

Service
Service
Service



Service Manual



TABLE OF CONTENTS

Handling chip components..... 1-1
 Service tools..... 1-1
 Leadfree and safety information 1-2
 Technical specification 2-1
 Service measurement setup 2-2
 Connections and controls 3-1...3-2

Disassembly diagram..... 4-1...4-2
 Set block diagram 5-1
 Set wiring diagram 5-2

Circuit Diagram (part 1)
 Circuit diagram (CPU / Display board) 6-1
 Circuit diagram (AMP / Power board) 6-2

Layout Diagram - CPU/Display & AMP/Power boards
 Top view 6-3
 Bottom view..... 6-4

Circuit Diagram (part 2)
 Circuit diagram - Cassette part 7-1
 Circuit diagram - CD/MP3 part..... 7-2
 Circuit diagram - Tuner/Audio part 7-3

Layout Diagram (main combi board)
 Top view 8-1
 Bottom view 8-2

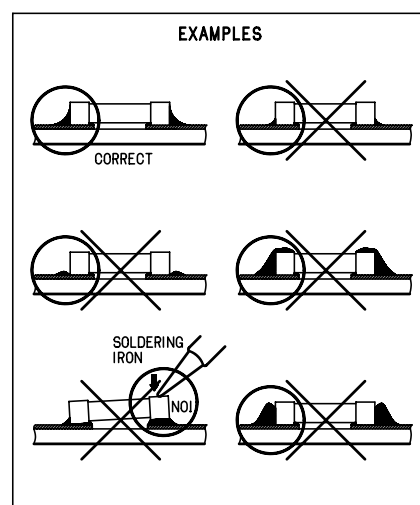
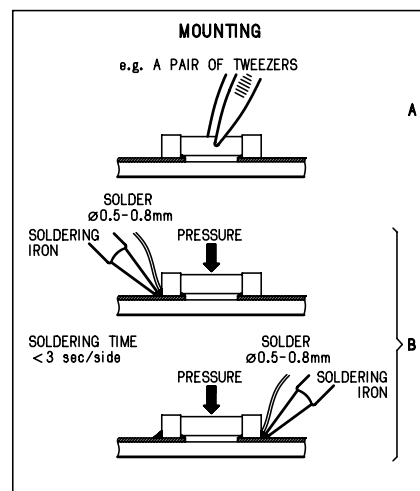
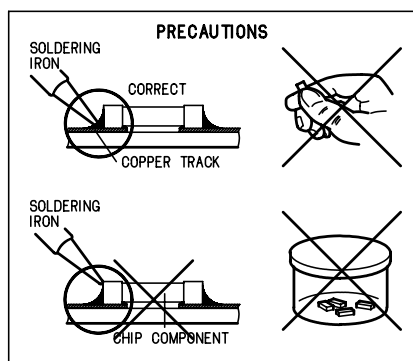
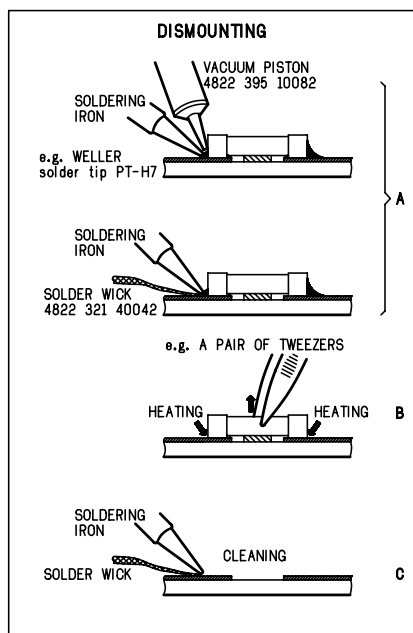
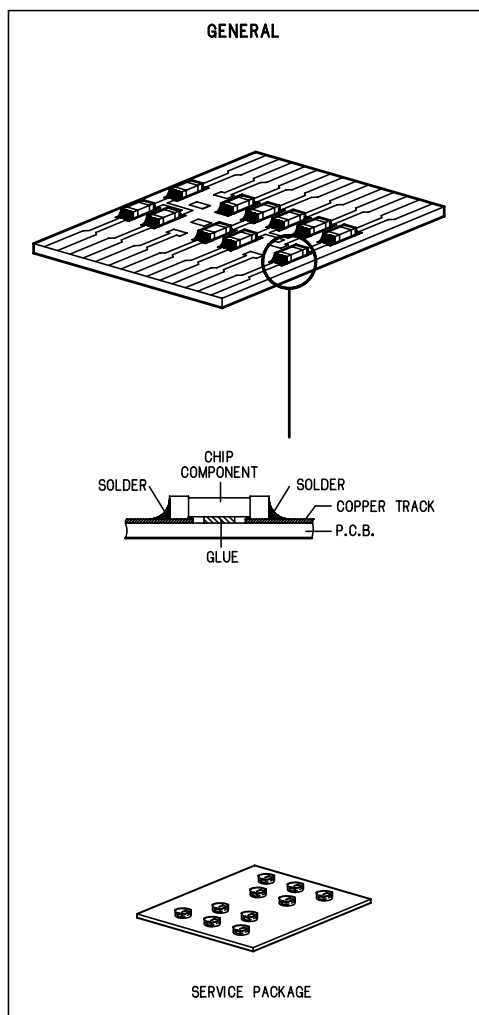
Exploded view diagram 9-1
 Accessories and Mechanical partslist..... 9-2

Electrical partslist 10-1...10-3

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HANDLING CHIP COMPONENTS



SERVICE TOOLS

- TORX T10 screwdriver with shaftlength 150mm.....4822 395 50423
- TORX screwdriver set SBC 163.....4822 295 50145
- Audio signal disc SBC 429.....4822 397 30184
- Playability test disc SBC 444.....4822 397 30245
- Test disc 5 (disc without errors) +
- Test disc 5A (disc with dropout errors, black spots and fingerprints)
SBC 426/426A.....4822 397 30096
- Burn in test disc (65 min. 1kHz signal at -30 dB level without "pause").....4822 397 30155
- Universal test cassette Fe SBC 420.....4822 397 30071

AVAILABLE ESD PROTECTION EQUIPMENT

- anti-static table mat large 1200x650x1.25mm 4822 466 10953
- small 600x650x1.25mm 4822 466 10958
- anti-static wristband 4822 395 10223
- connection box (3 press stud connections, 1MΩ) 4822 320 11307
- extendible cable (2m, 2MΩ, to connect wristband to connection box) 4822 320 11305
- connecting cable (3m, 2MΩ, to connect table mat to connection box) 4822 320 11306
- earth cable (1MΩ, to connect any product to mat or to connection box) 4822 320 11308
- KIT ESD3 (combining all 6 prior products - small table mat) 4822 310 10671
- wristband tester 4822 344 13999

INFORMATION ABOUT LEAD-FREE SOLDERING

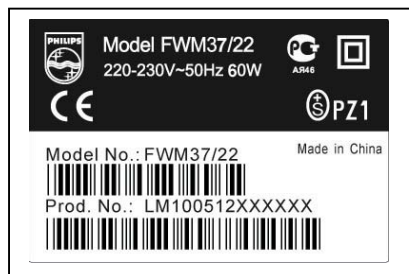
Philips CE is producing lead-free sets from 1.1.2005 onwards.

IDENTIFICATION:

Regardless of special logo (not always indicated) one must treat all sets from 1 Jan 2005 onwards, according next rules:



Example S/N:



Bottom line of typeplate gives a 14-digit S/N. Digit 5&6 is the year, digit 7&8 is the week number, so in this case 2005 wk12

So from 0501 onwards = from 1 Jan 2005 onwards

Important note: In fact also products of year 2004 must be treated in this way as long as you avoid mixing solder-alloys (lead/ lead-free). So best to always use SAC305 and the higher temperatures belong to this.

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
 - To reach at least a solder-temperature of 400°C,
 - To stabilize the adjusted temperature at the solder-tip
 - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free).
If one cannot avoid or does not know whether product is lead-free, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- **Special information for BGA-ICs:**
 - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use the lead-free temperature profile, in case of doubt)
 - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website. Do not re-use BGAs at all.
- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.
- 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

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.

SPECIFICATION

GENERAL:

Mains voltage /05/12 : 220-240V
 /55/77/78 : 110-127/220-240V Switchable
 Mains frequency
 /05/12 : 50 Hz
 /55/77/78 : 50/60 Hz
 Power consumption : < 50W max.
 < 5W at standby
 Clock accuracy : 2 seconds per day
 Dimension center unit : 220 x 292 x 285 mm
 Dimension speaker : 190 x 292 x 182 mm
 Weight (with/without speaker box)
 : 4.9 /2.3 Kgs

TUNER:**FM**

Tuning range : 87.5 – 108 MHz
 IF Frequency : 10.7 MHz \pm 20kHz
 Aerial input : 75 Ω pigtail wire
 Sensitivity at 26sb S/N : < 18 μ V
 Selectivity at 600 kHz
 Bandwidth : > 25 dB
 IF rejection : > 75 dB
 Image rejection : > 25 dB
 Distortion : < 3%
 Crosstalk : > 18 dB

MW

Tuning range
 9 kHz grid : 531 – 1602 kHz
 10 kHz grid : 530 – 1700 kHz
 IF Frequency : 455 kHz \pm 1kHz
 Aerial input : Loop antenna
 Sensitivity at 26sb S/N : < 4.0 mV/M
 Selectivity at 18 kHz
 Bandwidth : > 18 dB
 IF rejection : > 45 dB
 Image rejection : > 28 dB
 Distortion : < 5%

AMPLIFIER:

Output power : 2 x 20 W RMS
 Speaker impedance : 8 ohm
 Frequency response
 Within \pm 3dB : 63Hz – 16 kHz
 Hyper bass sound ON : 8dB \pm 3dB at 125Hz
 Digital sound control : Rock/Pop/Jazz/Classic
 Headphone output : 32 mW \pm 2dB at 32 Ω

CASSETTE RECORDER:

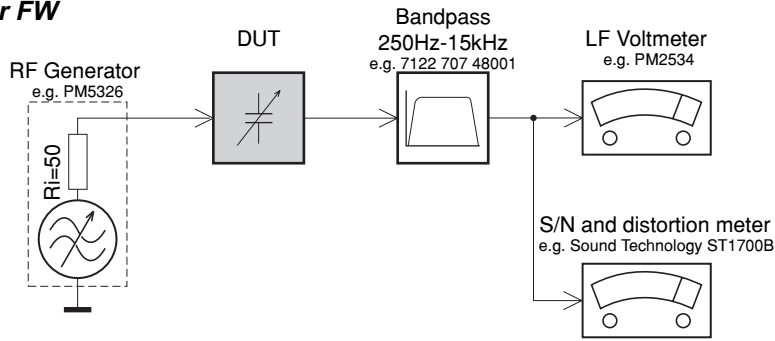
Number of tracks : 2 x 2 stereo
 Tape speed : 4.76 cm/sec +2.5/-1.5%
 Wow and flutter : < 0.4% DIN
 Fast-wind/rewind time : < 130 sec. With C-60
 Bias frequency : 75 \pm 10 kHz
 R/P frequency response : 125 – 8 kHz (8 dB)
 Signal to noise ratio : > 35 dB with type 1 tape

COMPACT DISC:

Number of programming track : 32
 Frequency response
 Within \pm 1.5 dB : 20 Hz – 20 kHz
 Signal/Noise ratio : 50 dB/A-weighted
 Distortion at 1 kHz : < 3%
 Channel separation at 1 kHz : > 25 dB
 Support disc format :
 Disc format ISO9660, single session CD
 Max albums: 99, max. titles: 511
 Supported sampling frequencies: 32 kHz, 44.1 kHz, 48 kHz
 Bit rate : 32 – 256 (128 bits recommended)

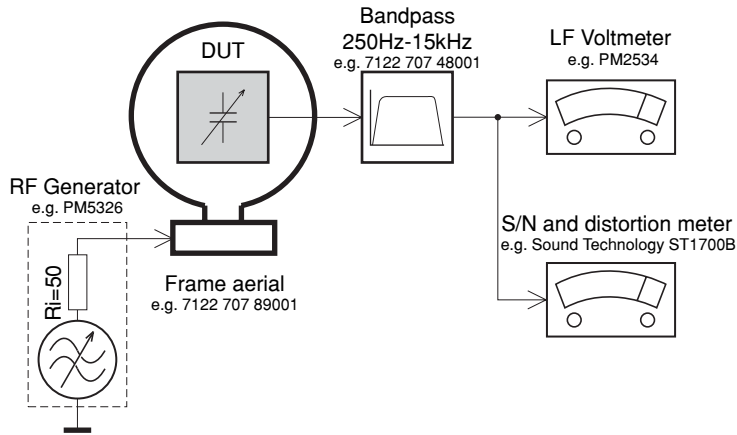
SERVICE MEASUREMENT

Tuner FW



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

Tuner AM (MW,LW)



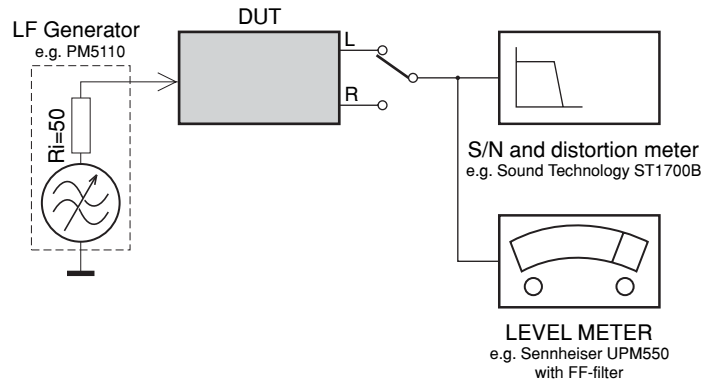
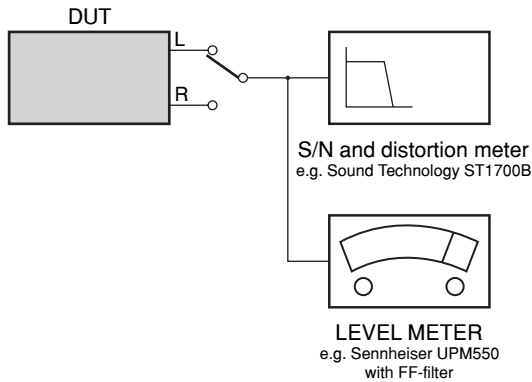
To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday cage. Use a bandpass filter (or at least a high pass filter with 250kHz) to eliminate hum (50Hz, 100Hz).

CD

Use Audio Signal Disc SBC429 4822 397 30184 (replaces test disc 3)

RECORDER

Use Universal Test Cassette Fe SBC420 4822 397 30071

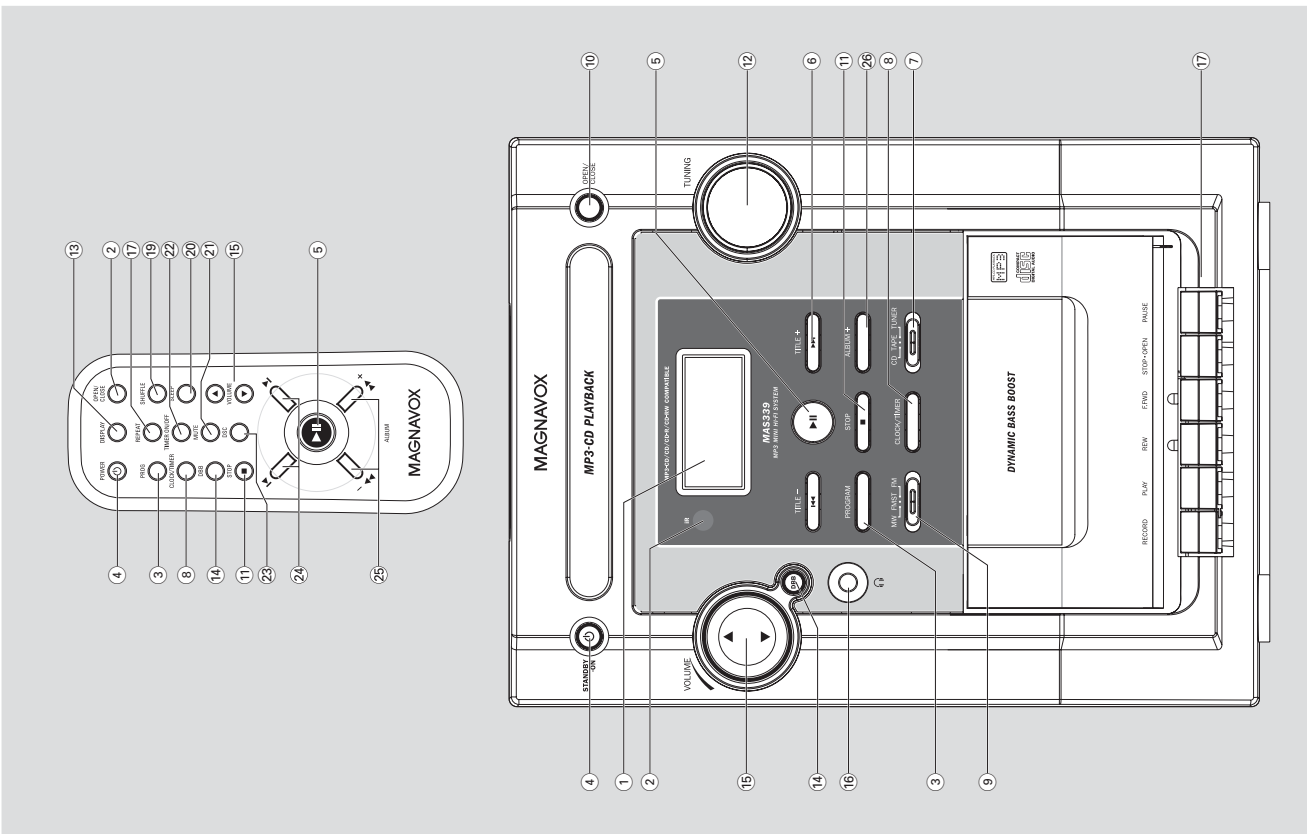


CONNECTION AND CONTROLS

Controls (illustrations on page 3)

- 16 connect headphones.
- 17 **Tape Deck Operation**
- RECORD ●** starts recording.
- PLAY ▶** starts playback.
- REW ◀◀/F.FWD ▶▶** fast rewinds/forwards the tape.
- STOP•OPEN ■** stops the tape; opens the tape compartment.
- PAUSE II** pauses recording or playback.
- 18 **REPEAT** for CD/MP3 repeats a track/CD programme/entire CD.
- 19 **SHUFFLE** for CD/MP3 plays CD tracks in random order.
- 20 **SLEEP** activates/deactivates or selects the sleeper time.
- 21 **MUTE** switches playback sound off and on.
- 22 **TIMER ON/OFF** activates/deactivates the timer.
- 23 **DSC (Digital Sound Control)** selects sound characteristics: CLASSIC/JAZZ/POP/ROCK.
- 24 **◀/▶** for CD/MP3 skips to the beginning of a current track/previous/next track (title).
- for CD/MP3 (press and hold) fast searches back and forward within a track/CD.
- for clock/timer adjusts the hours and minutes for clock/timer functions.
- 25 **ALBUM+/-◀/▶** for MP3 selects an album.
- 26 **ALBUM+** for MP3 selects an album upward.

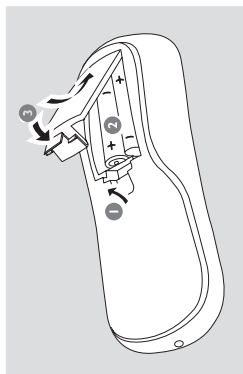
- Controls on the system and remote control**
- 1 **LCD Display** shows the status of the system.
- 2 **IR SENSOR** infrared sensor for remote control.
- 3 **PROGRAM (PROG)** for CD programs tracks and reviews the program.
- 4 **STANDBY-ON (POWER ⏻)** switches the system to standby/on.
- 5 **▶▶** for CD/MP3 starts or pauses CD playback.
- 6 **TITLE+/-◀◀/▶▶** for CD/MP3 skips to the beginning of a current track/previous/next track (title).
- (press and hold) fast searches back and forward within a track/disc.
- for clock/timer adjusts the hours and minutes for clock / timer functions.
- 7 **Source selector (CD/TAPE/TUNER)** selects the respective sound source for: CD/TAPE/TUNER.
- 8 **CLOCK/TIMER** sets the clock or timer function.
- 9 **Band selector (MW/FMST/FM)** for Tuner selects waveband: MW, FM (stereo) or FM (mono).
- 10 **OPEN/CLOSE** open/close the CD door.
- 11 **STOP ■** for CD/MP3 stops CD playback or erases a CD program.
- 12 **TUNING** tunes to a radio station.
- 13 **DISPLAY** display the current time.
- 14 **DBB (Dynamic Bass Boost)** enhances the bass.
- 15 **VOLUME ▲▼** adjusts the volume level.



Preparations

Inserting batteries into the remote control

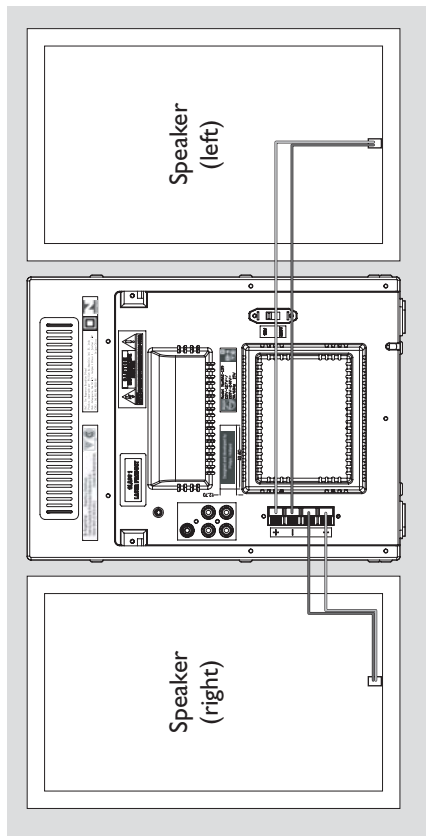
Insert two batteries type R03 or AAA into the remote control with the correct polarity as indicated by the "+", and "-", symbols inside the battery compartment.



