

Service
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Service Manual

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Subject to modification

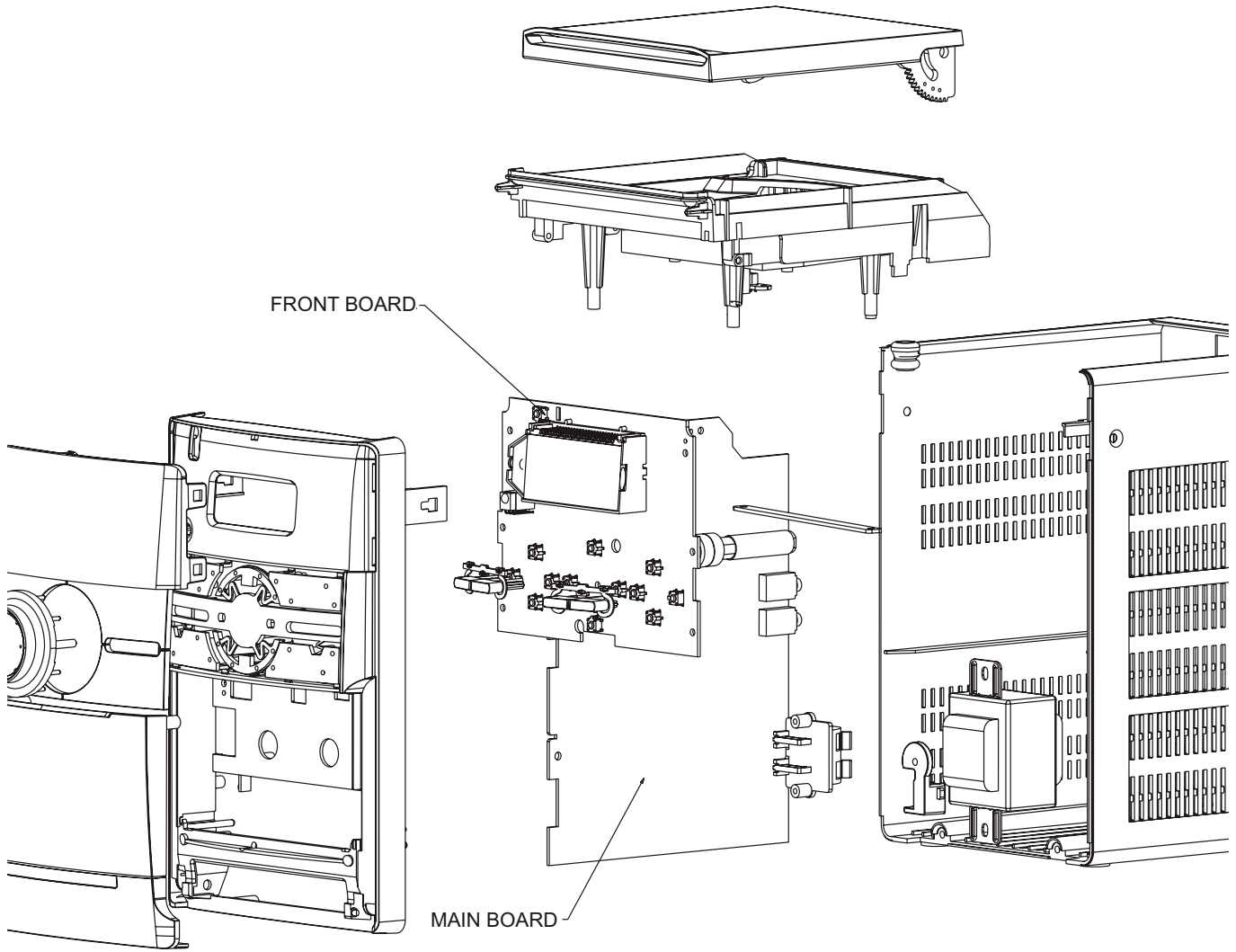
GB 3141 785 32143

Version 1.3



PHILIPS

PCBS LOCATION



SPECIFICATIONS

AMPLIFIER

Output power 2 x 2W RMS
 Signal-to-noise ratio ≥ 60 dBA (IEC)
 Frequency response 125 – 16000 Hz
 Impedance loudspeakers 8Ω

CD PLAYER

Frequency range 125 – 16000 Hz
 Signal-to-noise ratio 65 dBA

TUNER

FM wave range 87.5 – 108 MHz
 MW wave range 531 – 1602 kHz
 Sensitivity
 – FM 26 dB sensitivity 20 μ V
 – MW 26 dB sensitivity 5 mV/m
 Total harmonic distortion $\leq 5\%$

TAPE DECK

Frequency response
 Normal tape (type I) 125 – 8000 Hz (8 dB)
 Signal-to-noise ratio
 Normal tape (type I) 40 dBA
 Wow and flutter $\leq 0.4\%$ JJS

SPEAKERS

Bass reflex system
 Dimensions (w x h x d) . 134 x 230 x 152 (mm)

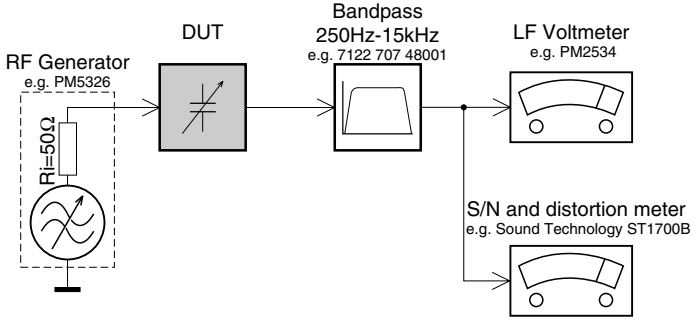
GENERAL INFORMATION

AC Power 220 – 230 V / 50 Hz
 Dimensions (w x h x d) .. 148 x 233 x 216 (mm)
 Weight (with/without speakers)
 approx. 3.65 / 1.53 kg
 Power consumption
 Active 15 W
 Standby < 4 W

Specifications and external appearance are subject to change without notice.

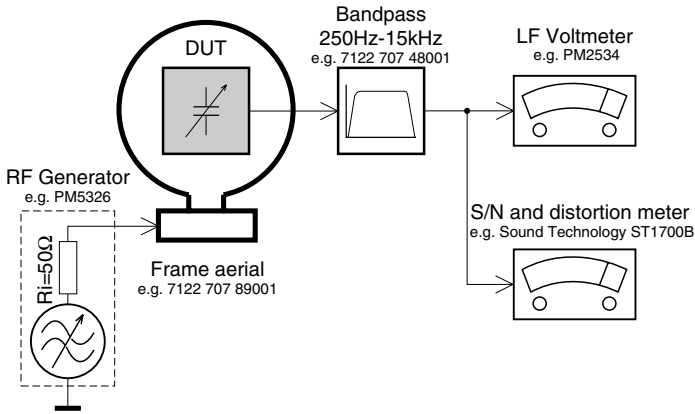
MEASUREMENT SETUP

Tuner FM



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

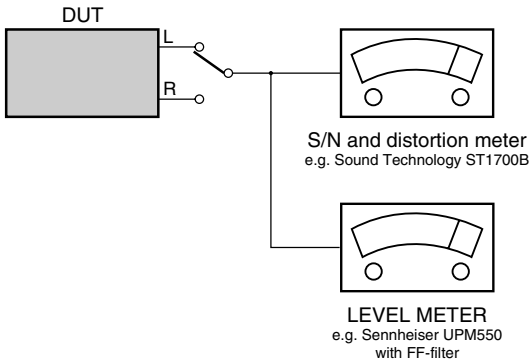
Tuner AM (MW,LW)



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).

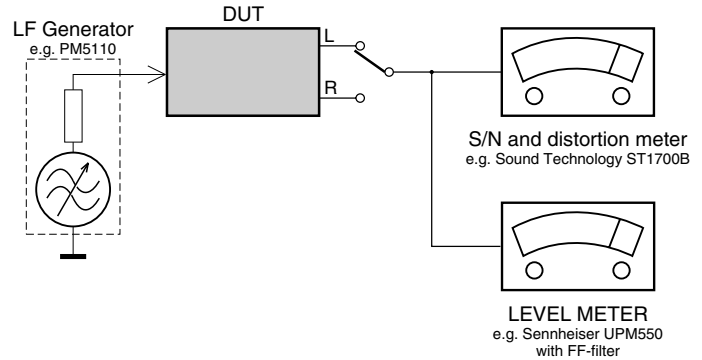
CD

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

Service Tools:

Universal Torx driver holder	4822 395 91019
Torx bit T10 150mm	4822 395 50456
Torx driver set T6-T20	4822 395 50145
Torx driver T10 extended	4822 395 50423

Compact Disc:

SBC426/426A Test disc 5 + 5A	4822 397 30096
SBC442 Audio Burn-in test disc 1kHz	4822 397 30155
SBC429 Audio Signals disc	4822 397 30184
Dolby Pro-logic Test Disc	4822 395 10216

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

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.

③

FAST LENS CLEANING (dry brush)

Use lens cleaning CD
 SBC AC300.....9082 100 00043

Insert the lens cleaning CD, press PLAY and follow the voice guide's instructions on the CD.

④

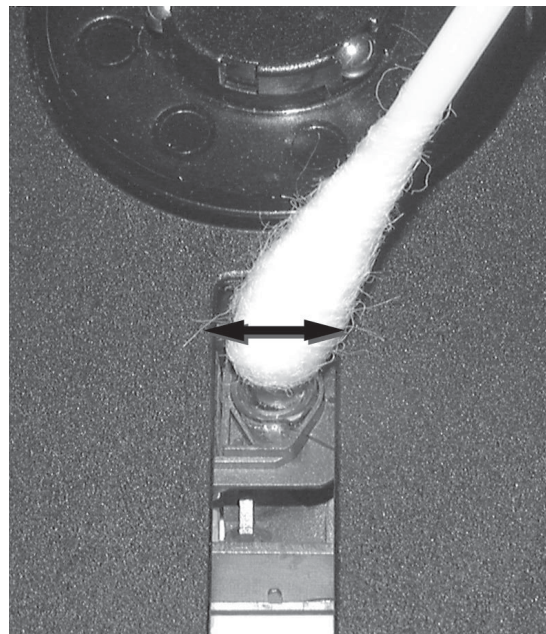
LIQUID LENS CLEANING

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 B4-No2", available with codenumber 4822 389 10026.

