

Service
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Service Manual



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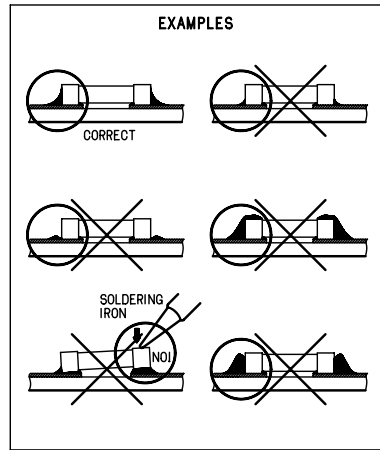
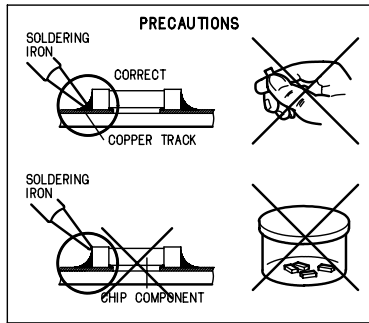
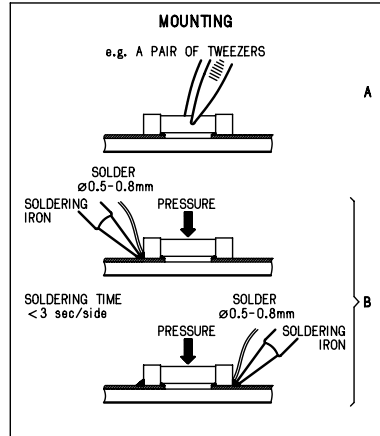
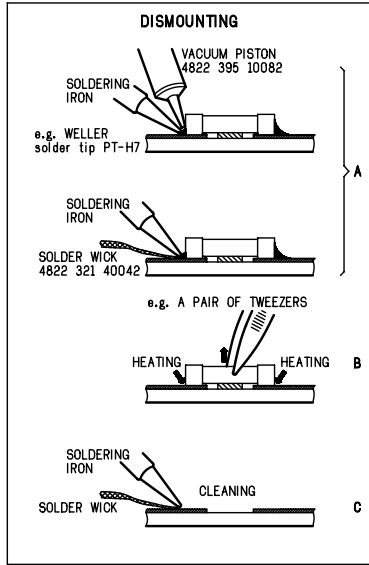
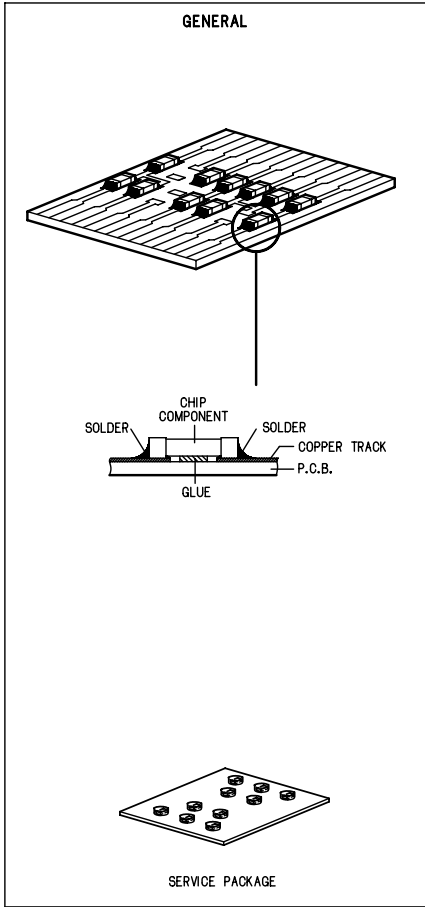
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Published by LX 0338Service Audio Printed in The Netherlands Subject to modification

GB 3140 785 32670



HANDLING CHIP COMPONENTS



(GB) WARNING

All ICs and many other semiconductors 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 wristband with resistance. Keep components and tools 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 enfilier le bracelet sert 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). Unvorsichtige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren. Sorgen Sie dafür, daß Sie im Reparaturfall über ein Pulsarmband mit Widerstand mit dem Massepotential des Gerätes verbunden sind. Halten Sie Bauteile und Hilfsmittel ebenfalls auf diesem Potential.