CAUTION!

- Remove batteries if they are exhausted or will not be used for a long time.
- Do not use old and new or different types of batteries in combination.
- Batteries contain chemical substances so they should be disposed of properly.

Preparations



Rear connections

The top plate is located at the back of the system.

(A) Power

- Before connecting the AC power cord to the wall outlet, ensure that all other connections have been made.
- If your system is equipped with a Voltage Selector, set the VOLTAGE SELECTOR to the local power line voltage.

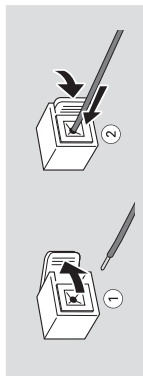
WARNING!

- For optimal performance use only the original power cable.
- Never make or change any connections with the power switched on.

(B) Speakers Connection

Front Speakers

Connect the speaker wires to the SPEAKERS terminals, right speaker to "+" and left speaker to "L"; coloured (marked) wire to "+" and black (unmarked) wire to "-".



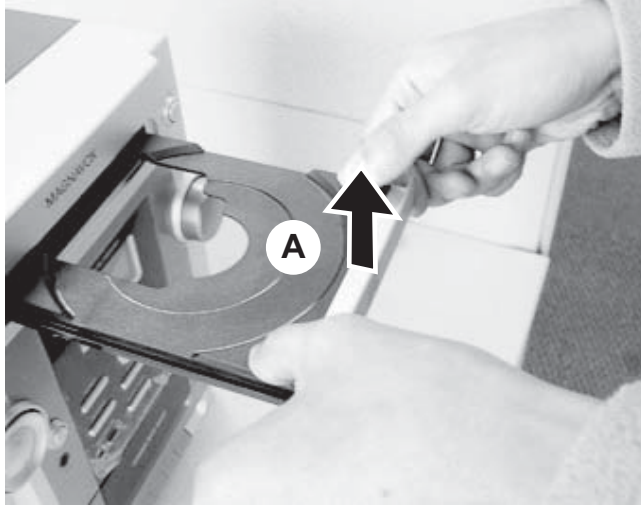
- Fully insert the stripped portion of the speaker wire into the terminal as shown.

Notes:

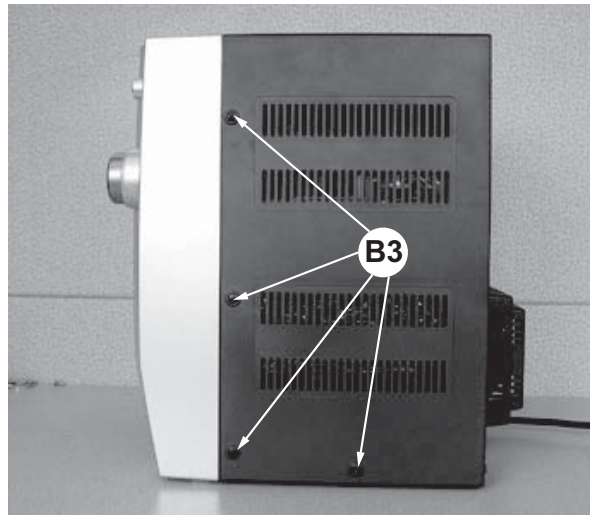
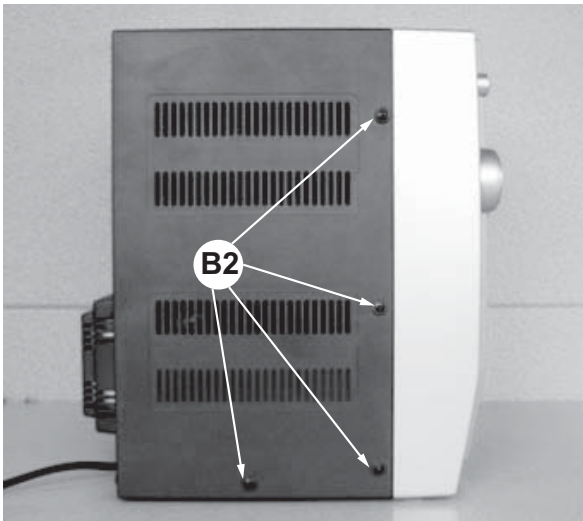
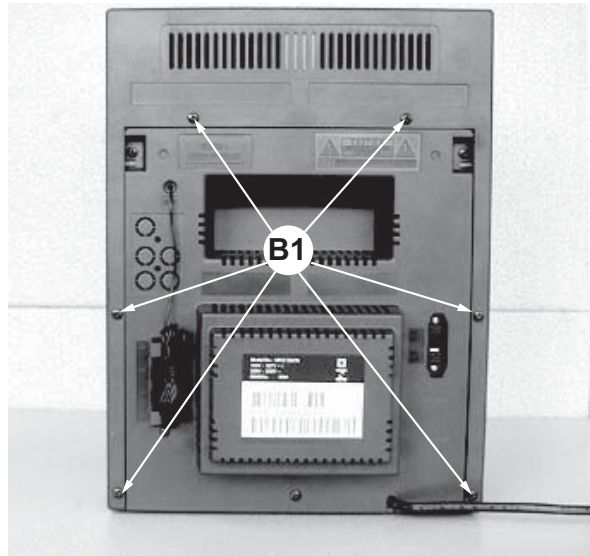
- For optimal sound performance, use the supplied speakers.
- Do not connect more than one speaker to any one pair of + / - speaker terminals.
- Do not connect speakers with an impedance lower than the speakers supplied. Please refer to the SPECIFICATIONS section of this manual.

DISASSEMBLY DIADRAMS

- A. Switch on the set.
Press OPEN/CLOSE to open the CD Tray.
Remove CD Door.



- B. Remove Top Cabinet
B1: Remove screws SP 3x12 - 6 pcs.
B2: Remove screws SP 3x12 - 4 pcs.
B3: Remove screws SP 3x12 - 4 pcs.



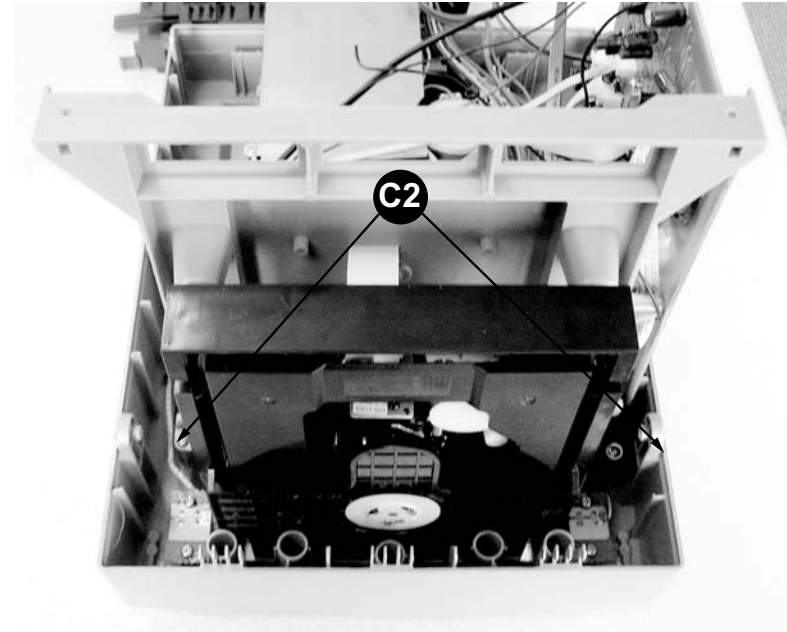
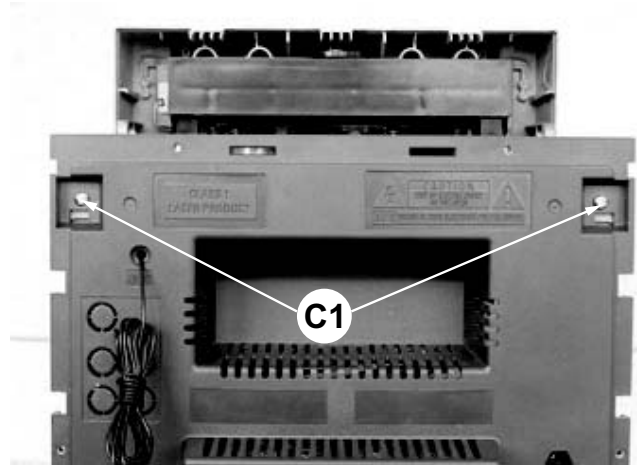
DISASSEMBLY DIADRAMS

C. Remove CD Loader

C1: Remove screws SP 3x12 - 2 pcs.

C2: Remove screws SP 3x15 - 2 pcs.

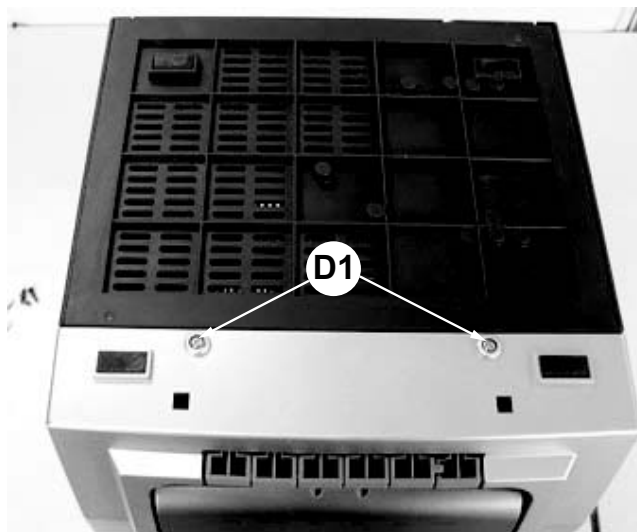
C3: Remove screws SP 3x10 - 1 pcs.



D. Remove Bottom Cabinet

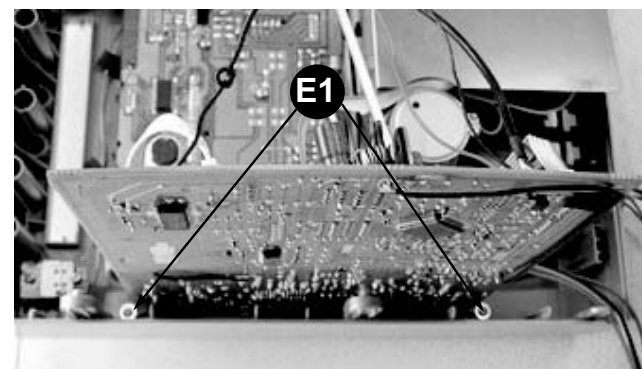
Solder out the FM antenna wire.

D1: Remove screws SP 3x12 - 2 pcs.