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.

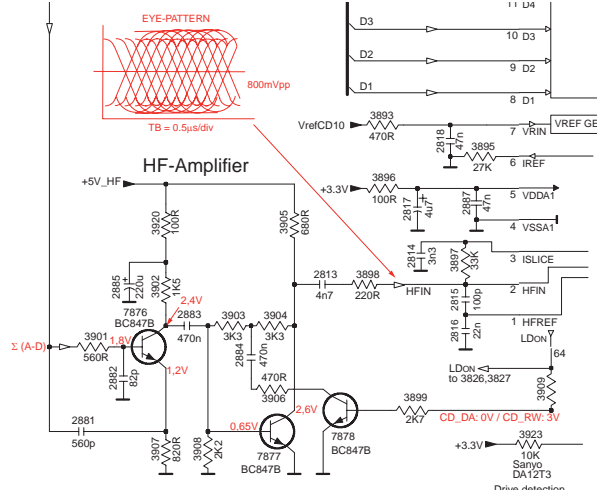


INSTRUCTIONS ON CD PLAYABILITY

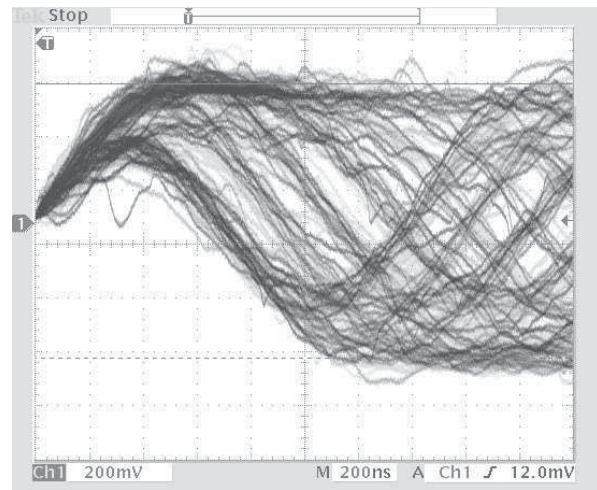
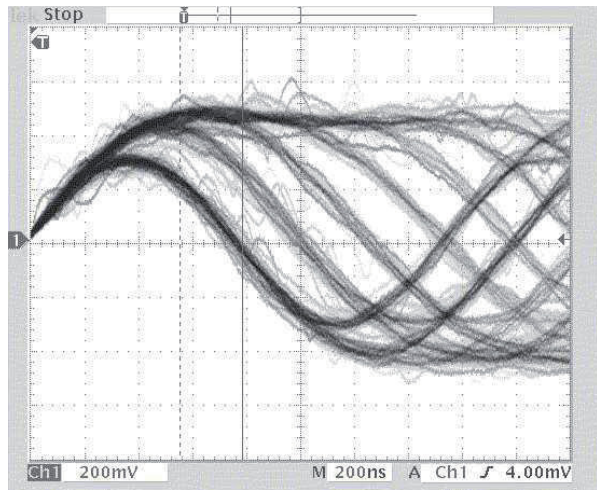
5

EYE-PATTERN SIGNAL – JITTER MEASUREMENT

Measure the signal on the input of the Signal processor using an **analog** oscilloscope. Please find the exact measuring point in your Service Manual.



See below examples of the signal. Amplitude should read at least 700mVpp using SBC444A.



If the oscilloscope shows a signal like the 'bad' one, and/or the amplitude decreases within 1 minute - the CD drive has to be replaced.

6

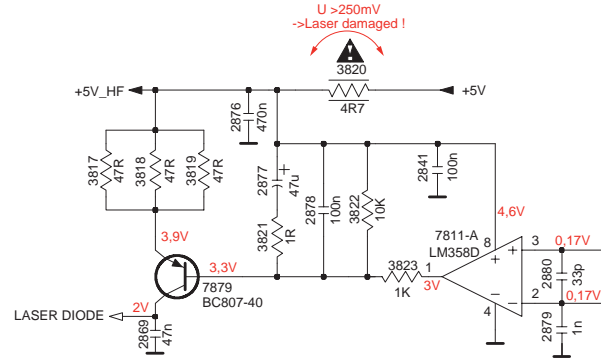
CD DRIVE – LASER CURRENT MEASUREMENT

The laser current can be measured as a voltage drop on a resistor. The resistor is marked in every Service Manual. The value depends on the type of CD drive.

	typical value	most probably defect
VAMxxxx	: 150-230mV	≥350mV
MCDxx	: 170-230mV	≥300mV
DA1x	: 210-250mV	≥350mV
DA2x	: 175-200mV	≥250mV

Use SBC444A (CD-DA) for measurement.

Laser power control



7

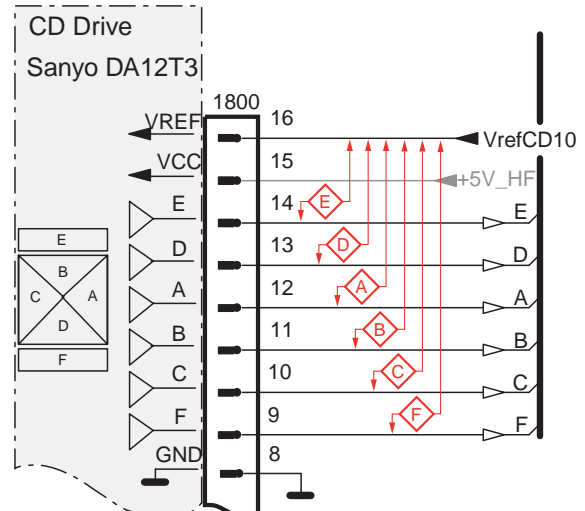
CD DRIVE – OFFSET MEASUREMENT

The photodiodes of the CD-drive may have an offset. These offsets have to be compensated by the signal processor. High offsets can lead to poor playability of some CDs (skipping tracks).

To measure the offset values, start the **Service Test Program** - section "Focus Test" without a CD.

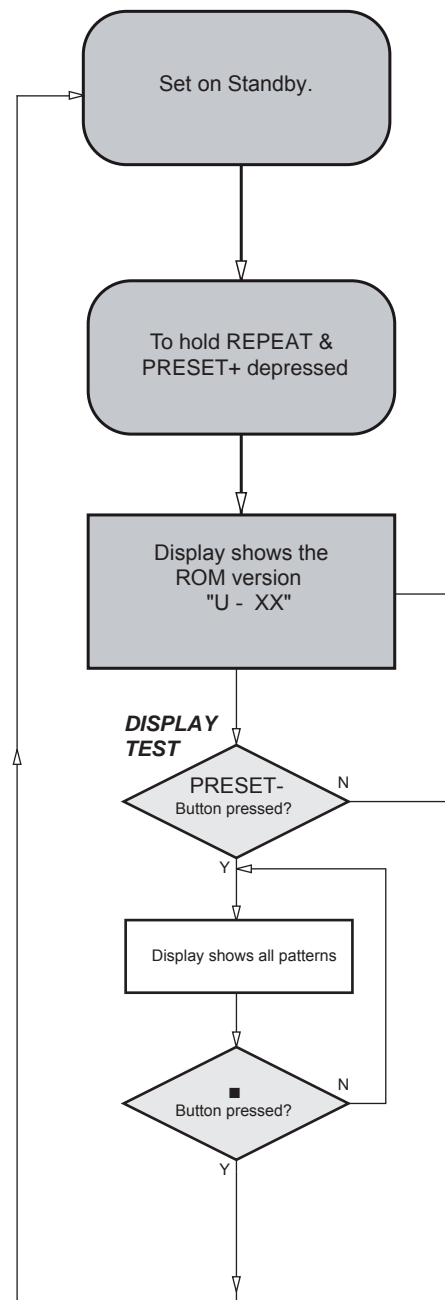
The offsets can be measured with a DC Millivoltmeter directly on the connector (see drawing below). Pin numbering varies from drive to drive.

The values from diode A-D should read $0 \pm 10mV$. Diodes E and F are less critical.



If one of the offsets is higher than $\pm 10mV$ the CD drive has to be replaced. Otherwise replace the Signal Processor.