(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 braccialeto 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. Safety components are marked by the symbol

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées. Les composants de sécurité sont marqués

SAFETY



(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Gerätes darf nicht verändert werden. Für Reparaturen sind Originalersatzteile zu verwenden. Sicherheitsbauteile sind durch das Symbol markiert.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast. De Veiligheidsonderdelen zijn aangeduid met het symbool

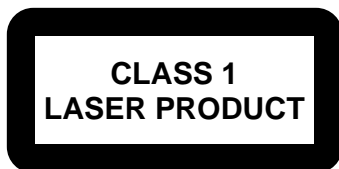
(I)

Le norme di sicurezza estigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati. Componenti di sicurezza sono marcati con

(GB) DANGER: 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.

(DK) Advarsel ! Usynlig laserstrålning ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.



(GB) After servicing and before returning the set to customer perform a leakage current measurement test from all exposed metal parts to earth ground, to assure no shock hazard exists. The leakage current must not exceed 0.5mA.

(FIN) Varoitus ! Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkymättömälle laserisäteilylle. Älä katso säteeseen !

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

TECHNICAL SPECIFICATIONS

GENERAL

Mains voltage	-/00C : 230 V
	-/17 : 120 V
Mains frequency	-/00C : 50 Hz
	-/17 : 60 Hz
Battery	mains : 9 V (R14 x 6)
Power consumption	: 12W
Dimensions(L x D x H)	: 408 x 278 x 153

AMPLIFIER

Output power	mains : 2 x 1.6 W
	battery : 2 x 1.6 W
Speaker impedance	: 2 x 6 ohm

TUNER - FM SECTION

Tuning range	: 87.5 - 108 MHz
IF frequency	: 10.7 MHz
Sensitivity	: < 22 dBf at 26dB S/N
Selectivity	: > 20 dB at ± 300 kHz
IF rejection	: > 50 dB
Image rejection	: > 20 dB

TUNER - AM SECTION

Tuning range	: 531 - 1602 kHz
	for /17 only : 530 - 1700 kHz
IF frequency	: 450 kHz \pm 1 kHz
Sensitivity	: < 4000 μ V/m at 26dB S/N
Selectivity	: > 500mV/m at S9/300kHz
IF rejection	: > 24 dB
Image rejection	: > 28 dB

COMPACT DISC

Frequency response	100 Hz : +9dB \pm 2dB Vol.max.-20dB
S/N ratio	: > 57 dBA
Channel difference	1 kHz : < 3 dB
Channel crosstalk	1 kHz : > 26 dB
Channel crosstalk	10 kHz : > 16 dB
Shock resistance	\pm Z axis : 5G
	\pm X or Y axis : 5G

SERVICE TOOLS

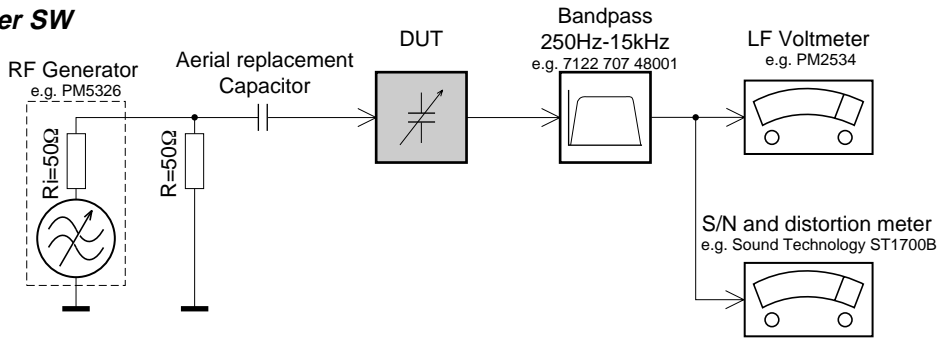
Audio signal disc SBC 429.....	4822 397 30184
Playability test disc SBC 444.....	4822 397 30245
Test disc 5 (disc without errors) +	
Test disc 5A (disc with dropout errors, black spots and fingerprints)	
SBC 426/426A.....	4822 397 30096
Burn in test disc (65 min. 1kHz signal at -30 dB level without "pause").....	4822 397 30155

