q ≤ 1% (Major), Q ≤ 4% (Minor)					
Measured according to:					R ≤ 3% (CE52)					
<b>DERIVED VERSIONS:</b>								<b>APPROBATION</b>		
Version	AC Voltage/ Frequency on type plate	Safety Tolerance	Tuner							
/96 Taiwan	<b>110VAC</b> 50HZ	+/-10%	FM, MW					Transformer		15
/12/05 Europe	100~240VAC 60/50HZ	+/-10%	FM					SMPS Adaptor 9V/1.1A		
/55 Latin	120/230VAC 60/50HZ	+/-10%	FM ,AM					Transformer		
<b>REMARKS:</b>										
For operation and thermal stability test : 220/230/240Vac setting : 198Vac to 264Vac 120Vac setting : 99Vac to 140Vac dual voltage ac setting (120Vac / 230Vac) : 99Vac to 140Vac and 196Vac to 264Vac										16

# TECHNICAL SPECIFICATION

## TUNER PART

### TECHNICAL description:

	AM (circuitry)	FM/AM	(active components)	FM								
RF			Si4831	Si4831	1							
IF			Si4831	Si4831	2							
Detector					3							
Decoder					4							
<b>GENERAL part:</b>												
WAVE RANGE			TOLERANCES	TUNING STEP								
					5							
FM (05/12/96/55 version)	87.5 –108MHZ		LOW : +0/-0.3MHZ HIGH: +0.5/-0MHZ	na	6							
AM / 96	530 –1600KHZ		LOW: +0/-23KHZ HIGH: +60KHZ/-0	na	7							
MW / 55	530 –1707KHZ		LOW: +0/-23KHZ HIGH: +60KHZ/-0	na	8							
<b>AERIAL:</b>												
MW Ferrite	: 60 mm /D 10mm		FM telescope	: 430 mm	11							
FM wire	: N/A		Execution	- N/A	12							
<b>INDICATORS:</b>												
Pointer stroke:			Execution pointer:		13							
Knob indication over:			Field Strength:		14							
<b>ELECTRICAL DATA:</b>												
AM:	Nom.	limit	FM:	nom.	limit							
<b>RATED OUTPUT POWER</b> <b>10%THD 80%MOD120dB</b>	<b>1W</b>	<b>-6dB</b>	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			17							
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 <sup>th</sup> 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 120V setting	90	96 Vac	Oscillator stop voltage 120V setting	90	96 Vac							
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	/	N/A	Search tuning stop accuracy - 20uV ~ 20mV	/	N/A							
RF ≥ 1V/m	/		- 20mV ~ 500mV with step size = 50kH	/								
	/		- 20mV ~ 500mV with step size > 50kHz	/								
Search time of total tuning range	/	N/A	Search time of total tuning range		N/A							
IF	45KHZ	± 1kHz	IF	2.18MHZ	± 0.2MHZ							
Frequency drift vs temp. -10°C to 10°C	0.7 / 1000 * operating frequency		Frequency drift vs temp.	15KHZ/° C								
10°C to 30°C				10KHZ/° C								
30° to 50°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		36			
	lim.		21	19	50	125dBf	19		37			
MW	nom.		68	35	28	1000	21	3.0	38			
	lim.		72	28	24	500	16	>2.5	39			
	unit	μV/m	μV	dBf	μV/m	dBf	dB	dB	dB	mV/m	dB	kHz

## TECHNICAL SPECIFICATION

### SUPPLY, AF-AMPLIFIER & LOUDSPEAKER PART:

<b>TECHNICAL description:</b>						
	Power supply		Tone Control	AF-Amplifier	Loudspeaker	
Active components				D8227		1
Passive components					2 X 1 W, 8ohm	2
						3
<b>GENERAL part:</b>						
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
<b>INDICATORS:</b>						
Output power or VU-meter			No	: digits:		9
Frequency response			No	: digits:		10
Low power (battery)			No			11
<b>ELECTRICAL DATA:</b>						
<b>TONE/EQUALIZER/DBB</b>						
			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: 250	nW	16
			Residual noise (volume minimum)	Limit: 125	nW	17
Input sens.: Nom.			650mV ± 150		mV	
for 50mW Limit:					mV	
Line outp.: Nom.					mV	
voltage Limit:					mV	
<b>OUTPUT POWER:</b>						
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		10db at125hz vol max-20db		Disc SBC429 Track 12		
<b>LOUDSPEAKER (output):</b>						
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
<b>REMARKS:</b>						
27 : Measured in Tuner mode; 28: CD or Tape mode.						32