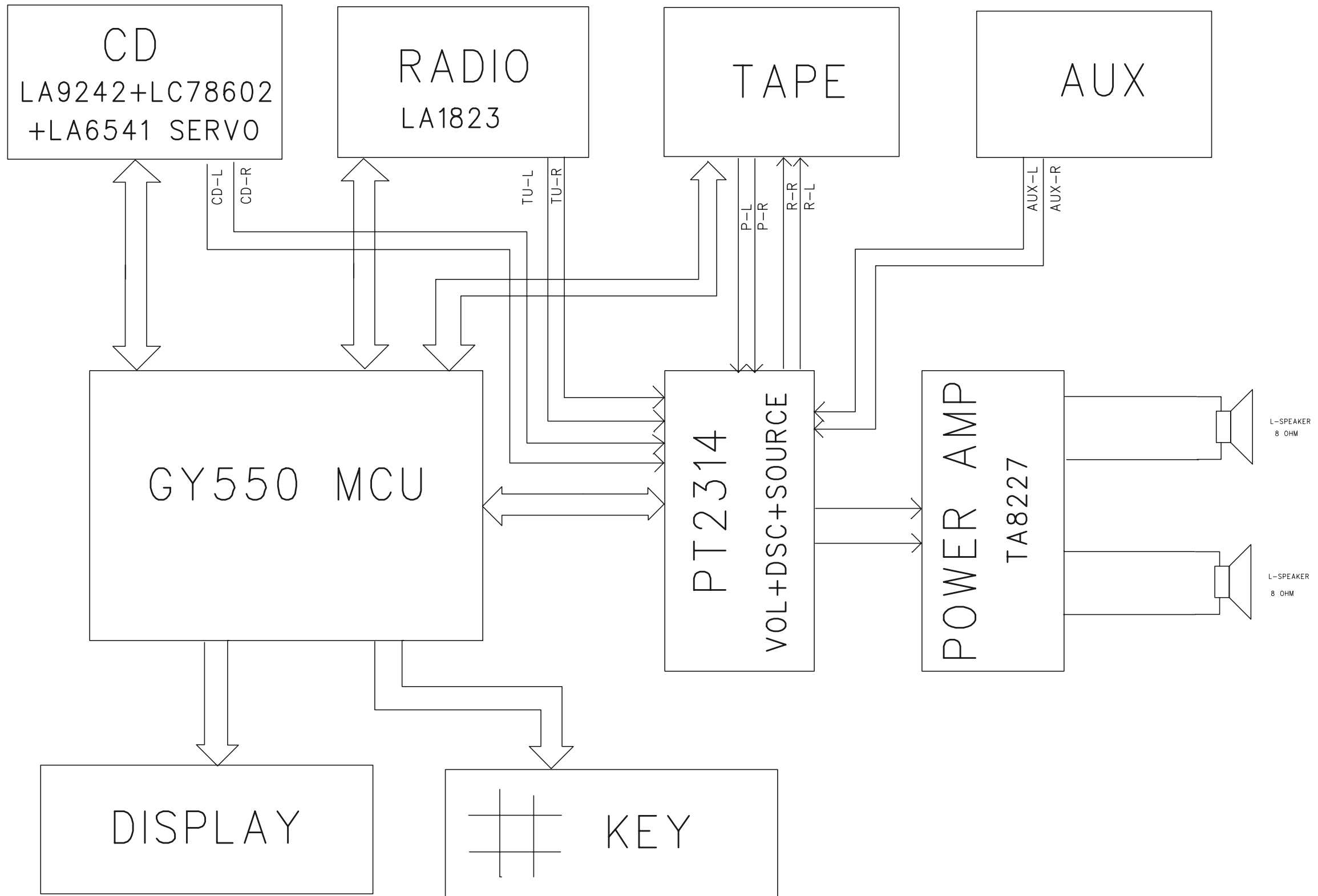
SOFTWARE VERSION CHECKING



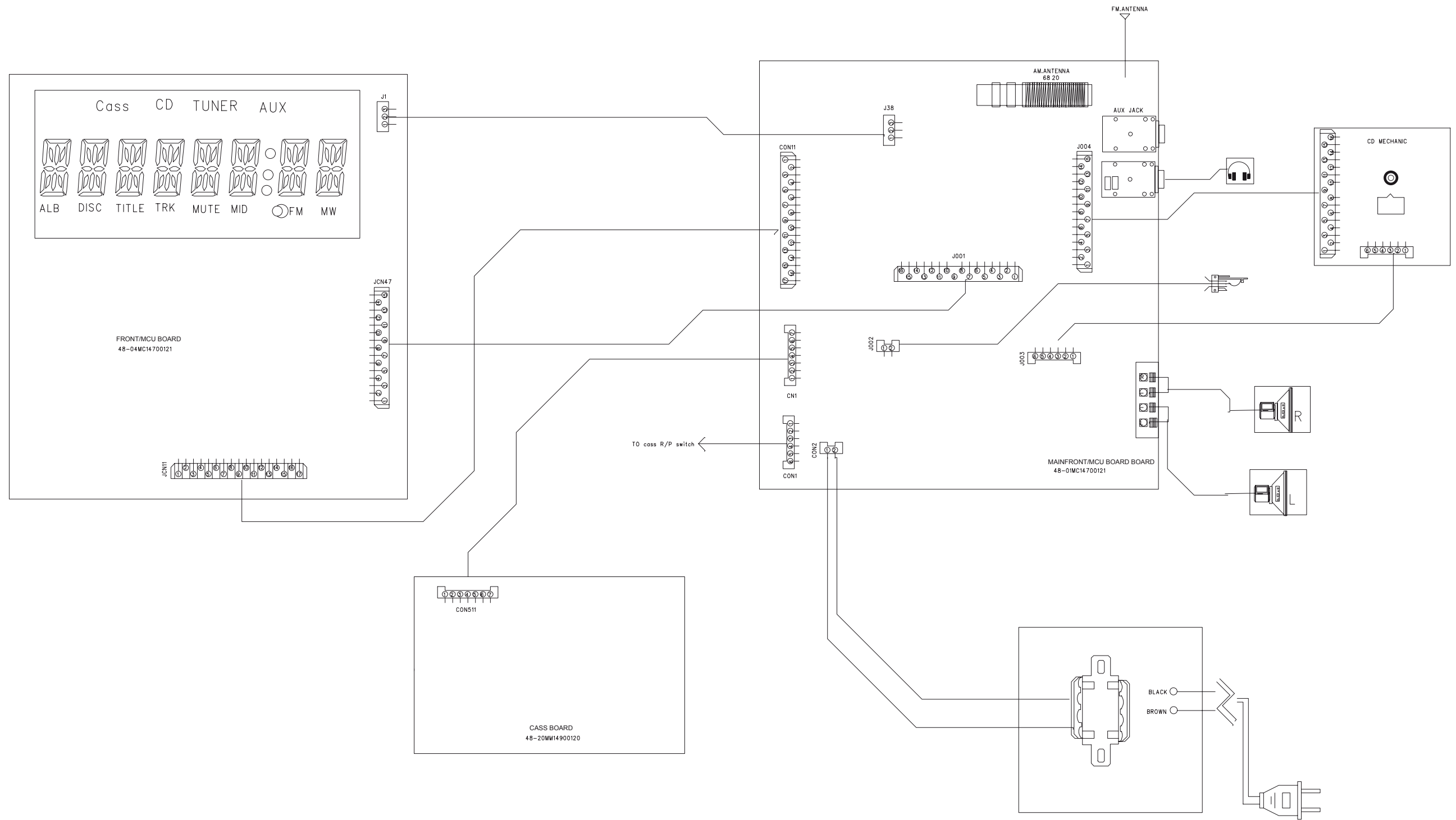
U refers to Version

XX refers to Software version number of the uProcessor (counting up from 01 to 99)