AVAILABLE ESD PROTECTION EQUIPMENT

anti-static table mat large 1200x650x1.25mm	4822 466 10953
small 600x650x1.25m	4822 466 10958
anti-static wristband	4822 395 10223
connection box (3 press stud connections, 1M Ω)	4822 320 11307
extendible cable (2m, 2M Ω , to connect wristband to connection box)	4822 320 11305
connecting cable (3m, 2M Ω , to connect table mat to connection box)	4822 320 11306
earth cable (1M Ω , 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

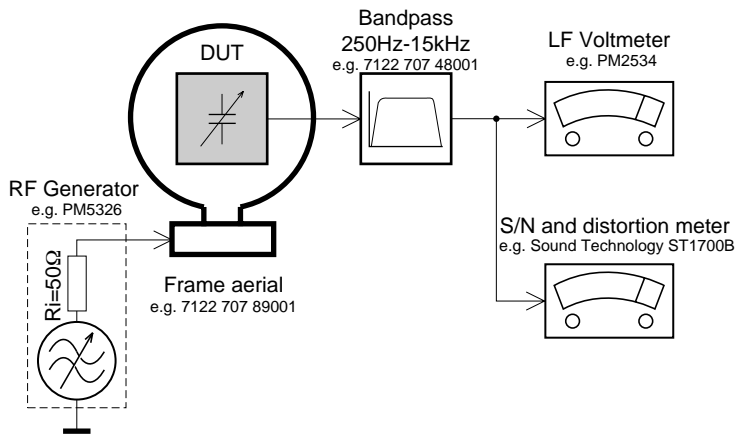
SERVICE MEASUREMENT

Tuner SW



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).

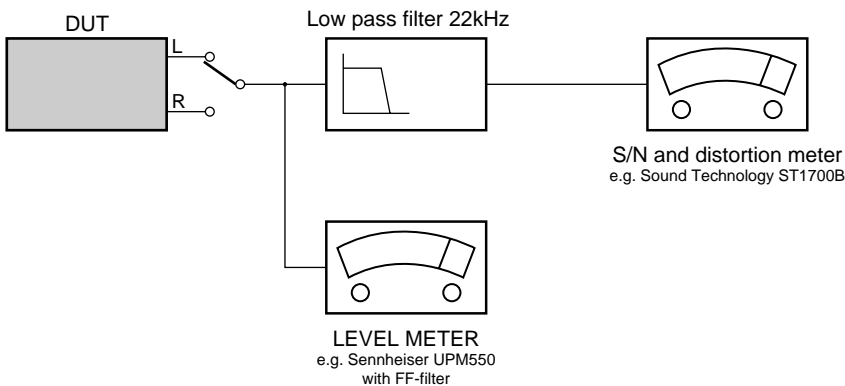
Tuner AM (MW,LW)