E. Remove Main PCB Assy

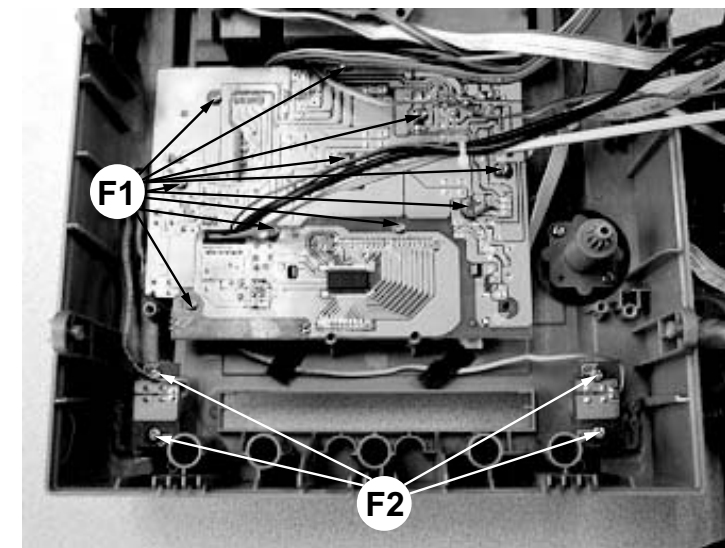
E1: Remove screws SP 3x10 (Washer head) - 2 pcs.



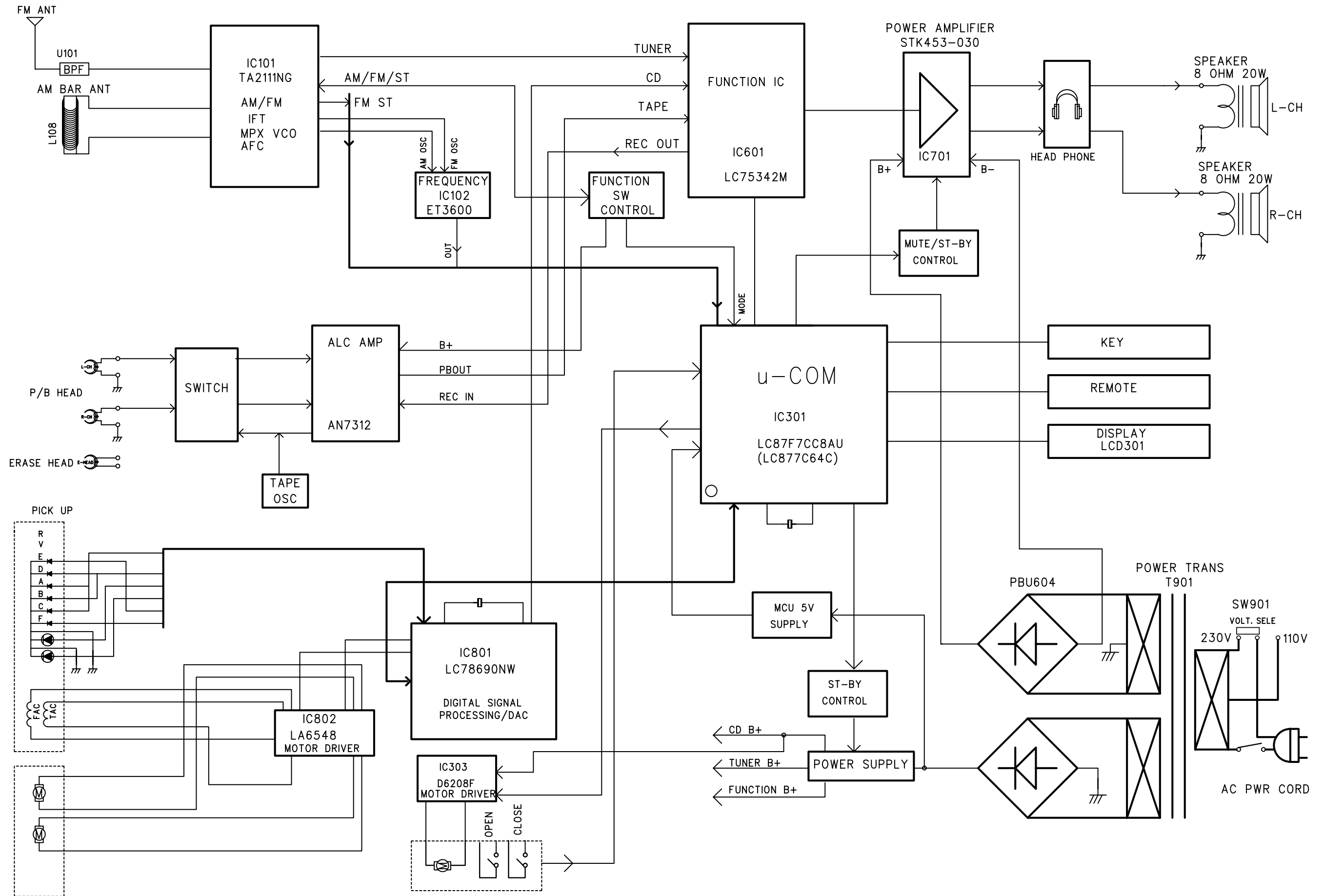
F. Remove Key Board Assembly

F1: Remove screws SP 3x10 - 10 pcs.

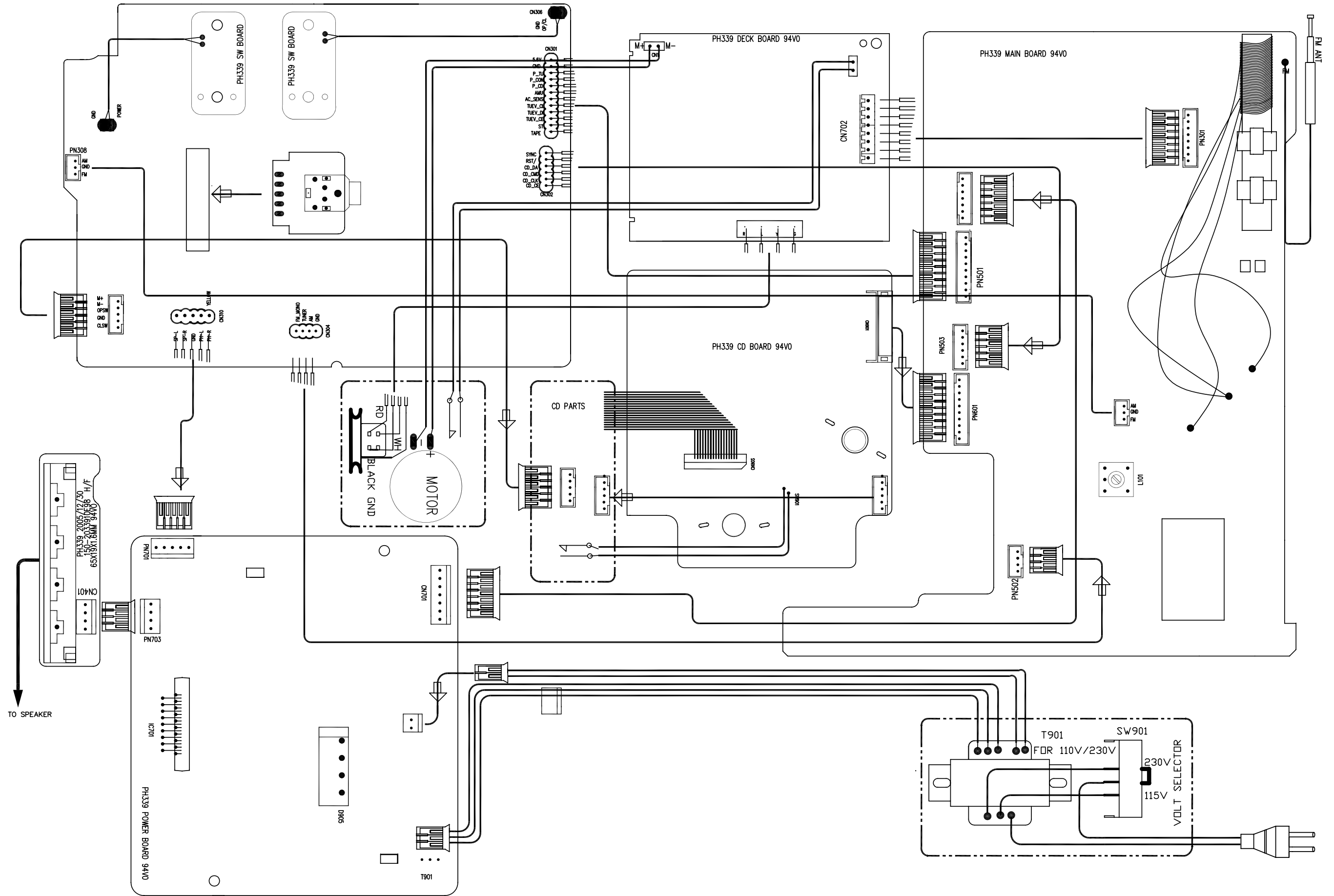
F2: Remove screws SP 3x10 - 4 pcs.