SET BLOCK DIAGRAM



SET WIRING DIAGRAM

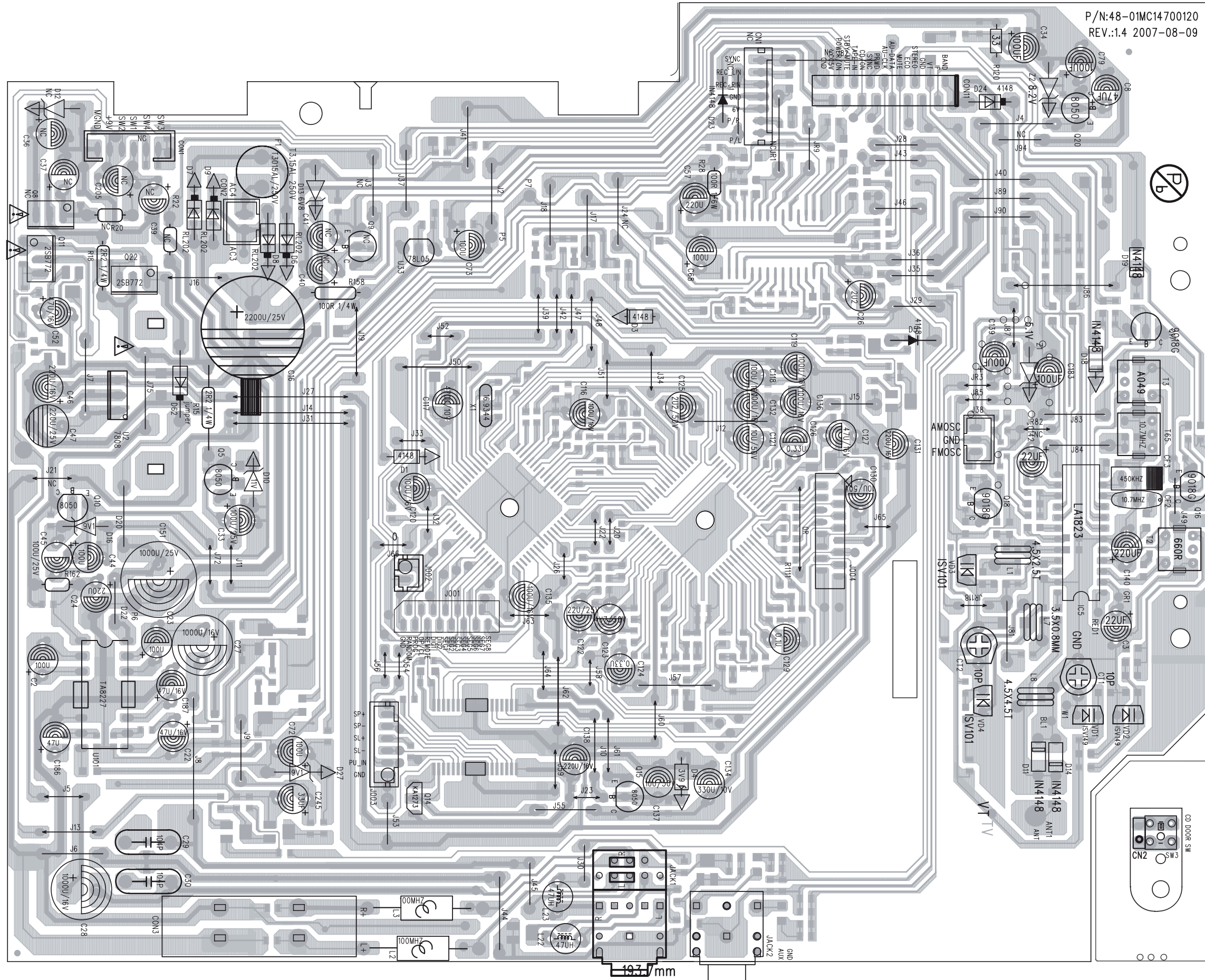


MAIN BOARD

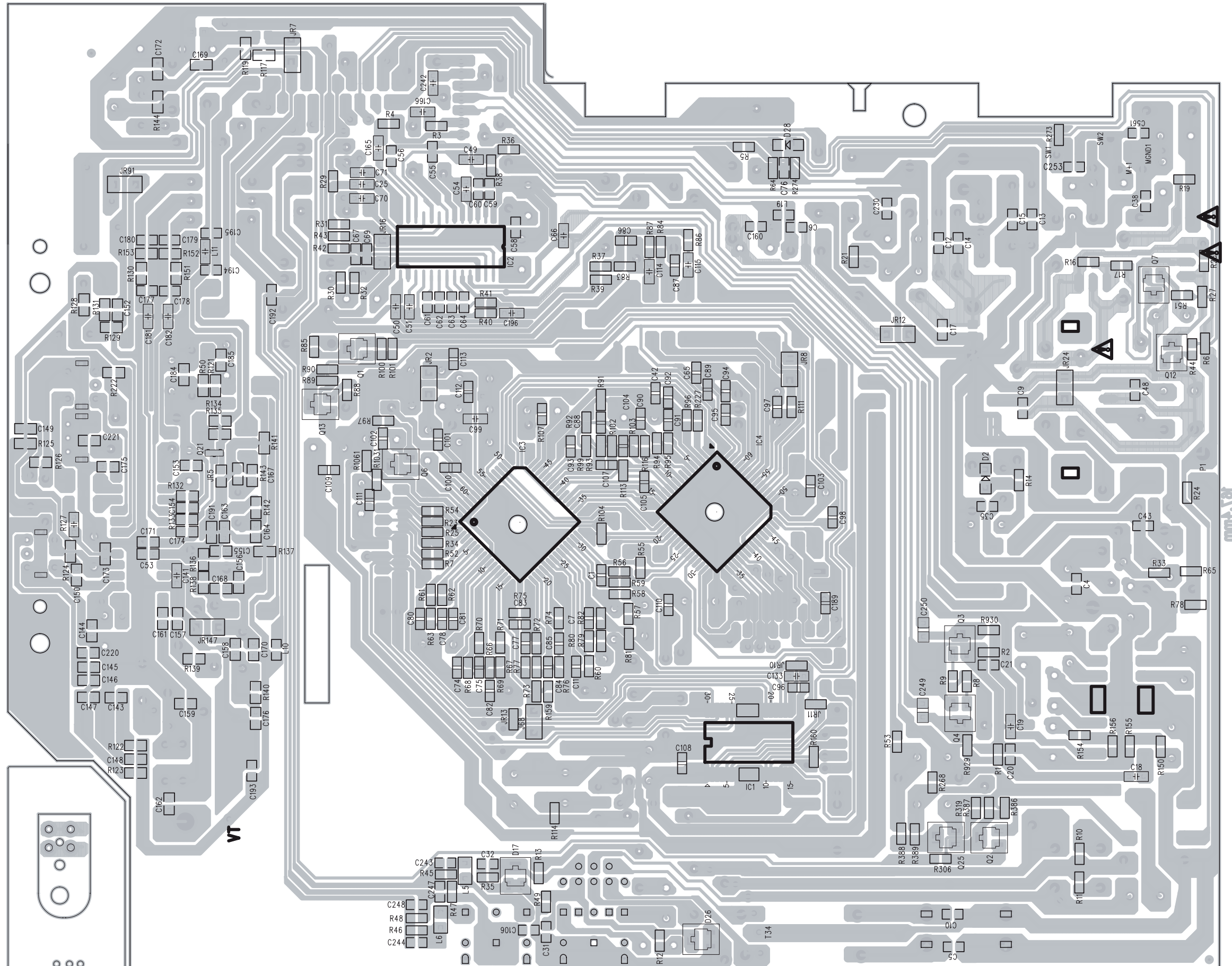
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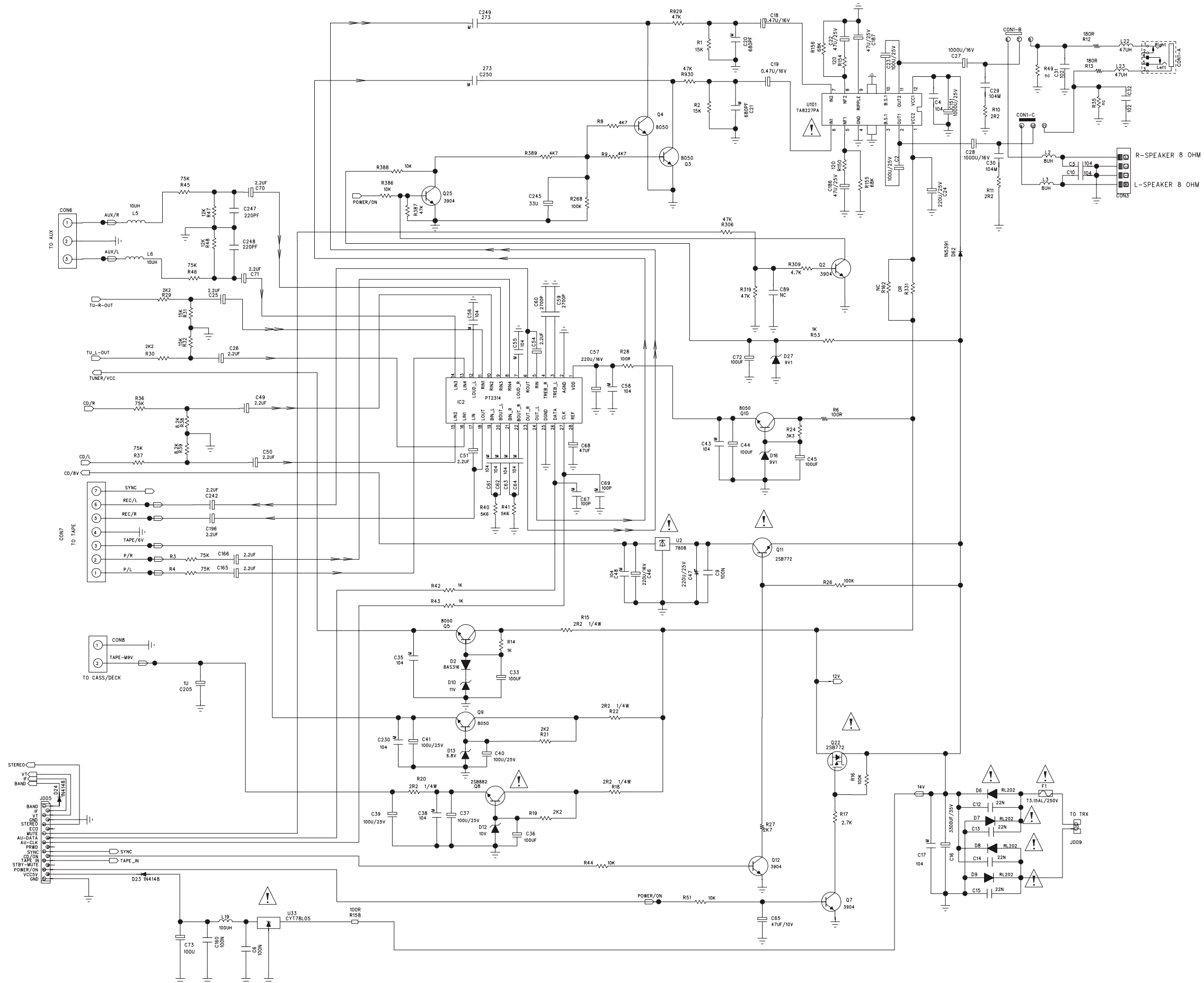
PCB LAYOUT - MAIN BOARD TOP VIEW