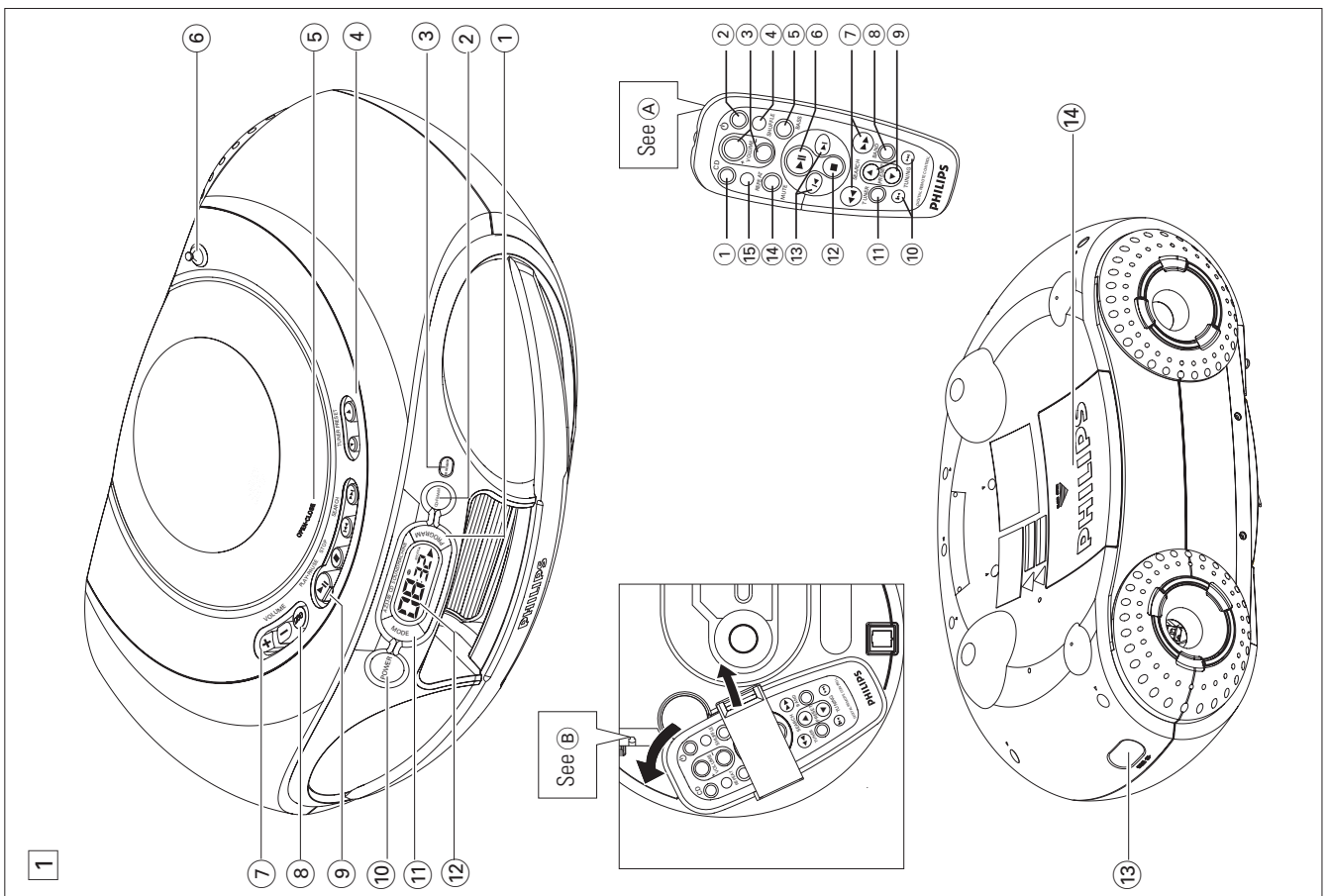
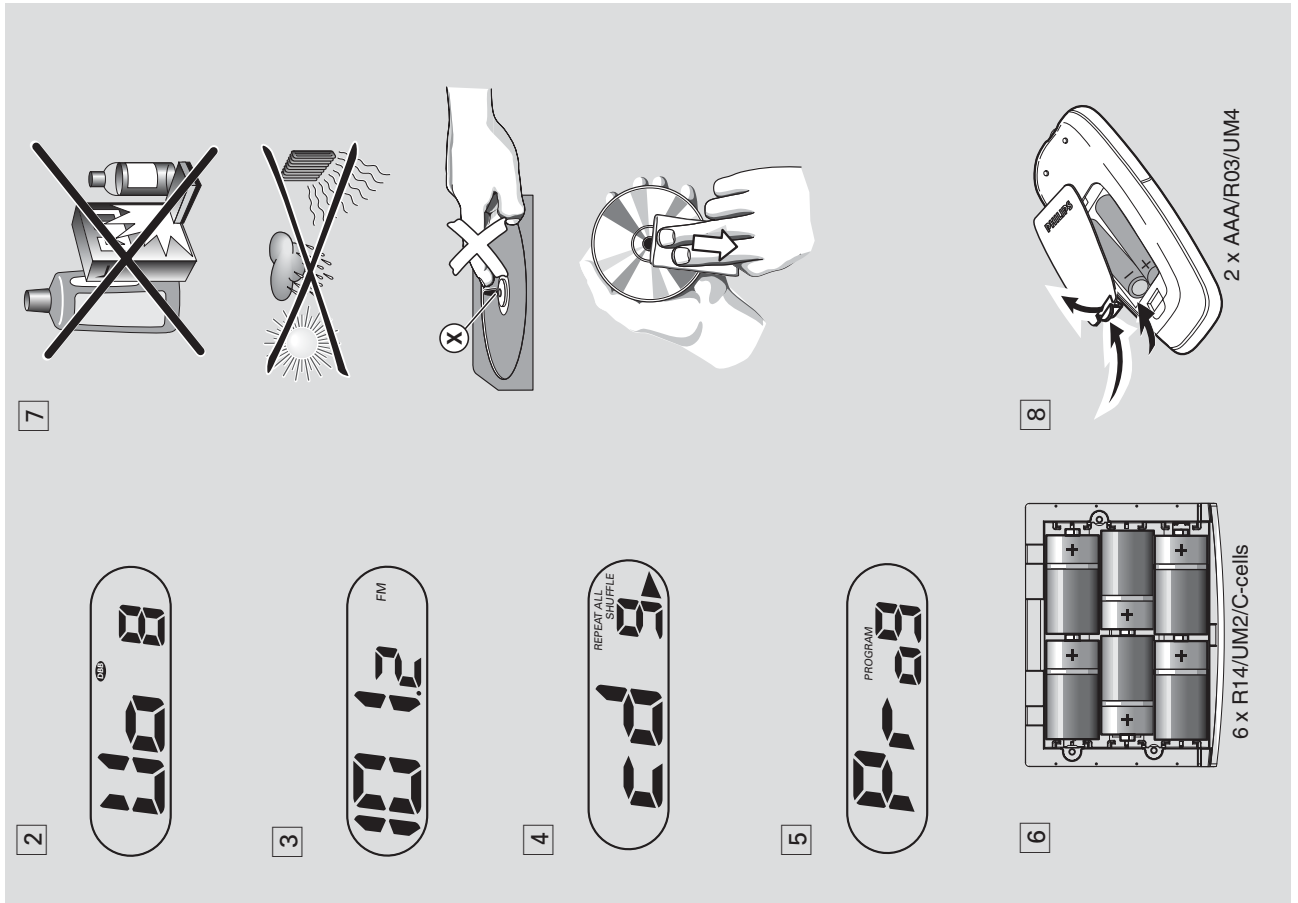
To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday«s cage.