## TECHNICAL SPECIFICATION

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

Technical description:					
	Input	Output	Motor/control	Logic control	1
Active components				Ali M5676	2
Passive components					3
	Signal processing	D/A converter	HF-preamplifier	Servoprocessor	4
Active components	CD: Ali M5676	CD: Ali M5676	Ali M5676	Ali M5676	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 $\mu$ m	900 $\mu$ m	TNO 7,9 of SBC 444A (7104 099 24990)		10
Eccentric	150 $\mu$ m	200 $\mu$ m	TNO 1,24 of 200 $\mu$ m disc (7104 099 24960)		11
Fingerprint	No audible defect		TNO 11 of Subchassis 8A		12
Black dot	500 $\mu$ m	600 $\mu$ m	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)					
$\pm$ Z axis	5 G				24
$\pm$ 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
<b>Acoustic feedback:</b>	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)	3.1V				28
SNR unwt'd.	60 dB	55 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)	40 dB	40 dB			32
Frequency response Vol.max.-20dB (DBB on)	-1.5dB -1dB	$\pm$ 3dB at 80Hz $\pm$ 3dB at 12.5kHz			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			37
Frequency accuracy	-	+/-0.5 %			38
De-emphasis	15 $\mu$ s / 50 $\mu$ s Switchable via Subcode information				39
REMARKS:					
- Amplification reserve for CD = +2dB ( $\pm$ 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	
<b>CD-RW playability</b>					
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	
<b>MP3 playability</b> : See specification on CD-DA					
<b>MP3 - Data-format-check</b>					
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”		Text in display ok	
8	CD-Extra (1 audio seesion + 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			Not 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.

**(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.

**(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.

**(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.

**(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.

**(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."

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.

## ESD

**(GB)** Warning !

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

**(S)** Varning !

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

**(SF)** Varoitus !

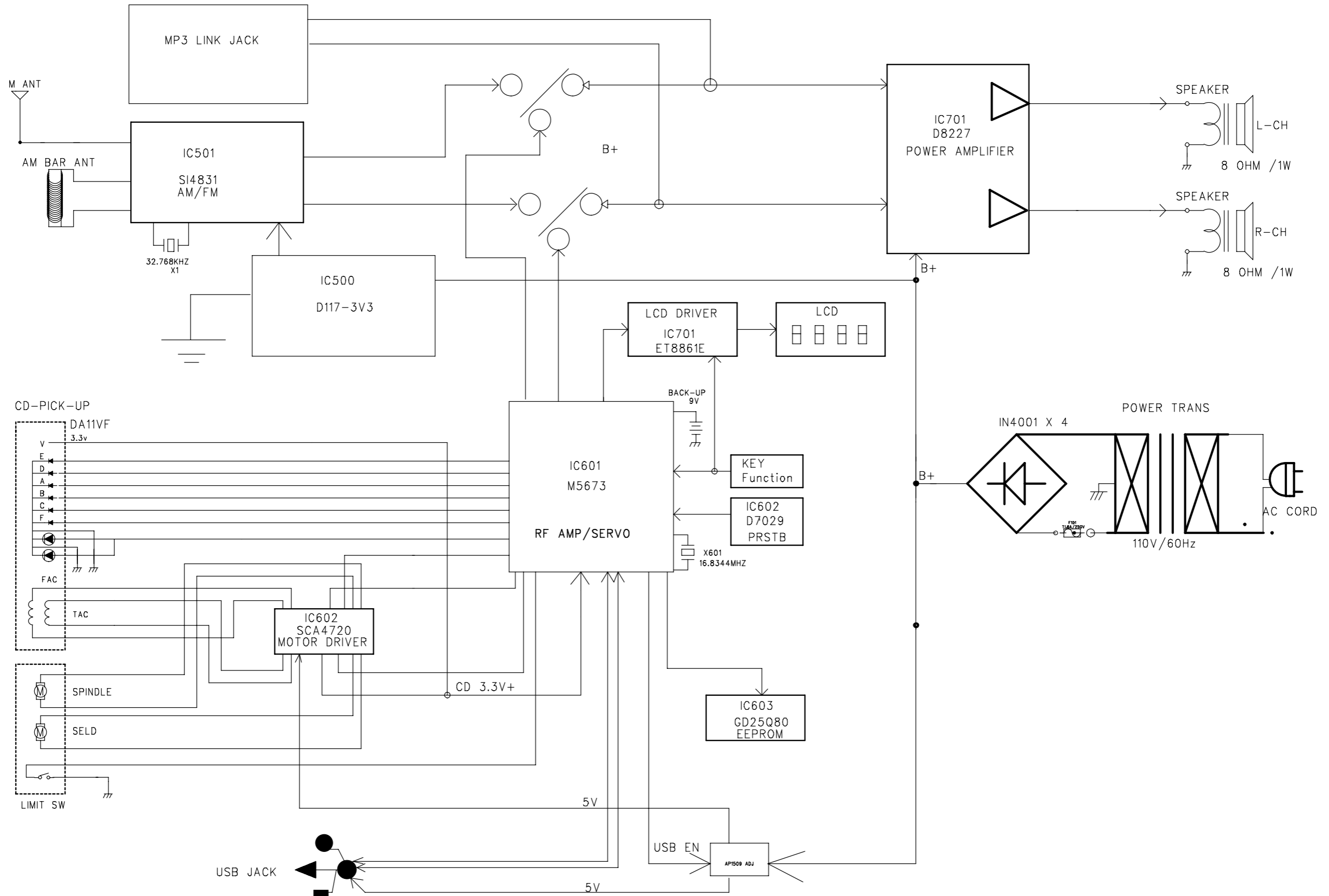
Avatussa laitteessa ja suojauslaitteiden ohitettaessa olet alltiina näkymättömälle laserisäteilylle. Älä katso säteeseen!