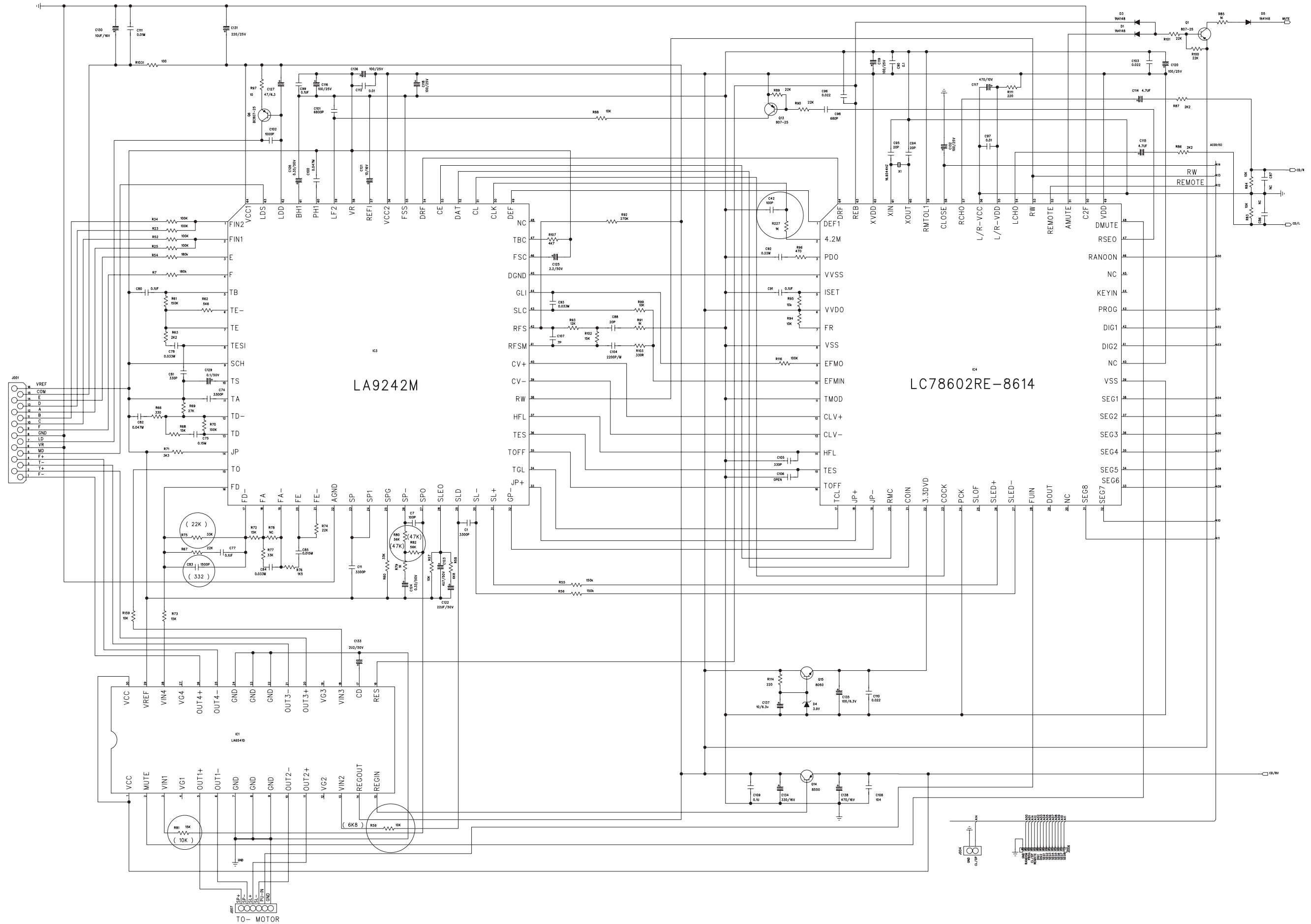
PCB LAYOUT - MAIN BOARD BOTTOM VIEW



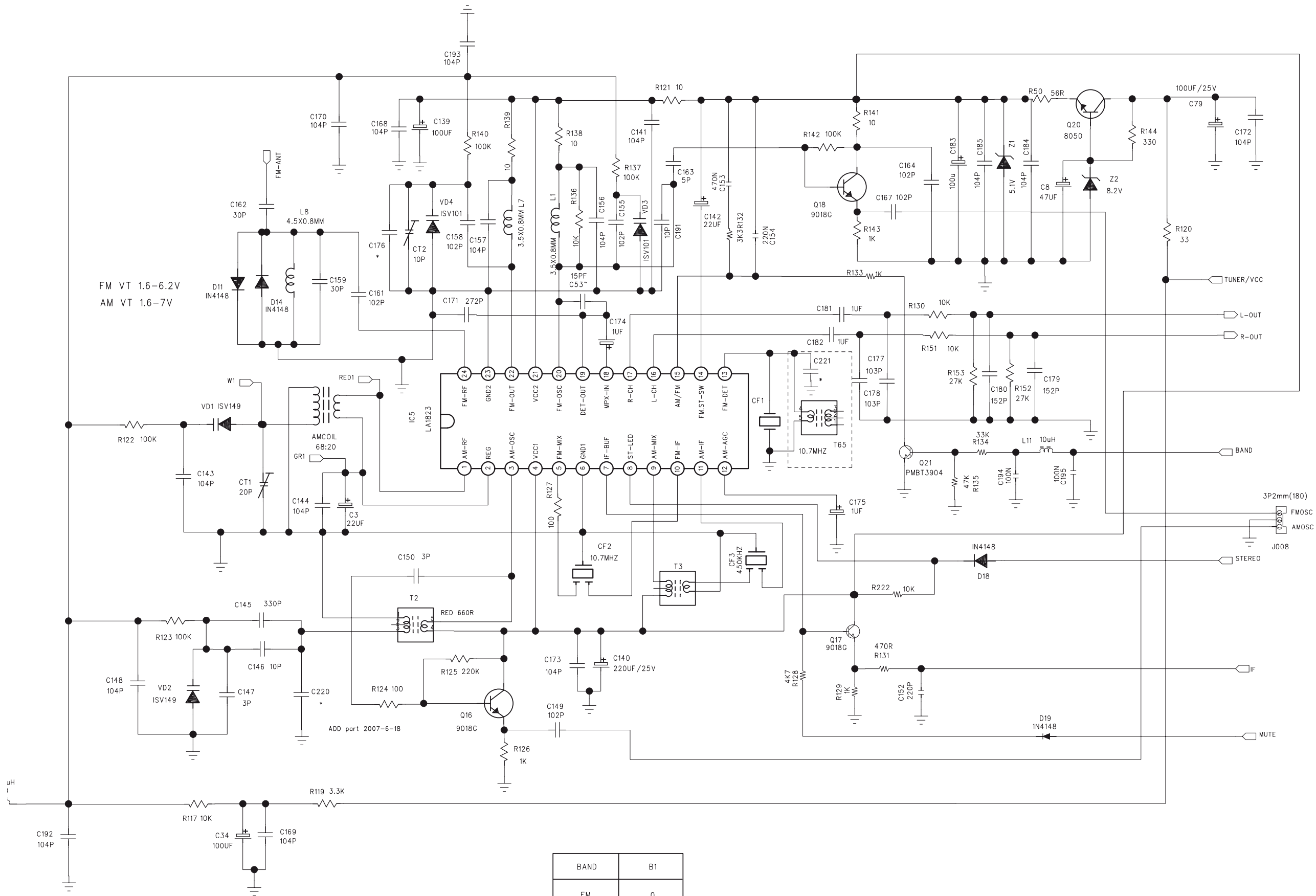
CIRCUIT DIAGRAM - MAIN BOARD AF & AMP PART



CIRCUIT DIAGRAM - MAIN BOARD CD PART



CIRCUIT DIAGRAM - MAIN BOARD TUNER PART



FM VT 1.6-6.2V
AM VT 1.6-7V

ADD part 2007-6-18

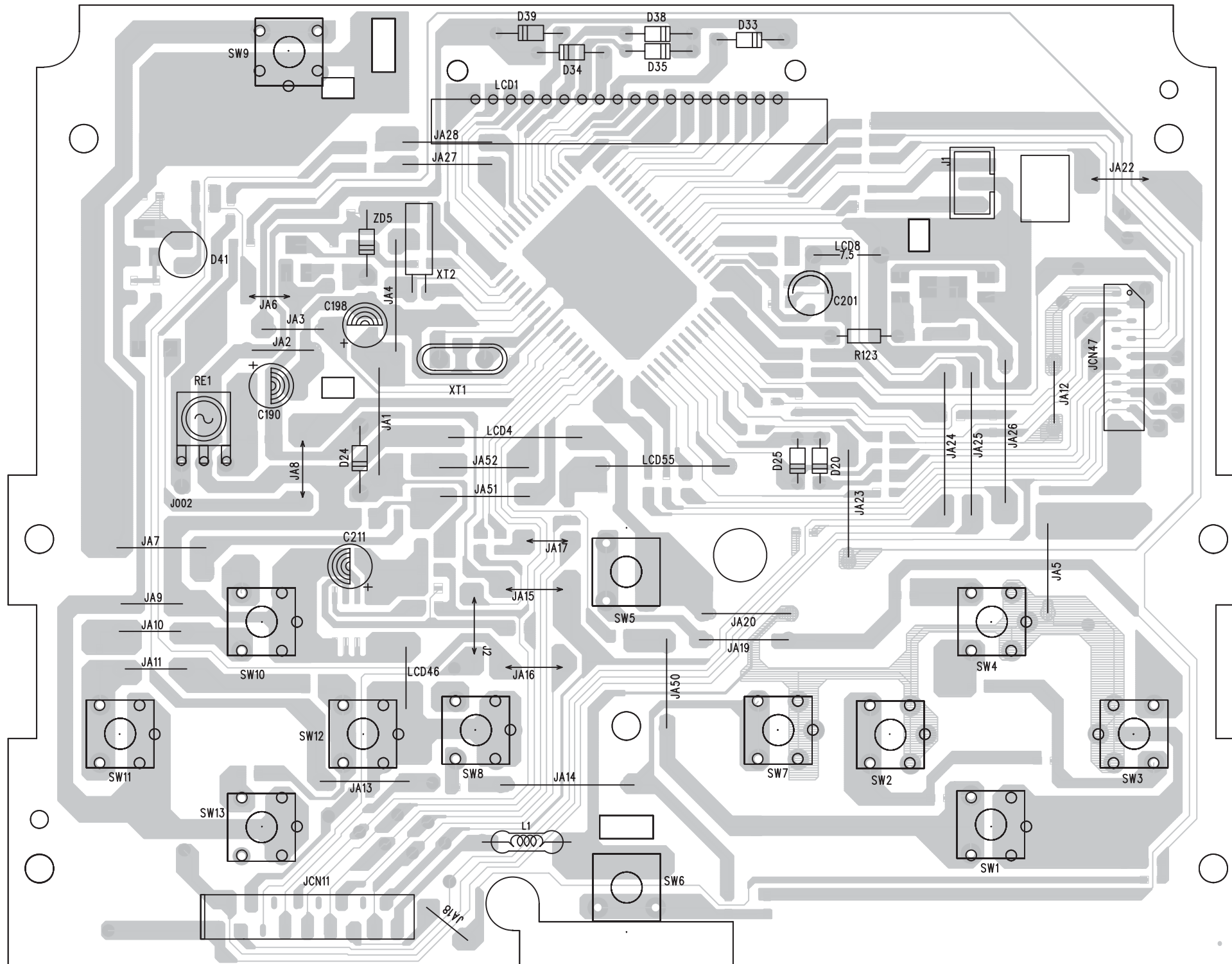
BAND	B1
FM	0
AM	1

FRONT BOARD

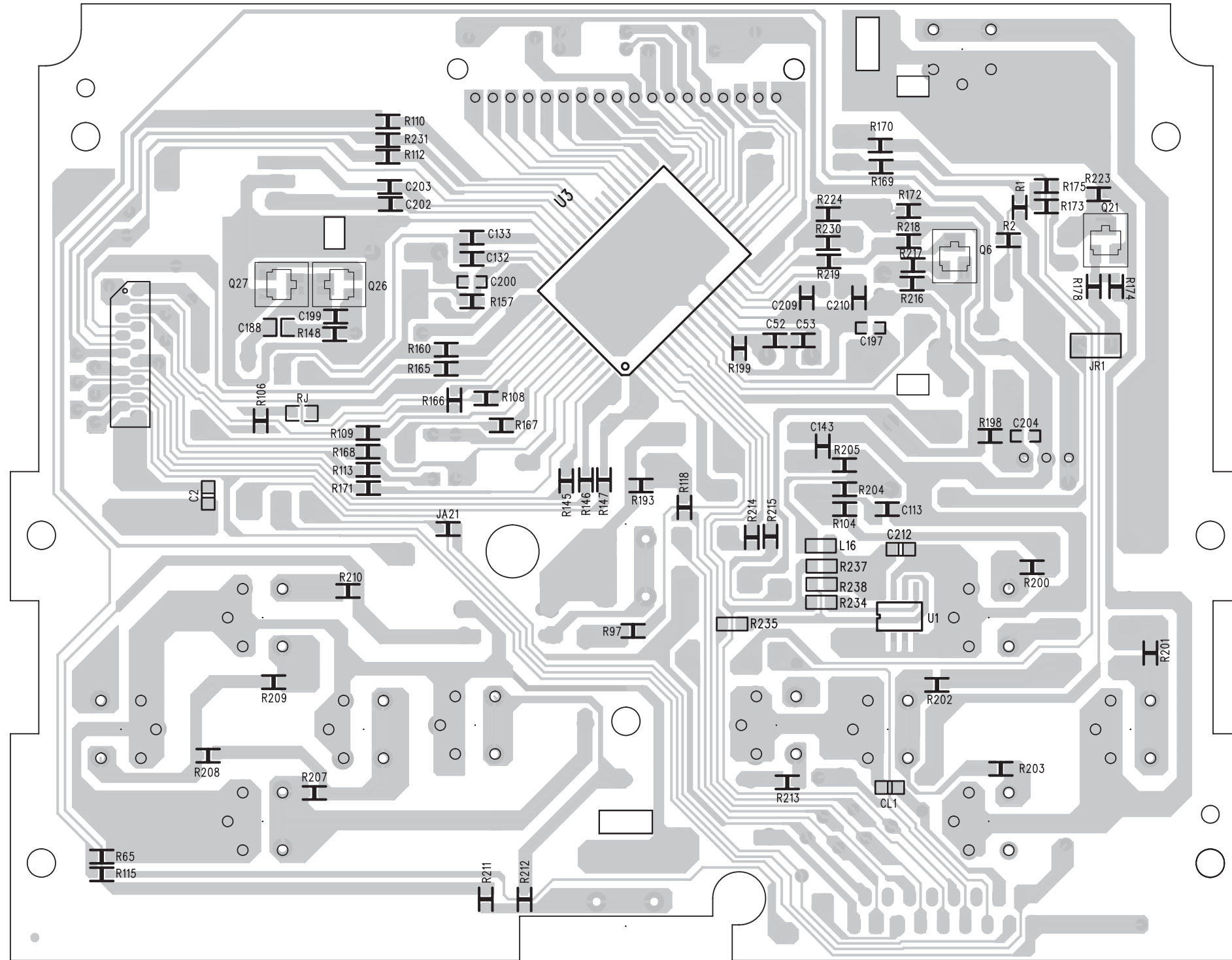
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PCB LAYOUT - FRONT BOARD (TOP VIEW)