CD

Use Audio Signal Disc SBC429 4822 397 30184 (replaces test disc 3)
L.P.F. = 13th order filter 4822 395 30204



CONNECTIONS AND CONTROLS



ACCESSORIES

- 1 x AC mains lead
- 1 x Remote Control

TOP AND FRONT PANEL (See [1])

- ① **PROGRAM**
CD: - programs tracks and reviews the program;
Tuner: - programs preset radio stations.
- ② **CD•FM•MW•LW** - selects **CD / FM / MW / LW** function
- ③ **IR SENSOR** - infrared for remote control
- ④ **TUNER PRESET** **▼ ▲** - selects a preset radio station.
- ⑤ **OPEN•CLOSE** - opens / closes CD door.
- ⑥ **Telescopic antenna** - improves FM reception.
- ⑦ **VOLUME +, -** - to adjust volume level.
- ⑧ **DBB** (Dynamic Bass Boost) - activates a more vivid bass response.
- ⑨ **▶II** - starts or pauses CD playback.
■ - to stop playback or erase a CD program.

SEARCH **◀◀, ▶▶**

CD: - searches backward and forward within a track;
- skips to the beginning of a current track/
previous/ later track.

Tuner: - (down, up) tunes to radio stations.

- ⑩ **POWER** - power on / off switch
- ⑪ **MODE** - selects different play modes: e.g. **REPEAT** or **SHUFFLE** (random) order.
- ⑫ **Display** - shows the status of the set.

BACK PANEL (See [1])

- ⑬ **AC MAINS** - inlet for mains lead.
- ⑭ **Battery compartment** - for 6 batteries, type **R-14, UM2 or C-cells**.

CONTROL**REMOTE CONTROL (See [A])**

- ① **CD** - selects CD sound source
- ② **⏻** - switches the set to standby / on if set operating on AC power. (Switches set off only if battery powered)
- ③ **VOLUME +, -** - adjusts volume level (*up, down*)
- ④ **SHUFFLE** - plays all CD tracks in random order
- ⑤ **BASS** - selects DBB on/off
- ⑥ **▶II** - starts/ pauses CD playback
- ⑦ **SEARCH** **◀◀, ▶▶** - searches backwards/ forwards within a track
- ⑧ **BAND** - selects FM/MW/LW waveband
- ⑨ **PRESET** **▲, ▼** - selects a preset radio station (*up, down*)
- ⑩ **TUNING** **◀◀, ▶▶** - tunes to tuner stations (*down, up*)
- ⑪ **TUNER** - selects tuner sound source
- ⑫ **■** - stops CD playback;
- erases a CD programme
- ⑬ **◀, ▶** - skips to the beginning of a current track previous/ subsequent track
- ⑭ **MUTE** - interrupts/ resumes sound
- ⑮ **REPEAT** - repeats a track / programme/ entire CD

CAUTION

Use of controls or adjustments or performance of procedures other than herein may result in hazardous radiation exposure or other unsafe operation.

POWER SUPPLY

Whenever convenient, use the AC power supply to conserve battery life. Make sure you remove the power plug from the set and wall socket before inserting batteries.

Batteries (not included)

- Insert 6 batteries, type **R-14, UM-2 or C-cells**, (preferably alkaline) with the correct polarity. (See [6])
- **Remote control**
Insert 2 batteries, type **AAA, R03 or UM4** (preferably alkaline). (See [8])

POWER SUPPLY**IMPORTANT !**

- Incorrect use of batteries can cause electrolyte leakage and will corrode the compartment or cause the batteries to burst.
- Do not mix battery types: e.g. alkaline with carbon zinc. Only use batteries of the same type for the set.
- When inserting new batteries, do not try to mix old batteries with the new ones.
- **Batteries contain chemical substances, so they should be disposed of properly.**

Using AC Power

- 1. Check if the AC power supply, as shown on the **type plate located on the bottom of the set**, corresponds to your local power supply. If it does not, consult your dealer or service centre.
- 2. Connect the mains lead to the wall socket.
- 3. To disconnect the mains supply, unplug the set from the wall socket.