## DK Advarsel !

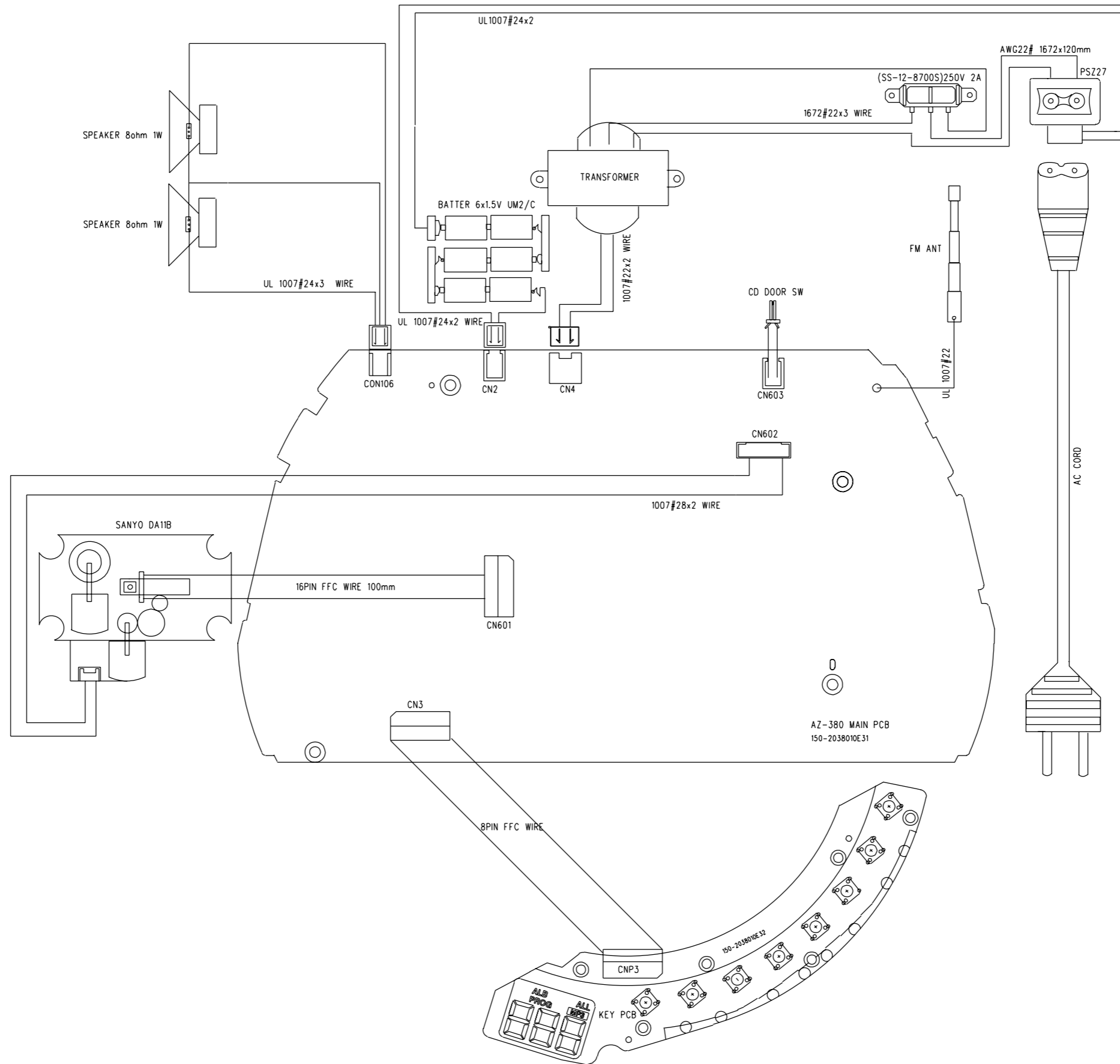
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.