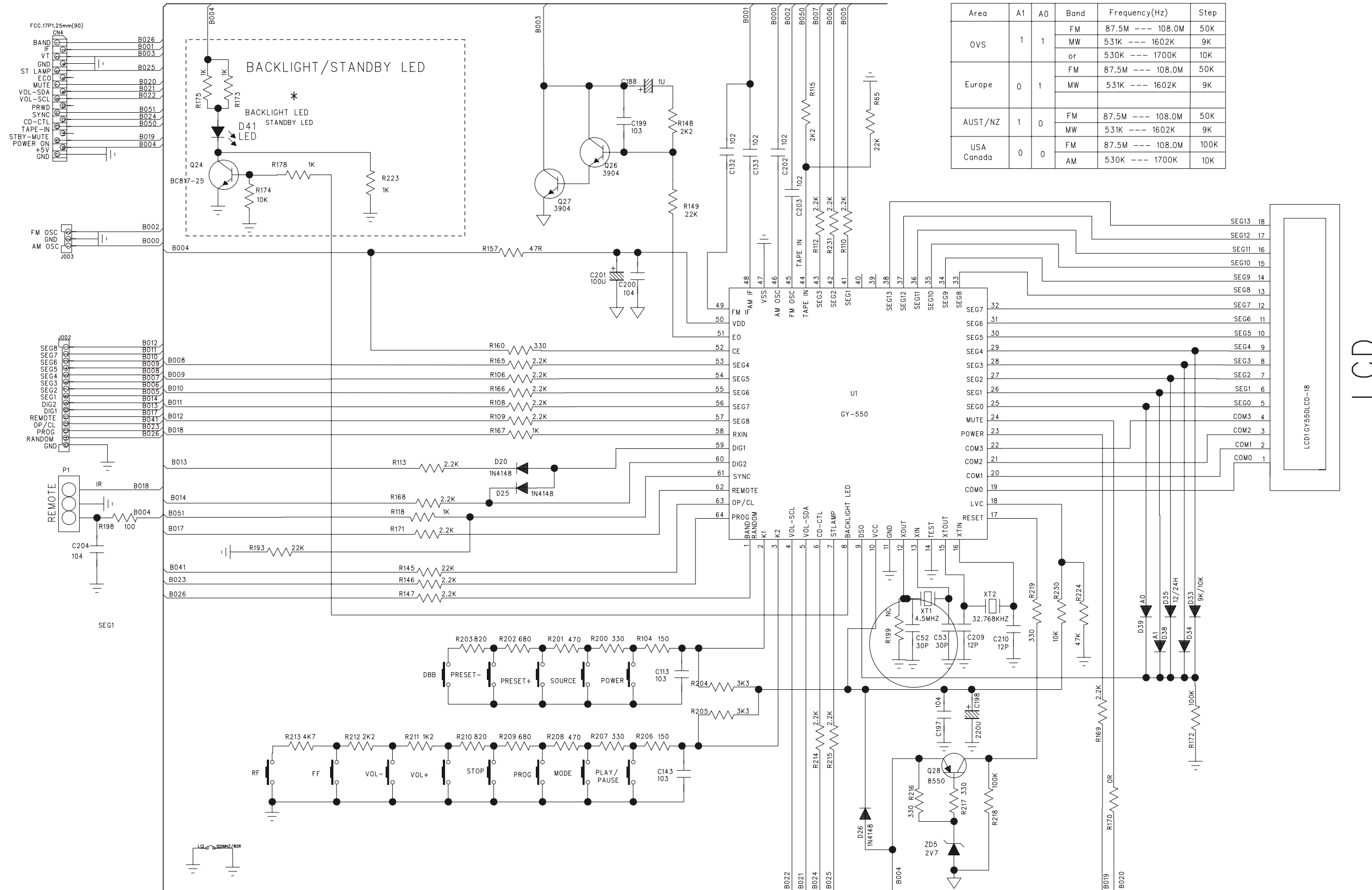
PCB LAYOUT - FRONT BOARD (BOTTOM VIEW)



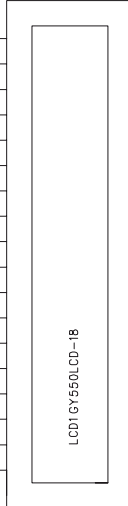
CIRCUIT DIAGRAM - FRONT BOARD

12/24H	9K/10K	D34			
12H	24H	9K	10K	YES TAPE	NO TAPE
0	1	1	0	1	0

Area	A1	A0	Band	Frequency(Hz)	Step
OVS	1	1	FM	87.5M --- 108.0M	50K
			MW	531K --- 1602K	9K
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
USA Canada	0	0	FM	87.5M --- 108.0M	100K
			AM	530K --- 1700K	10K