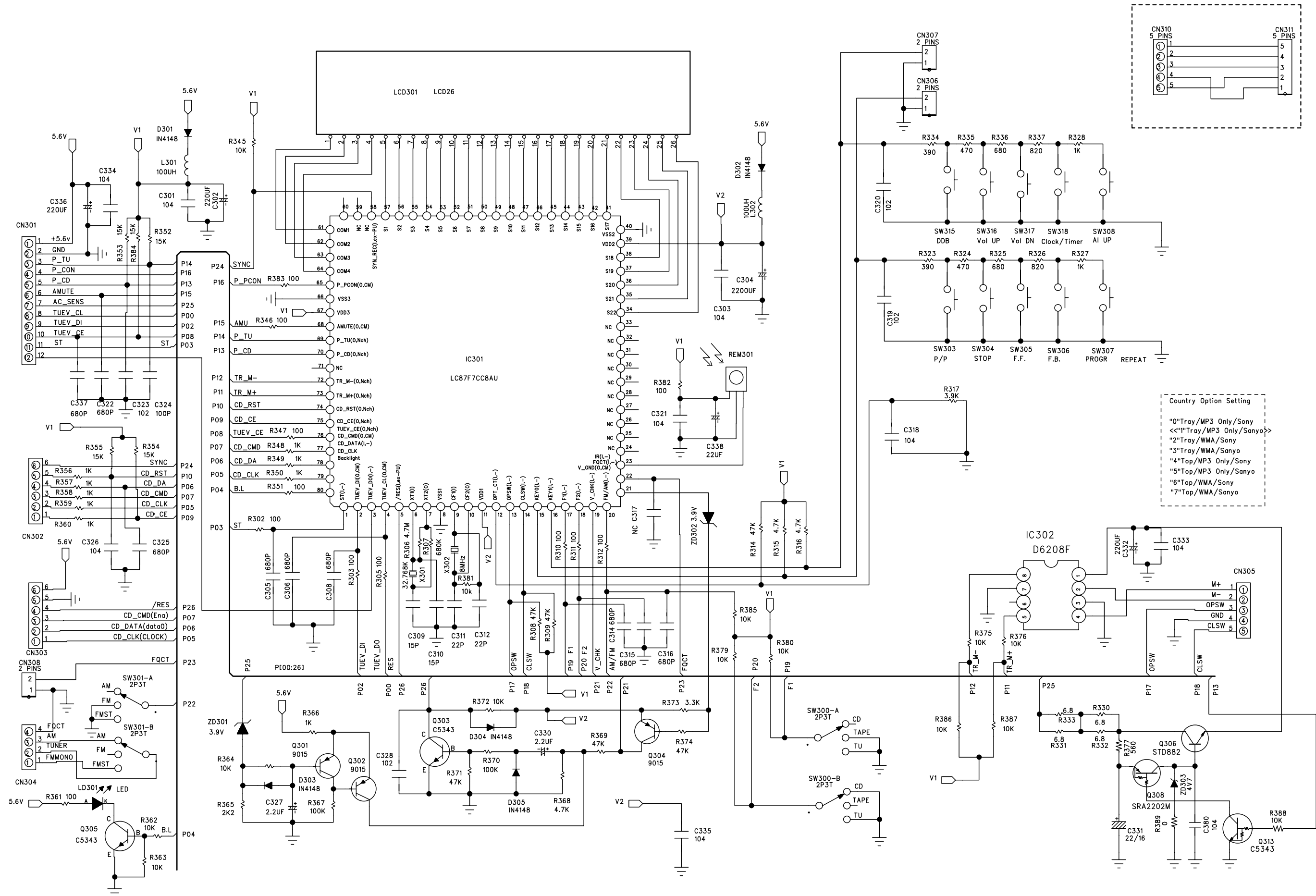
SET BLOCK DIAGRAM



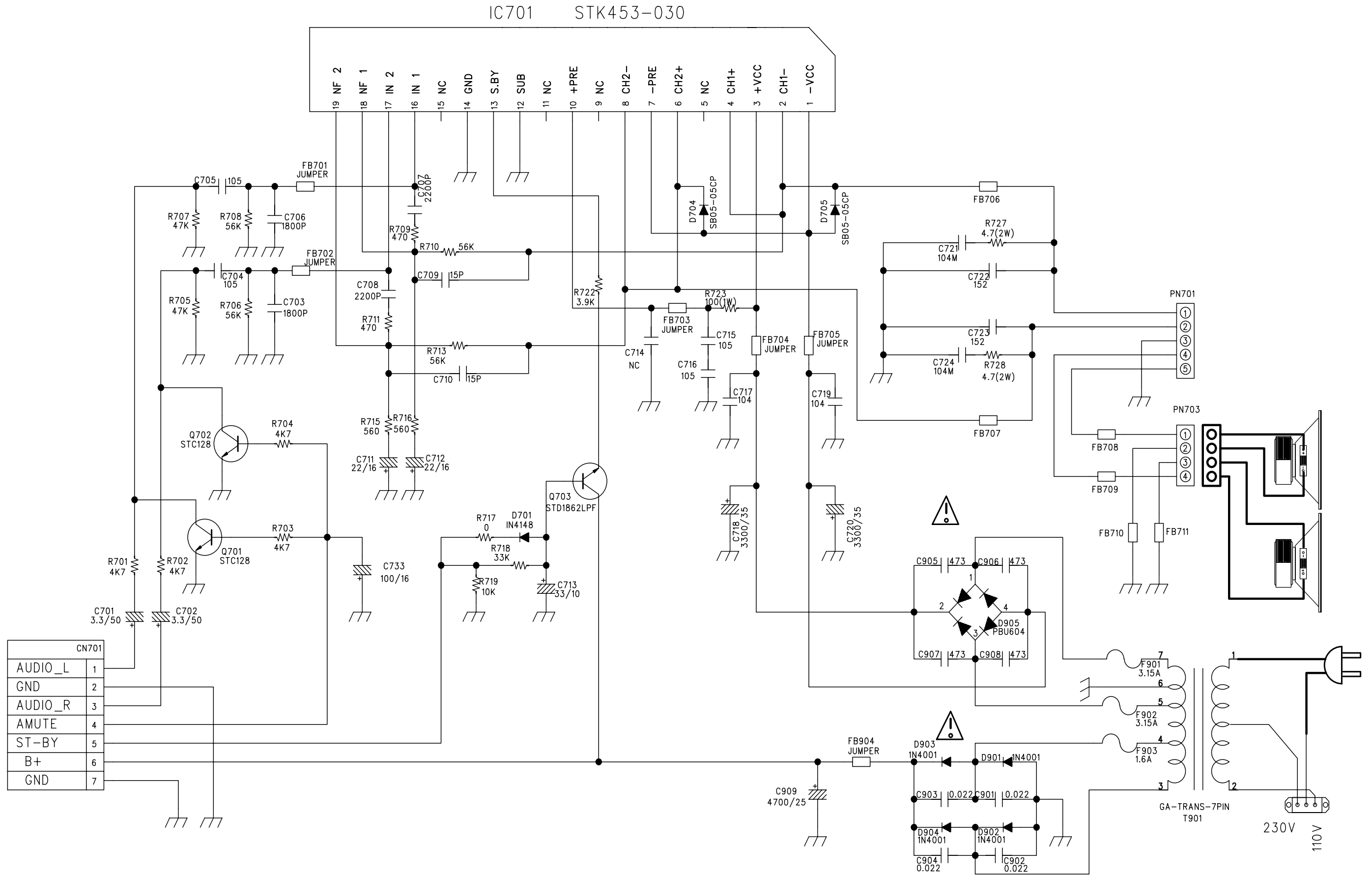
SET WIRING DIAGRAM



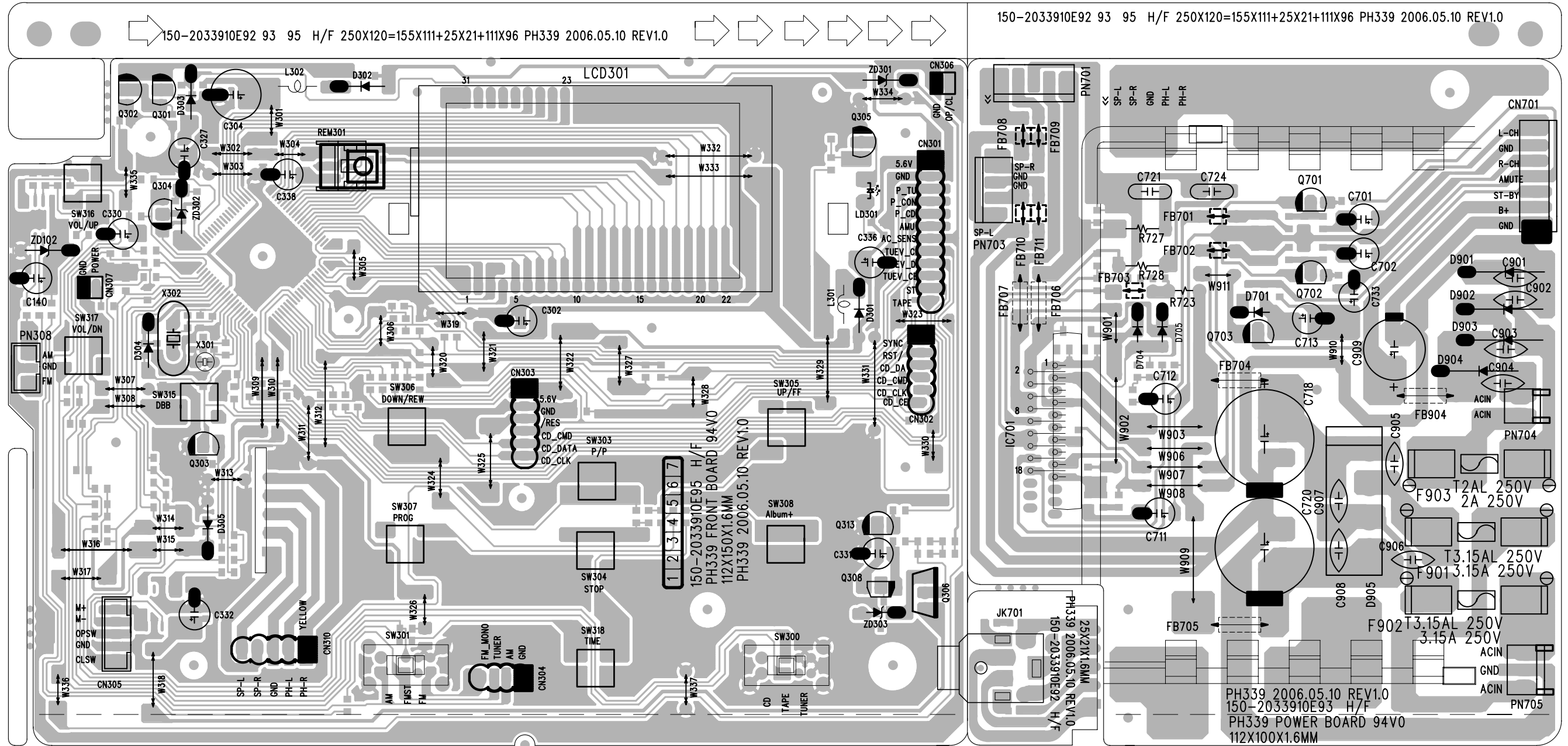
CIRCUIT DIAGRAM - CPU DISPLAY BOARD



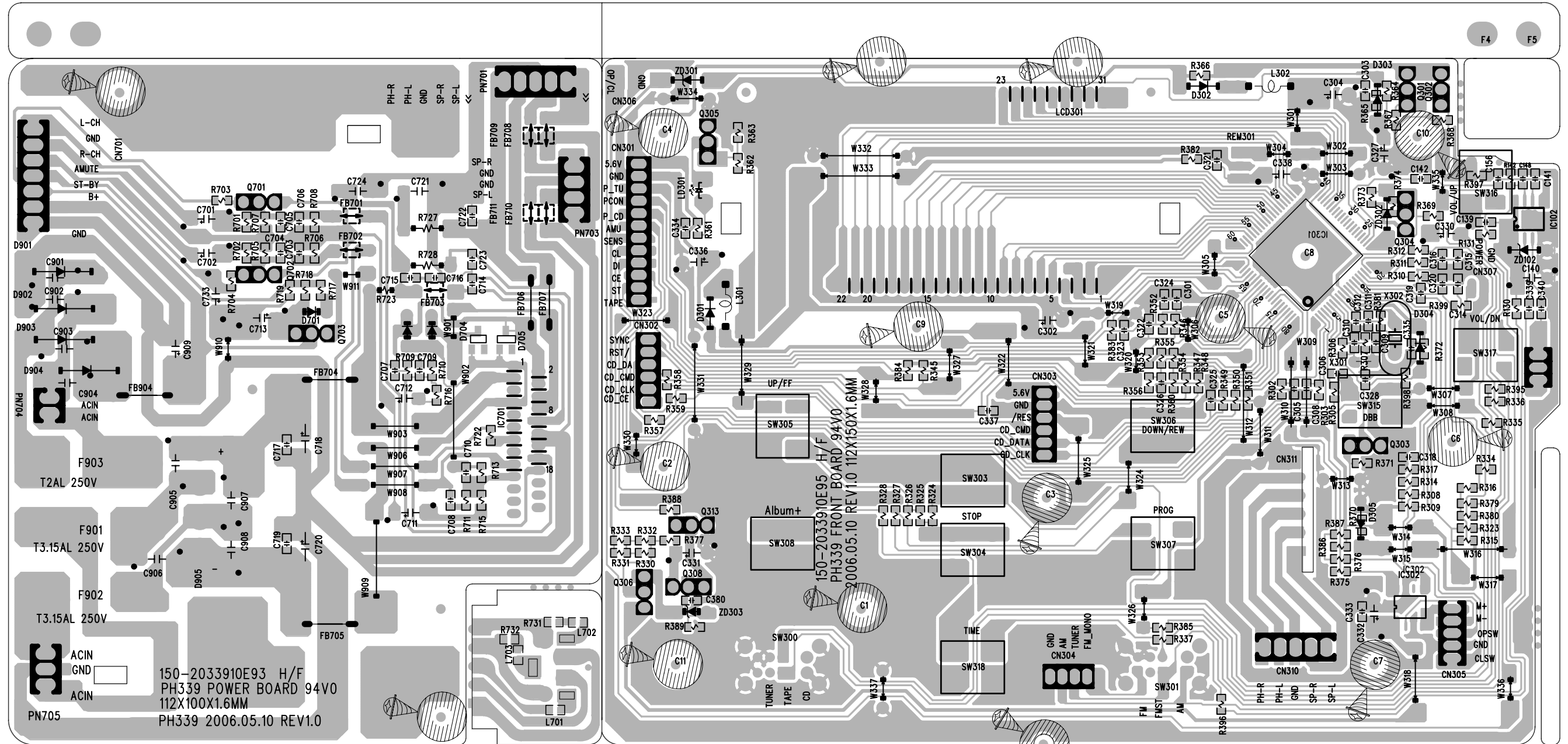