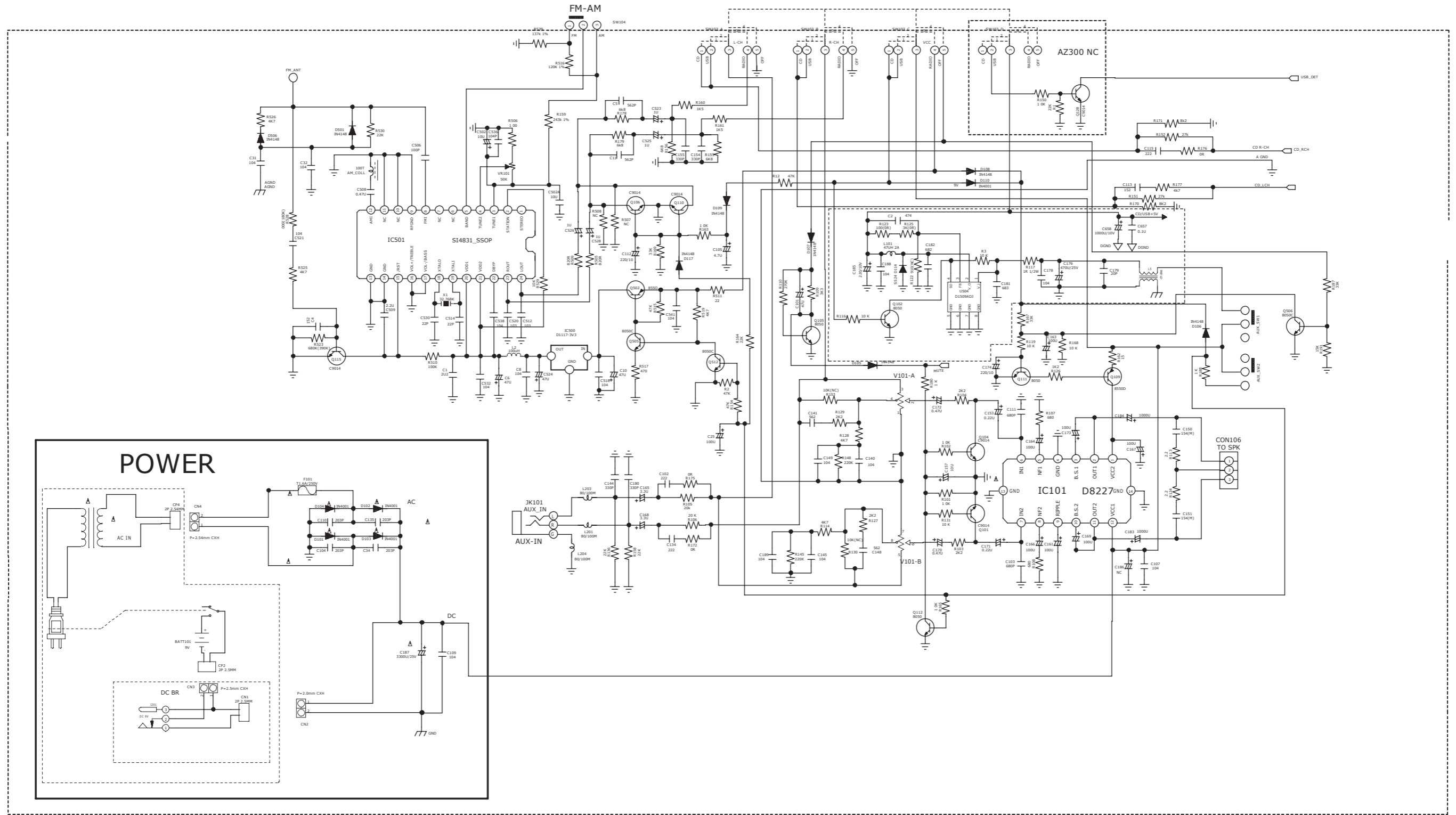
# SET BLOCK DIAGRAM

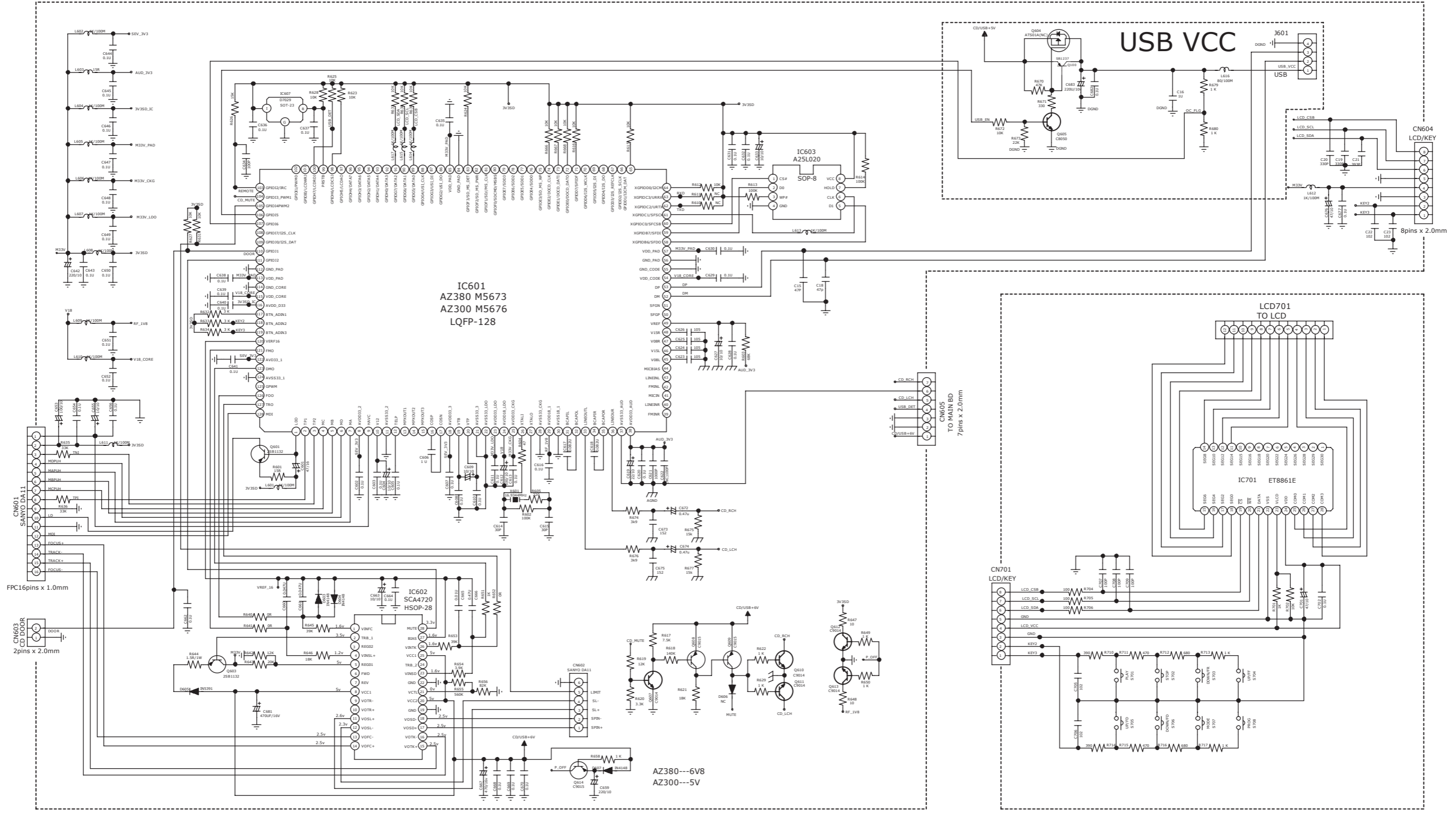