LCD

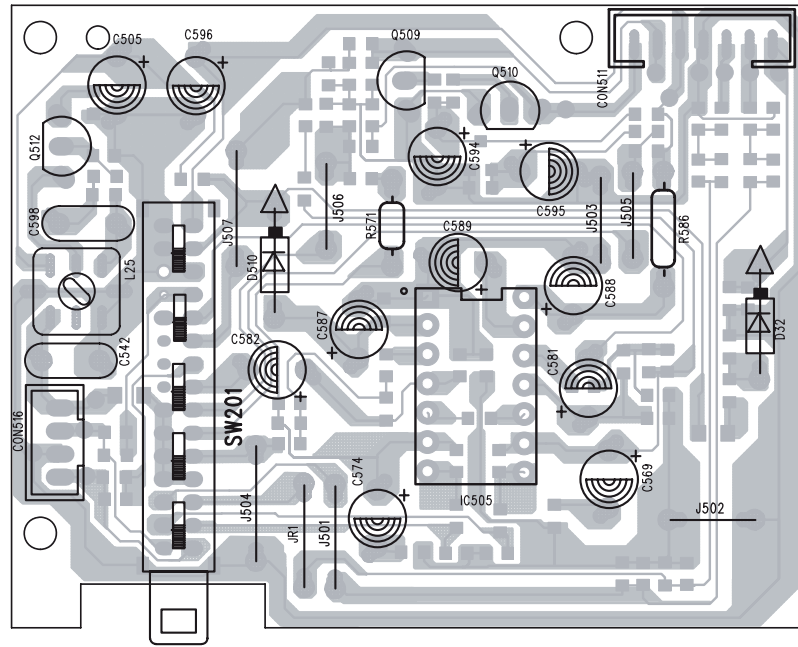


CASSETTE BOARD

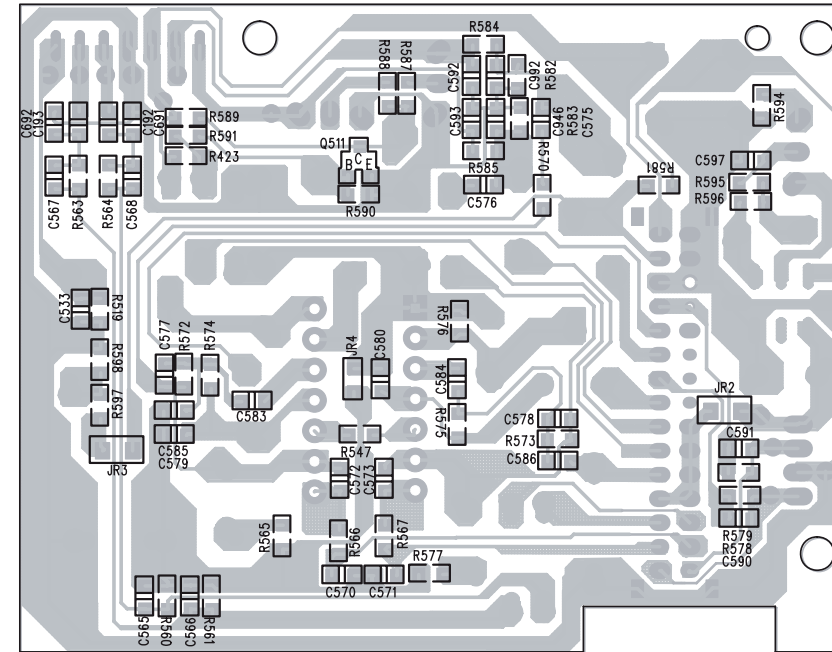
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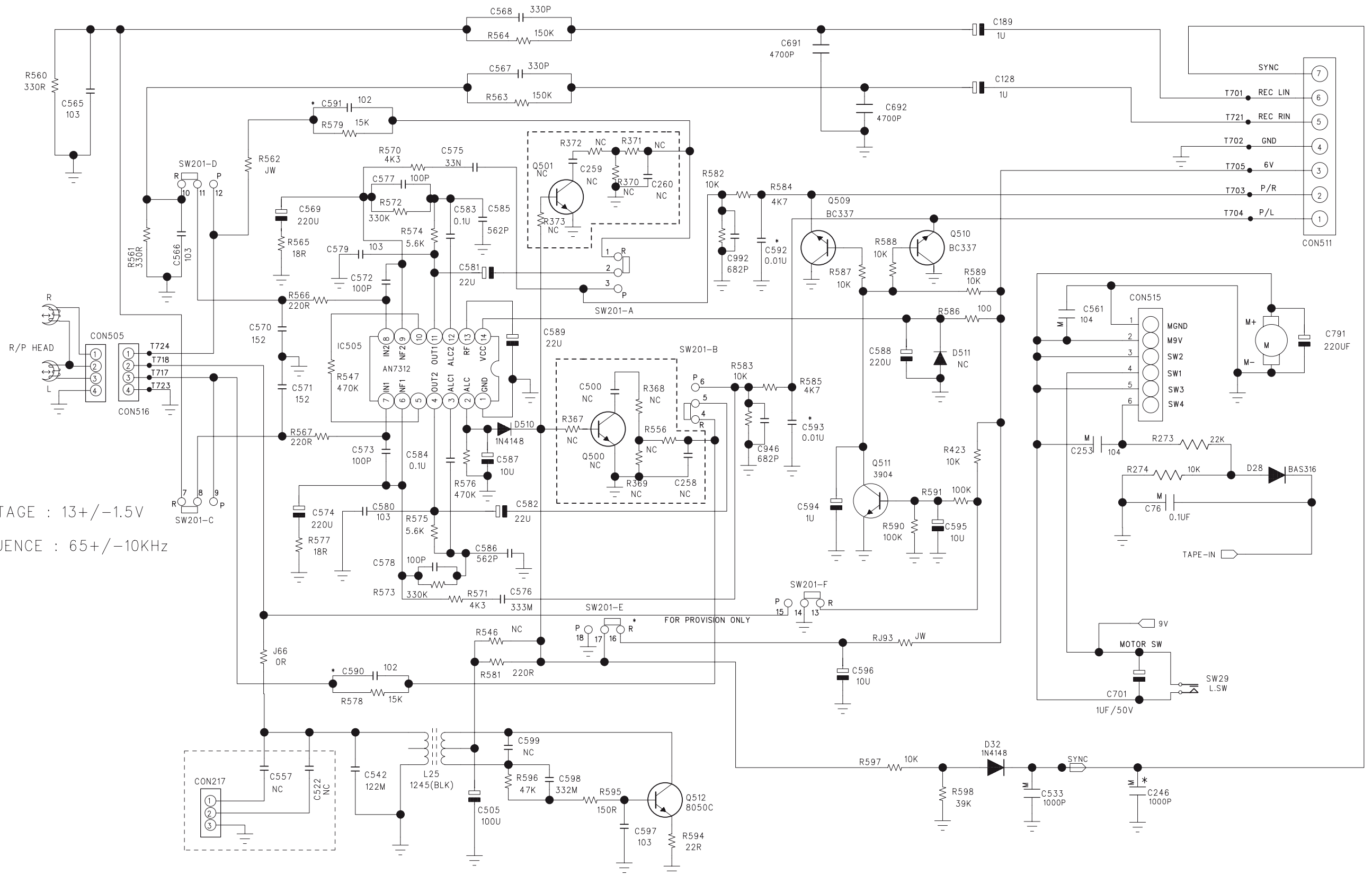
PCB LAYOUT - CASSETTE BOARD (TOP VIEW)



PCB LAYOUT - CASSETTE BOARD (BOTTOM VIEW)