CIRCUIT DIAGRAM - AMP / POWER BOARD



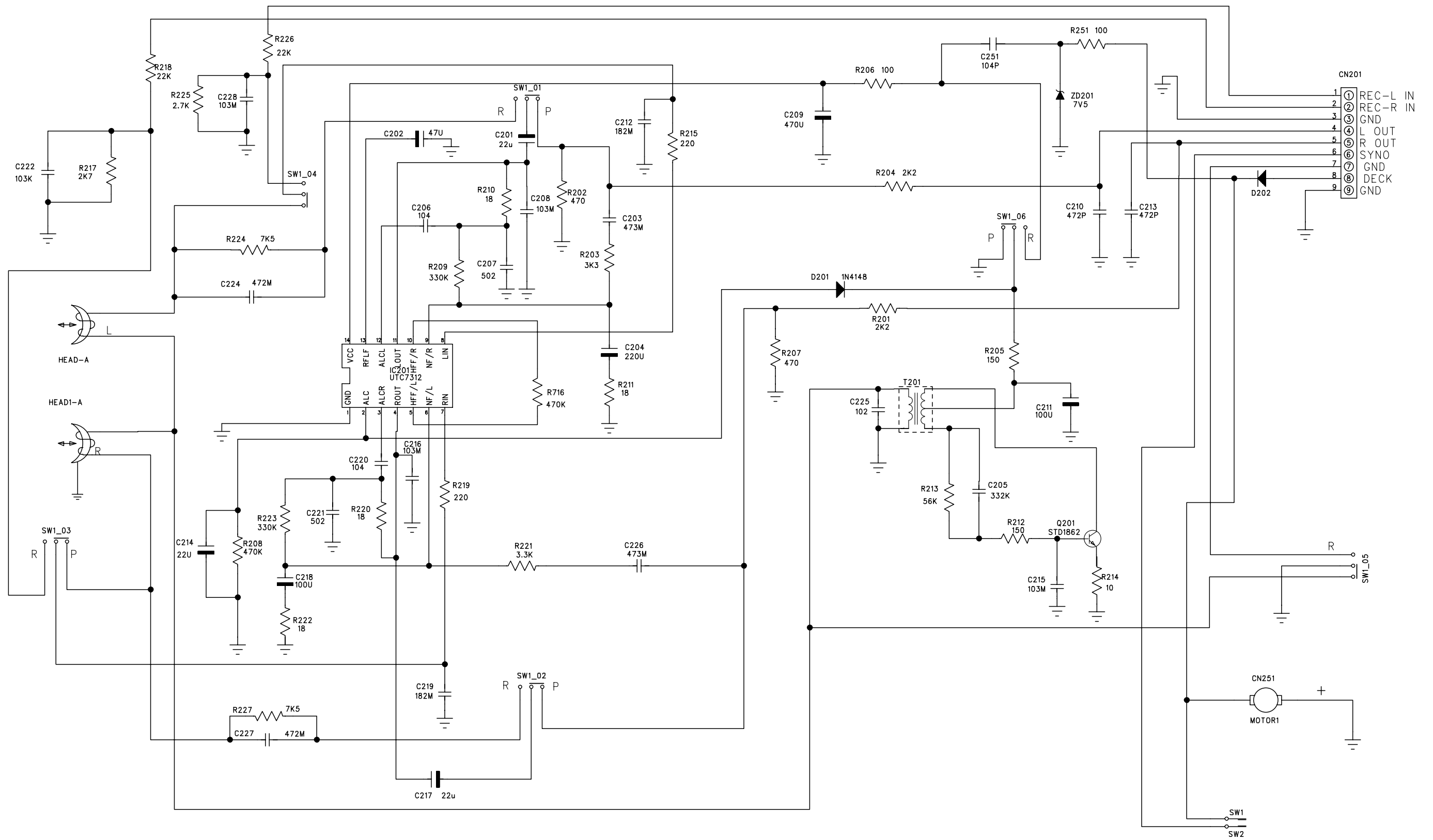
LAYOUT DIAGRAM - CPU / DISPLAY & AMP / POWER BOARD (TOP VIEW)



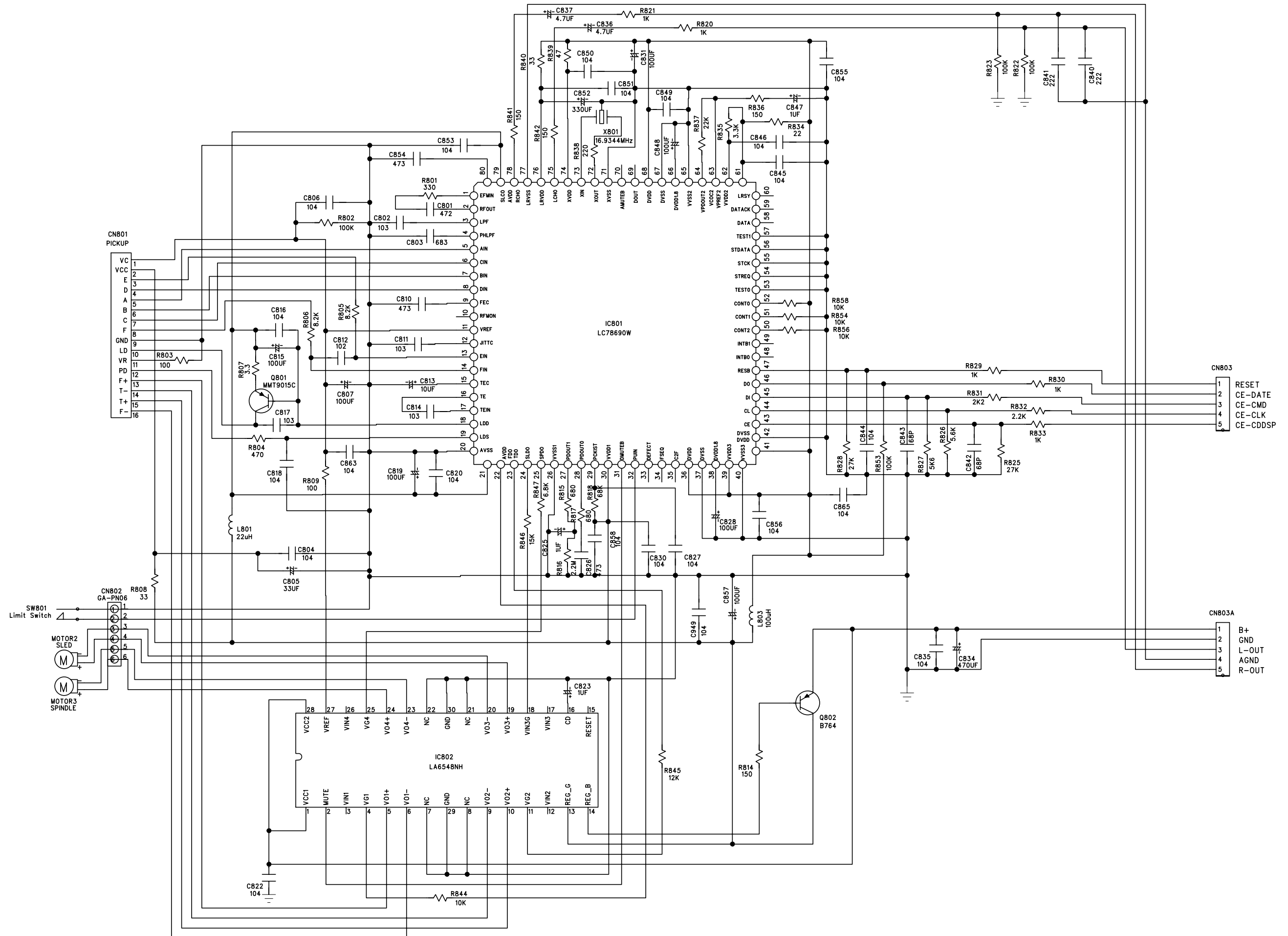
LAYOUT DIAGRAM - LAYOUT DIAGRAM - CPU / DISPLAY & AMP / POWER BOARD (BOTTOM VIEW)