# WIRE CONNECT DIAGRAM

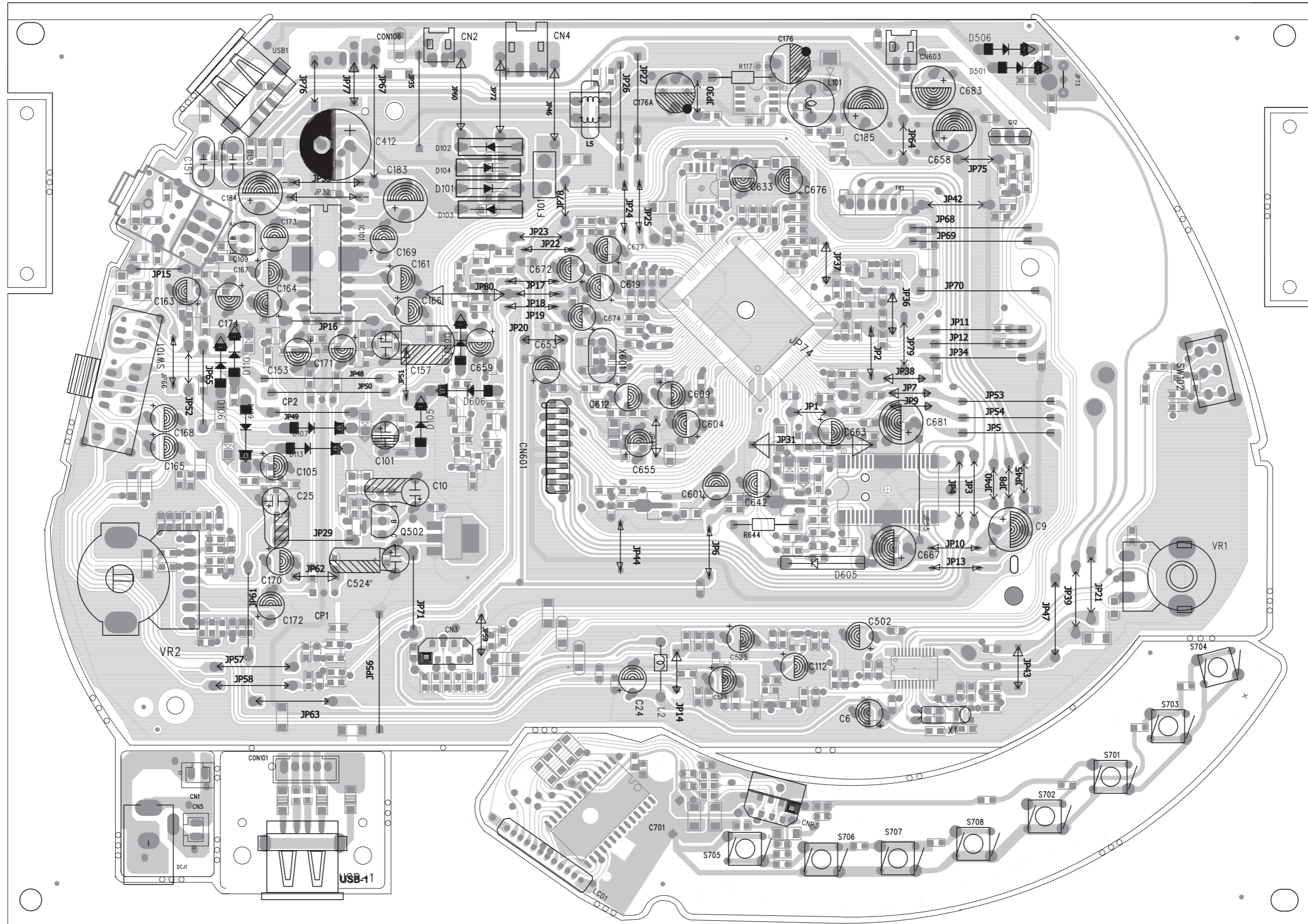


# CIRCUIT DIAGRAM -MAIN BOARD PART1