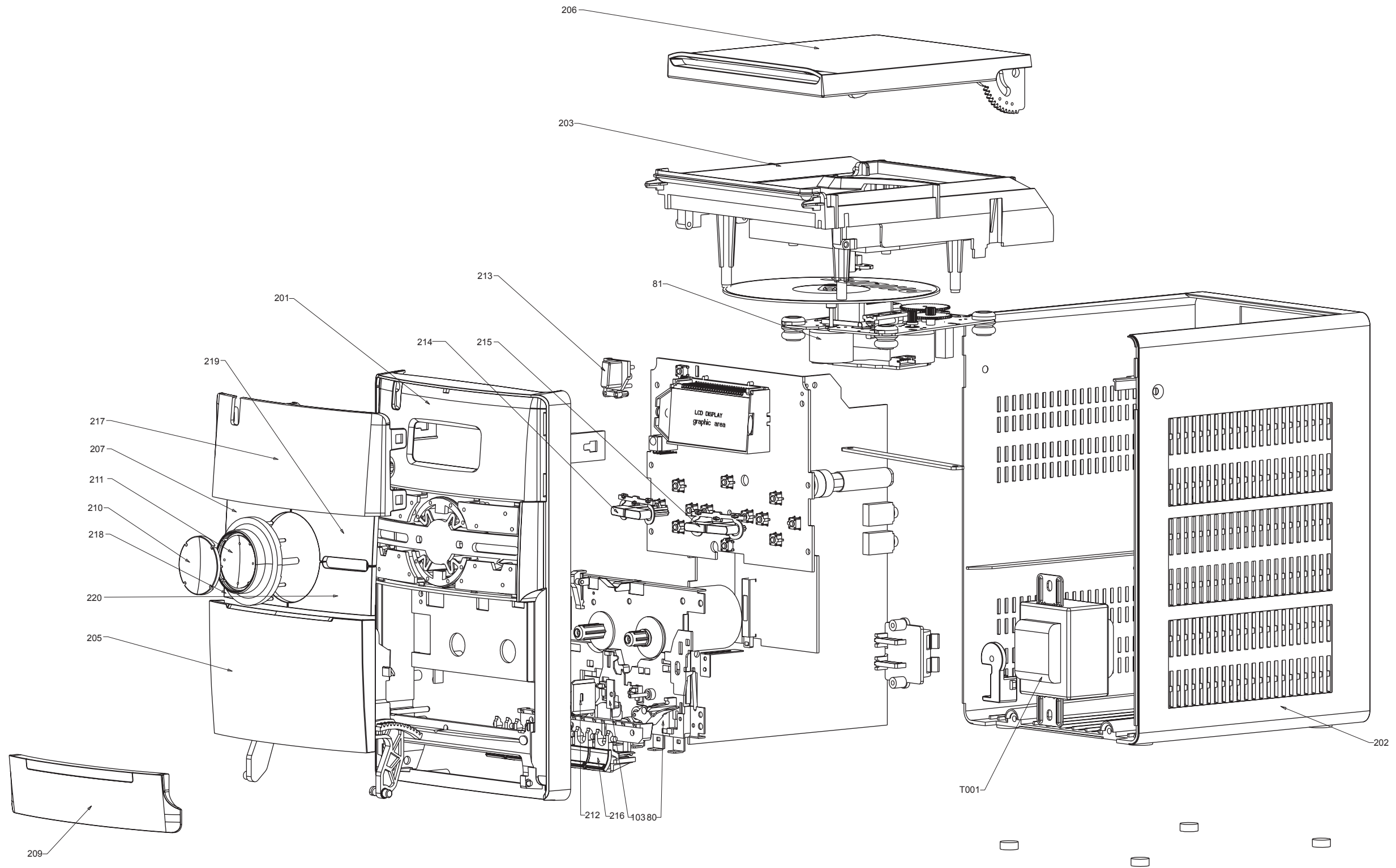


CIRCUIT DIAGRAM - CASSETTE BOARD



BIAS VOLTAGE : 13+/-1.5V
 BIAS FREQUENCY : 65+/-10KHz

SET MECHANICAL EXPLODED VIEW



MECHANICAL & ACCESSORIES PARTS LIST

2	996510010912	SINGLE SPK BOX	T001	△	996510007311	TRASFO. EI48 127/240V /98
6	996510006838	REMOTE CONTROL	T001	△	996510006839	TRASFO. EI48 230V /12/93/79/61/05
80	996510006840	CASS DECK JS-21FB8923-SGS				
81	994000005398	CD MECHANISM DA11B3VF				
103	996510006855	GEAR COVER PLATE (0.8T)				
105	996510006667	SPK GRILL				
108	996510000860	SHOCK ABSORBER (658 TA 30C)				
110	996510000861	SHOCK ABSORBER (658 TB 40C)				
112	996510006947	RECORDING PLATE				
114	994000003674	CD DOOR SPRING				
115	996510000917	CASS SPRING				
116	996510000918	CASSETTE KEY COVER SPRING				
201	996510006842	FRONT CABINET /12/93/61/98/05				
201	996510006945	FRONT CABINET /79				
202	996510006843	REAR CABINET /12/93/61/98/05				
202	996510006946	REAR CABINET /79				
203	996510006656	CD TRAY				
205	996510006844	CASSETTE DOOR				
206	996510006845	CD DOOR				
207	996510006849	SOURCE BUTTON COVER				
209	996510006846	CASS KEY DOOR				
210	996510006847	VOL COSMETIC COVER /12/79/98/61				
210	996510006659	VOL COSMETIC COVER /93/05				
211	996510006848	VOL BUTTON COVER				
212	994000001295	DAMPER GEAR ASS'Y				
213	996510006662	POWER BUTTON				
214	996510006663	PRESET BUTTON				
215	996510006664	REPEAT PROG BUTTON /12/79/61/98				
215	996510008375	PROGRAM/REPEAT BUTTON /93/05				
216	996510006853	CASS KEY WITH HOLDER				
217	996510006854	DISPLAY LENS				
218	996510006850	DBB BUTTON COVER				
219	996510006851	PLAY BUTTON COVER				
220	996510006852	STOP BUTTON COVER				
J001	994000004487	16P FFC 1MM L=170MM				
J002	996510000914	17P FLAT FLEX CABLE 1.25mm				
J008	996510006841	15P FFC 1mm L260mm				
J011	△	996510000909	AC CORD VDE APP 2M /12			
J011	△	994000000593	AC CORD SAA APP 2M /79			
J011	△	996510008399	AC CORD CCC APP 1.95M /93			
J011	△	996510008816	AC CORD CCC APP 1.83M /98			
J011	△	996510007312	AC CORD KS APP 1.92M /61			
J011	△	996510000859	AC CORD BS APP 2M /05			
J012	996510000910	FM ANT SMF-01T-1.3 L=1.1M				
S001	994000003093	CD DOOR SWITCH 1P1T DTS-03				

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

ELECTRICAL PARTS LIST - MAIN BOARD

111	996510002038	FM ANT CONTACT PIN	Q9	996500038609	TRANSISTORS 2W 8050C
112	996510002038	FM ANT CONTACT PIN	T2	996510006835	I.F.T 7mm 660R (RED)
C16	996510006833	E.CAP 3300UF 25V +-20%	T3	994000002861	I.F.T 7MM A049 (YELLOW)
CF1	996510006834	DISCRI.FILTER CDA10.7MG46-A	U101	994000003636	IC D8227 DIP
CF2	994000003642	CER. FILTER LT10.7MA5-A RED	U2	994000004532	IC KA7808E
CF3	994000002857	CERAMIC FILTER SFU450B	U33	996510003984	IC CYT78L05 (TO-92)
CON3	996510005450	SPK JACK PT-22V11A	VD1	994000002836	VARICAP DIODE 1SV-149
CT1	994000000254	TRIMMER 10PF 6MM (WH)	VD2	994000002836	VARICAP DIODE 1SV-149
CT2	994000000254	TRIMMER 10PF 6MM (WH)	VD3	994000004342	VARICAP DIODE V101
D6	994000003938	RECTIFIER DIODE RL-202	VD4	994000004342	VARICAP DIODE V101
D7	994000003938	RECTIFIER DIODE RL-202	X1	994000004551	CRYSTAL 16.9344MHZ +-20PPM
D8	994000003938	RECTIFIER DIODE RL-202			
D9	994000003938	RECTIFIER DIODE RL-202			
F1	△ 994000000586	GLASS FUSE W/LEAD 3.15A/250V			
IC1	996510006827	IC (SANYO) LA6541NHL-TE-L-E			
IC2	996500039806	IC ET2314 (SOP28)			
IC3	996510006828	IC (SANYO) LA9242M-MPB-E			
IC4	996510006829	IC (SANYO) LC78602RE-8616			
IC5	996510006832	IC (SANYO) LA1823			
JACK1	994000004369	PHONE JACK TC38-063-05-0			
JACK2	996510000889	PHONE JACK TC38-060-01 RING			
L001	996510006681	AM COIL AD/M7 65:20T			
L1	996500039350	FM COIL 4.5x2.5T (0.8mm)			
L7	994000003655	FM COIL 4.5X3.5T			
L8	994000003655	FM COIL 4.5X3.5T			
Q1	994000003937	TRANSISTORS PMBT3906			
Q10	996500038609	TRANSISTORS 2W 8050C			
Q11	994000004145	TRANSISTORS B772Y (160-320)			
Q12	994000004338	SMD TRANSISTORS PMBT3904			
Q13	994000003937	SMD TRANSISTORS PMBT3906			
Q14	996510003996	TRANSISTORS KTA1273			
Q15	996500038609	TRANSISTORS 2W 8050C			
Q16	996510006831	TRANSISTORS 9018F			
Q17	996510006831	TRANSISTORS 9018F			
Q18	996510006831	TRANSISTORS 9018F			
Q20	996500038609	TRANSISTORS 2W 8050C			
Q21	994000004338	SMD TRANSISTORS PMBT3904			
Q22	994000004145	TRANSISTORS B772Y (160-320)			
Q25	994000004338	SMD TRANSISTORS PMBT3904			
Q3	994000004338	SMD TRANSISTORS PMBT3904			
Q4	994000004338	SMD TRANSISTORS PMBT3904			
Q5	996500038609	TRANSISTORS 2W 8050C			
Q6	994000003937	SMD TRANSISTORS PMBT3906			
Q7	994000004338	SMD TRANSISTORS PMBT3904			
Q8	996510006830	TRANSISTORS 2SD882P			

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

ELECTRICAL PARTS LIST - FRONT BOARD

D41	996500042438	LED LAMP 2x5x7mm (WHITE)
L1	996510006837	AXIAL INDUCTOR 10UH +-10%
Q21	994000004338	SMD TRANSISTORS PMBT3904
Q26	994000004338	SMD TRANSISTORS PMBT3904
Q27	994000004338	SMD TRANSISTORS PMBT3904
Q6	994000003937	SMD TRANSISTORS PMBT3906
RE1	994000004367	OPTIC SENSER FM-6038TM2-5AN
SW1	994000001243	TACT SWITCH
SW10	994000001243	TACT SWITCH
SW11	994000001243	TACT SWITCH
SW12	994000001243	TACT SWITCH
SW13	994000001243	TACT SWITCH
SW2	994000001243	TACT SWITCH
SW3	994000001243	TACT SWITCH
SW4	994000001243	TACT SWITCH
SW5	994000001243	TACT SWITCH
SW6	994000001243	TACT SWITCH
SW7	994000001243	TACT SWITCH
SW8	994000001243	TACT SWITCH
SW9	994000001243	TACT SWITCH
U1	994000004541	IC M24C02-WMN6
U3	996510006836	MCU GY550 (OTP)
XT1	994000004616	CRYSTAL 4.500MHZ
XT2	996500042441	X'TAL 32.768KHZ -20PPM
LCD1	996510008371	LCD DISPLAY SDH-DA1607-TN-1

ELECTRICAL PARTS LIST - CASS BOARD

IC505	994000004533	IC YD7312
L25	994000004538	I.F.T 10148BK7
Q511	994000004338	TRANSISTORS PMBT3904
Q512	996500038609	TRANSISTORS 2W 8050C
SW201	994000003656	PUSH SWITCH PS-102D13-NS

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

REVISION LIST

1.0 Manual 3141 785 32140

Initial Service Manual released.

1.1 Manual 3141 785 32141

In this version,

- 1) Chapter7 Cassette Board is added.

1.2 Manual 3141 785 32142

In this version, version /05 & /98 added.

- 1) Page 8-2 Mechanical & Accessories Parts List updated.
- 2) Page 9-2 LCD1_996510008371_ LCD DISPLAY SDH-DA1607-TN-1 added.

1.3 Manual 3141 785 32143

In this version,

- 1) Page 8-2 Mechanical & Accessories Parts List updated. 12NC of Single Speaker Box changed as below.
2 996510010912 SINGLE SPEAKER BOX (was 996510006856)