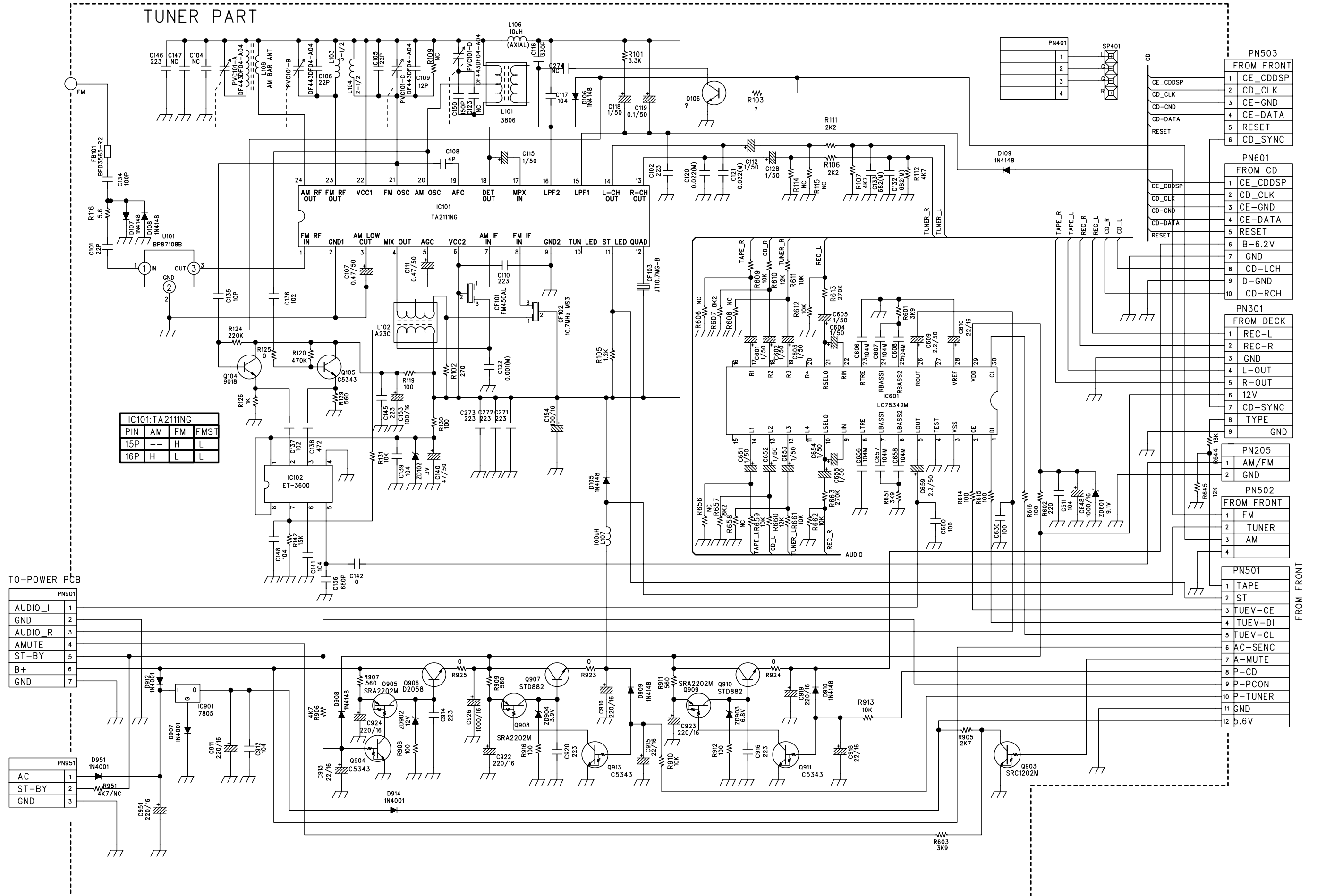
CIRCUIT DIAGRAM - CASSETTE PART



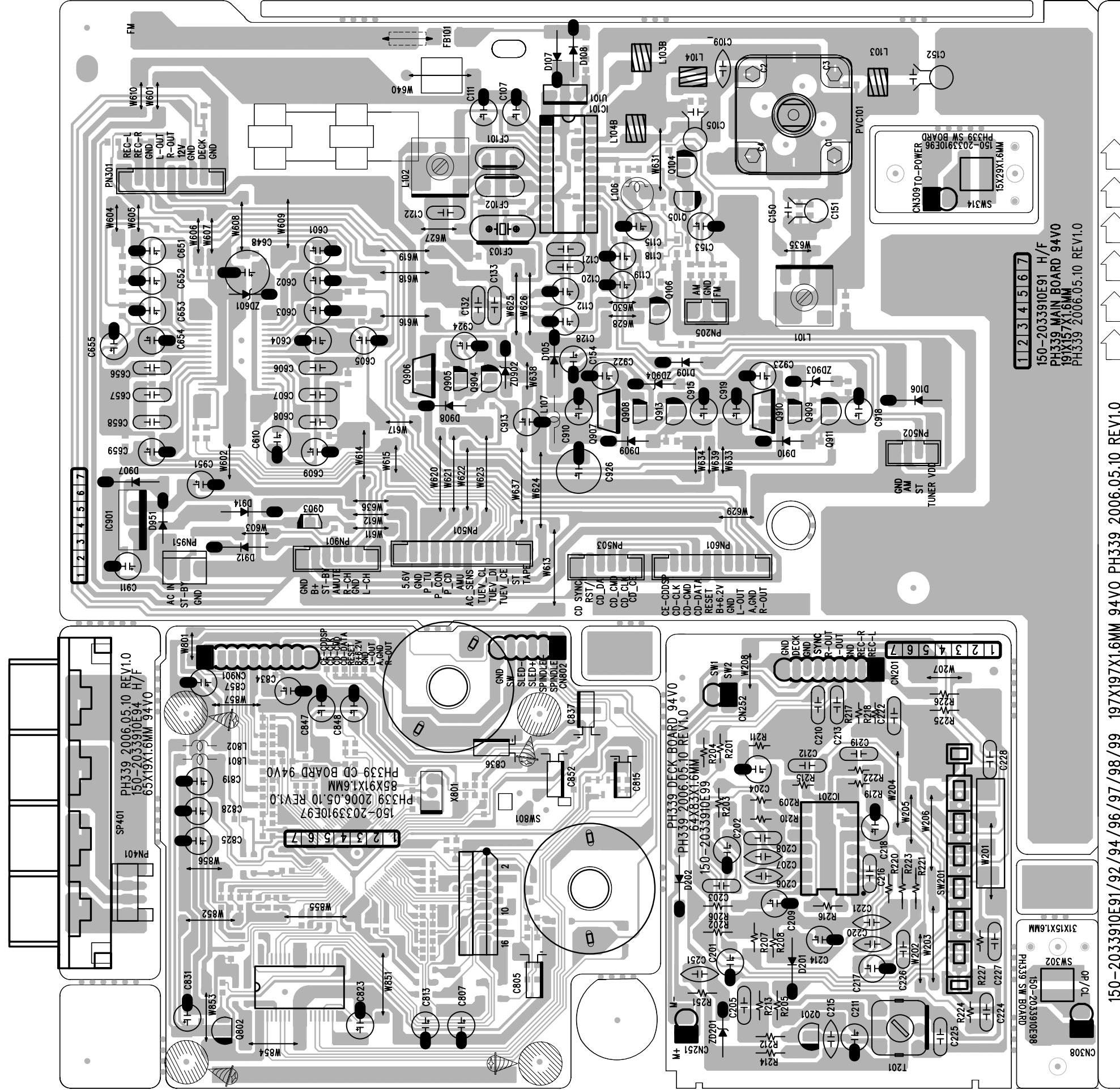
CIRCUIT DIAGRAM - CD / MP3 PART



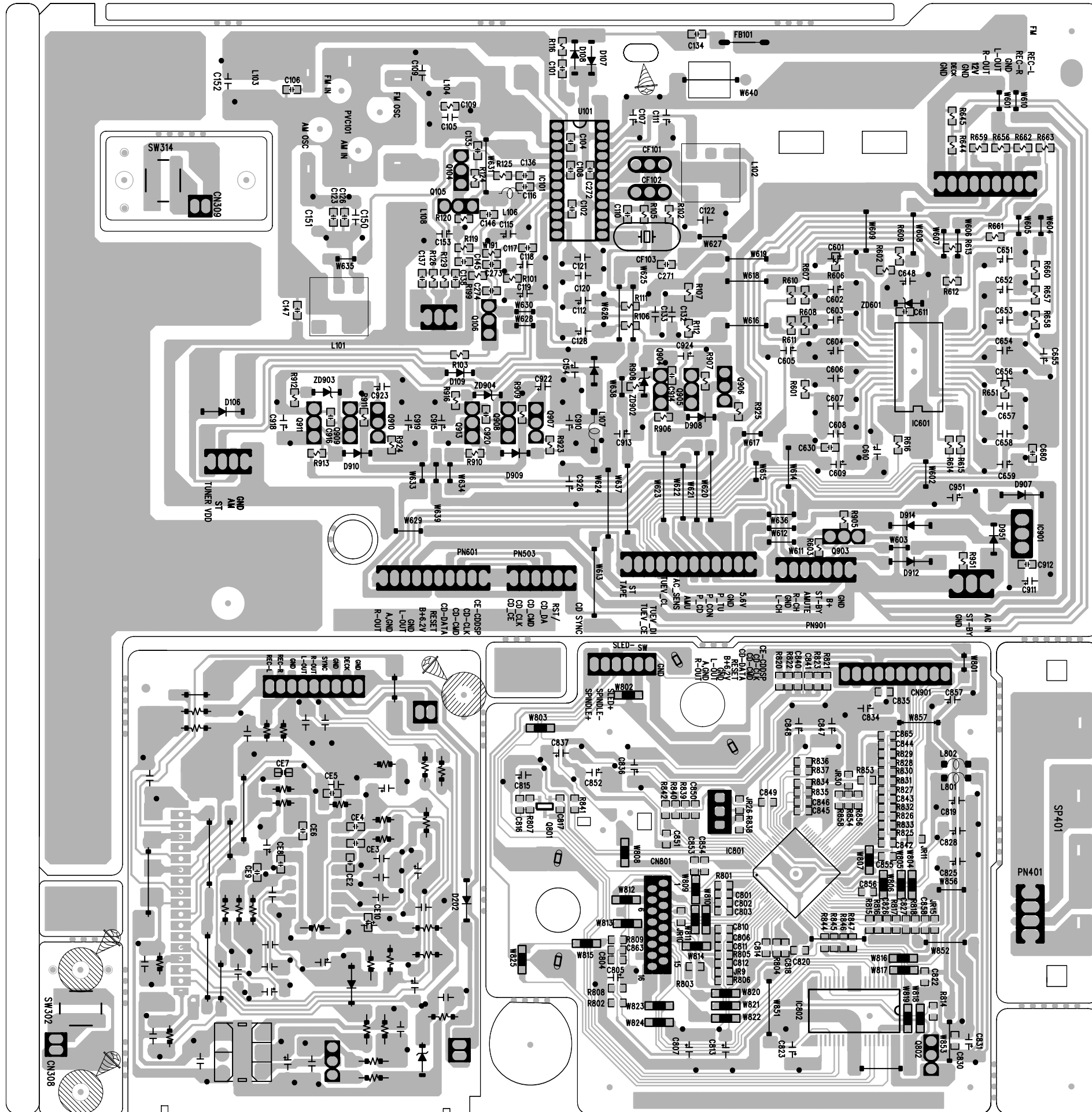
CIRCUIT DIAGRAM - TUNER / AUDIO PART



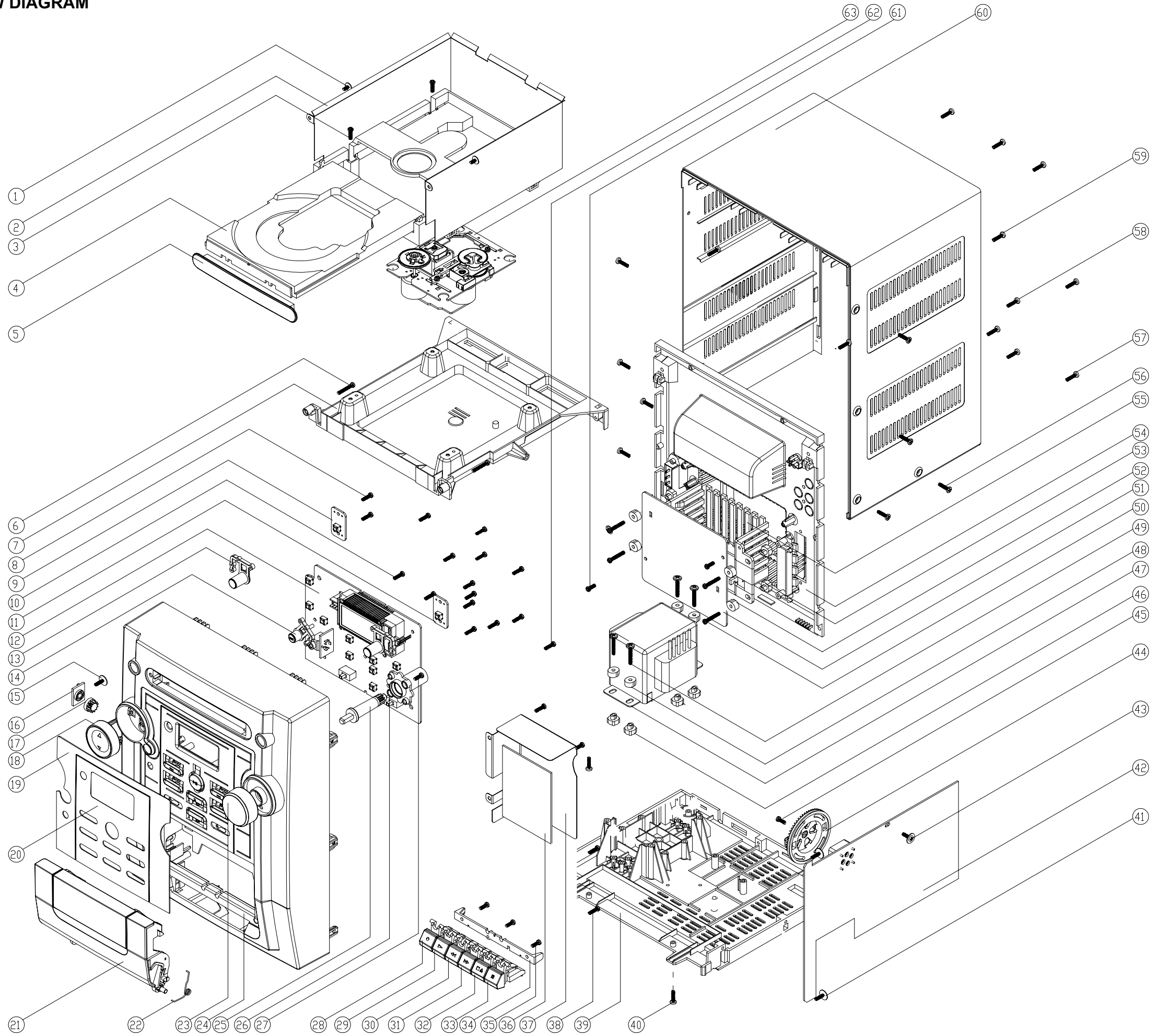
LAYOUT DIAGRAM - MAIN BOARD (TOP VIEW)



LAYOUT DIAGRAM - MAIN BOARD (TOP VIEW)



EXPLODED VIEW DIAGRAM



ACCESSORIES

MAS339	FWM139		
9965 000 38845	9965 000 38781	REMOTE HANDSET	
9965 000 38846	9965 000 38808	WOODEN SPEAKER BOX	
	9965 000 38873	AC CORD SET (BS 6500 APP)	(FWM139/05)
	9940 000 05125	AC CORD SET (VDE APP)	(FWM139/12/55)
9965 000 38579		AC CORD SET (ARG PLUG)	(MAS339/77)
9965 000 38861		AC CORD SET	(MAS339/78)

MECHANICAL PARTS LIST

4	9965 000 38820	9965 000 38820	CD LOADER WXD-8210
5	9965 000 38847	9965 000 38814	CD DOOR
7	9940 000 04718	9940 000 04718	CD BRACKET
13	9940 000 04713	9940 000 04713	POWER KNOB
14	9965 000 38850	9965 000 38813	BBS KNOB
16	9940 000 04727	9940 000 04727	7831 GEAR STAND (MODE:0.8)
17	9940 000 04726	9940 000 04726	7831 GEAR (MODE:0.8)
18	9940 000 04708	9940 000 04708	VOLUME KNOB
19	9940 000 04728	9940 000 04728	FRONT LENS (1)
20	9965 000 38851	9965 000 38817	MAS339 FRONT LENS (2)
21	9965 000 38848	9965 000 38816	CASS DOOR
22	9940 000 05326	9940 000 05326	CASSETTE DOOR SPRING
23	9965 000 38849	9965 000 38812	TUNING KNOB
24	9940 000 04694	9940 000 04694	FRONT CAB
25	9940 000 04724	9940 000 04724	TUNING KNOB GEAR
28	9940 000 04705	9940 000 04705	REC KNOB
29	9940 000 04704	9940 000 04704	PLAY KNOB
30	9940 000 04707	9940 000 04707	REW KNOB
31	9940 000 04706	9940 000 04706	F.FWD KNOB
32	9940 000 04703	9940 000 04703	STOP KNOB
33	9940 000 04712	9940 000 04712	PAUSE KNOB
34	9940 000 04702	9940 000 04702	CASS DOOR BRACKET
34	9940 000 04719	9940 000 04719	CASS HOLDER
39	9965 000 38815	9965 000 38815	BOTTOM CAB
44	9940 000 04725	9940 000 04725	TUNING GEAR
54	9940 000 04697	9940 000 04697	BACK CAB
60	9940 000 04695	9940 000 04695	TOP CAB
63	9965 000 38819	9965 000 38819	CD MECH. SANYO DA11VF

others

9940 000 04711	9940 000 04711	FUNCTION SLIDE KNOB
9940 000 04714	9940 000 04714	CD SILDE KNOB
9940 000 04717	9940 000 04717	LCD BRACKET
9940 000 04721	9940 000 04721	RUBBER FOOT (18X8.5X3.0MM)
9965 000 38818	9965 000 38818	RECORD SPRING
9940 000 04734	9940 000 04734	CASS DECK CS-21SC-820T

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

ELECTRICAL PARTS LIST**MISCELLANEOUS**

JK701	9940 000 03989	ST PHONES JACK 3,5MM 7P
	9940 000 04779	SPEAKER TERMINAL 4P MSP-124V
	9940 000 03993	16 PIN FFC CABLE 210mm P=1.0
T901	⚠ 9965 000 38824	TRANSFORMER,123V/230V,EI-66
	⚠ 9940 000 04736	VOLTAGE SWITCH

MAIN PCB ASSY

CF101	9965 000 38852	FILTER FM450AL (DOUBLE)
CF102	9965 000 38853	FILTER LT10.7MS3
CF103	9965 000 38854	DISCRIMINATOR JT10.7MG-B
L101	9965 000 38855	AM OSC RED 10mm
L102	9965 000 38856	AM IFT YEL 10mm
L107	9940 000 04773	INDUCTOR (R-TYPE) 100UH
L108	9965 000 38857	AM COIL 112:10 D10
U101	9965 000 38844	FM BPF (BP87108B)
	9940 000 03966	FERRITE BAR D10XL60
PVC101	9940 000 04775	PVC (DF443DF04-A04)