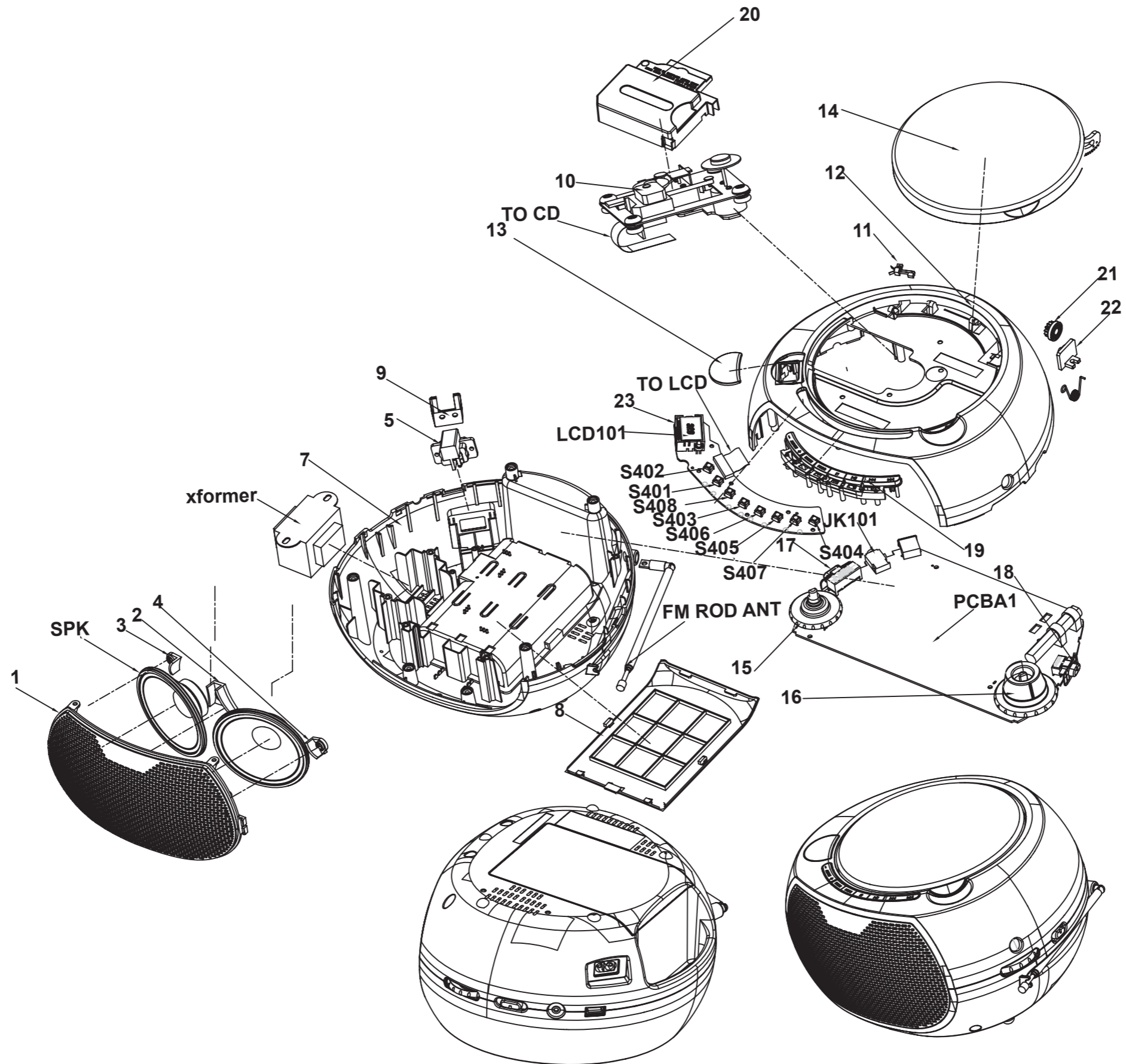




# LAYOUT DIAGRAM -MAIN BOARD TOP SIDE VIEW



EXPLODED VIEW DIAGRAM



## **Version History**

V1.0: initial release

V1.1: Add /93 version

V1.2: Add /94, AZ380S/78 version

V1.3: Add AZ380SX/78 version