ZD601	9940 000 04751	ZENER DIODE -5% 9V1
ZD902	9965 000 38830	ZENER DIODE -5% 12V
ZD903	9940 000 04749	ZENER DIODE -5% 6V8
ZD904	9965 000 38828	ZENER DIODE -5% 3V9
IC101	9940 000 03962	IC TA2111NG
IC601	9965 000 38832	IC LC75342-TLM-E
IC901	9965 000 38833	IC LM7805CZ
Q104	9965 000 38858	TR NPN 9018G
Q105	9965 000 38838	TR NPN 2SC5343YPF
Q903	9965 000 38859	TR NPN SRC1202MPF
Q904	9965 000 38838	TR NPN 2SC5343YPF
Q905	9965 000 38872	TR PNP SRA2202M
Q906	9965 000 38860	TR NPN KTD2058Y
Q907	9965 000 38837	TR NPN STD882
Q908	9965 000 38872	TR PNP SRA2202M
Q909	9965 000 38872	TR PNP SRA2202M
Q910	9965 000 38837	TR NPN STD882
Q911	9965 000 38838	TR NPN 2SC5343YPF
Q913	9965 000 38838	TR NPN 2SC5343YPF

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

ELECTRICAL PARTS LIST**POWER AMP BOARD ASSY**

D704	9965 000 38831	DIODE (SB10-05A3)
D705	9965 000 38831	DIODE (SB10-05A3)
D905	9965 000 38843	BRIDGE RECTIFIER KBU604 6A
F901	△ 9940 000 04781	FUSE 50T-032H 3.15A 250V (S.B.)
F902	△ 9940 000 04781	FUSE 50T-032H 3.15A 250V (S.B.)
F903	△ 9965 000 38821	FUSE 2A 250V (VDE)(FAST BLOW)
IC701	9965 000 38834	IC STK453-030A
Q701	9965 000 38839	TR NPN STC128
Q702	9965 000 38839	TR NPN STC128
Q703	9965 000 38841	TR NPN STD1862LPF

KEY BOARD ASSY

ZD102	9965 000 38827	ZENER DIODE -5% 3V
ZD301	9965 000 38828	ZENER DIODE -5% 3V9
ZD302	9965 000 38828	ZENER DIODE -5% 3V9
ZD303	9940 000 04748	ZENER DIODE -5% 4V7
LD301	9940 000 04788	LED BLUE D5 (DL5NBCH-W)
IC102	9965 000 38835	IC ET3600 SOP8
IC301	9965 000 38836	IC LC87F7CC8AU (MCU)
IC302	9940 000 04737	IC D6208 (MOTOR DRIVER) SOT8
Q303	9965 000 38838	TR NPN 2SC5343YPF
Q305	9965 000 38838	TR NPN 2SC5343YPF
Q306	9965 000 38837	TR NPN STD882
Q308	9965 000 38872	TR PNP SRA2202M
Q313	9965 000 38838	TR NPN 2SC5343YPF
REM301	9940 000 03956	SENSOR AT136B 36KHZ 5V
LCD301	9940 000 04789	LCD SDT-M3797-TP-4
SW300	9965 000 38829	SLIDE SW (SSH-23D15-G5-NS)
SW301	9965 000 38829	SLIDE SW (SSH-23D15-G5-NS)
SW303	9940 000 04792	TACT SW 6X6MM H4.3
SW304	9940 000 04792	TACT SW 6X6MM H4.3
SW305	9940 000 04792	TACT SW 6X6MM H4.3
SW306	9940 000 04792	TACT SW 6X6MM H4.3
SW307	9940 000 04792	TACT SW 6X6MM H4.3
SW308	9940 000 04792	TACT SW 6X6MM H4.3
SW315	9940 000 04792	TACT SW 6X6MM H4.3
SW316	9940 000 04792	TACT SW 6X6MM H4.3
SW317	9940 000 04792	TACT SW 6X6MM H4.3
SW318	9940 000 04792	TACT SW 6X6MM H4.3
X301	9965 000 38822	CRYSTAL JF32.768KHZ JU2X6
X302	9965 000 38823	CRYSTAL 8MHZ (HC-49US)

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

ELECTRICAL PARTS LIST**MP3/CD BOARD ASSY**

IC801	9965 000 38871	IC LC78690NW-E
IC802	9965 000 38842	IC LA6548NH (4 CH DRIVER)
Q801	9940 000 03973	CHIP TR MMBT9015C
Q802	9965 000 38840	TR PNP 2SB764-D
X801	9965 000 38825	CRYSTAL 16.9344MHZ (HC-49S)
SW314	9940 000 04792	TACT SW 6X6MM H4.3

TAPE DECK PCB ASSY

ZD201	9965 000 38826	ZENER DIODE -5% 7V5
IC201	9940 000 04007	IC D7312
Q201	9965 000 38841	TR NPN STD1862LPF
SW201	9940 000 04784	REC/PLAY SW (PS-62D01-NS)
T201	9940 000 04008	OSC COIL

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