Storing your remote control

This set has a special built-in storage compartment for your remote control. The storage compartment has a latch to keep your remote control in place, and is located inside the CD compartment. (See [B])

Placing your set

To avoid possible staining of surfaces, please do not stand this set in vertical position over a long period.



The type plate is located on the bottom of the set.

This set complies with the radio interference requirements of the European Community.

For users in the U.K., please follow the boxed instructions 'Important notes...' on this sheet.

BASIC FUNCTIONS**Switching on and off and selecting function**

- 1. Press **POWER** on the set (or **⏻** on remote control) to switch on.
- 2. Press **CD•FM•MW•LW** once or more to select: CD / Tuner function, and operate the respective function controls.
- 3. Press **POWER** to switch off the set.

Note : The **DBB** setting, tuner presets and the volume level (maximum to 20) will be retained in the set's memory.

Adjusting volume and sound (See [2])

- 1. Adjust the volume with the **VOLUME +, -** controls.
→ Display shows the volume level in number from 0-32.
- 2. Press **DBB** once or more to select dynamic bass boost on or off.
→ Display: shows **DBB** when activated.

DIGITAL TUNER

DIGITAL TUNER

CD PLAYER

CD PLAYER

DIGITAL TUNER

Tuning to radio stations

- Press **POWER** to on, then press **CD•FM•MW•LW** (or **TUNER** on remote control) to select **TUNER**. → **TU** is displayed briefly and then the radio station frequency, waveband and, if programmed, a preset number are shown (See [3]).
- Press **CD•FM•MW•LW** (or **BAND** on remote control) once or more to select your waveband.
- Press and hold **SEARCH** ◀◀ or ▶▶ until the frequency in the display starts running. → The radio automatically tunes to a station of sufficient reception. Display shows *5 r z h* during automatic tuning.
- Repeat step 2 if necessary until you find the desired station.

- To tune to a weak station, press ◀◀ or ▶▶ briefly and repeatedly until you have found optimal reception.

To improve radio reception:

- For **FM**, extend, incline and turn the telescopic antenna. Reduce its length if the signal is too strong.
- For **MW or LW**, the set uses a built-in aerial. Direct this aerial by turning the whole set.

Programming radio stations

You can store up to a total of 30 radio stations (20 FM, 5 MW and 5 LW) in the memory, manually or automatically (Autostore).

Manual programming

- Tune to your desired station (see **Tuning to radio stations**).
- Press **PROGRAM** to activate programming. → **PROGRAM** flashes.
- Press **TUNER PRESET** ▼ ▲ once or more to select a preset number.
 - Remote control** : Press **PRESET** ▲, ▼ once or more to select a preset station.
- Press **PROGRAM** to confirm.
- Repeat steps 1-4 to store other stations.

Note : You can erase a preset station by storing another frequency in its place.

Autostore

Autostore automatically starts programming radio stations from preset 1. Available stations are programmed in order if the station with sufficient reception strength. Any previous presets e.g. manually programmed will be erased.

- Press **PROGRAM** for 2 seconds or more to activate autostore programming. → The display shows *RLZ Q*, **PROGRAM** blinks, followed by the radio station details when stored.

After all stations are stored, the first preset station will then automatically play.

To listen to a preset station

- Press the **TUNER PRESET** ▼ ▲ buttons once or more until the desired preset station is displayed.
- Remote control : optionally, press **PRESET** ▲, ▼ to select your preset station.

Playing a CD

This CD player plays Audio Discs including CD-Recordables and CD-Rewritables.

- Adjust the **CD•FM•MW•LW** to **CD** (or **CD** on remote control)
- Open the CD Door. → *CD E R* is displayed.
- Insert a CD with the printed side facing up and close the door. → *r z z z* if no CD inserted/ CD dirty, incorrectly inserted or damaged. → *r F z z* if you have inserted a non-finalized CD-R(W).

- Press ▶▶ to start playback.

→ *r R z R* if your CD contains non-audio i.e. data files.

- To pause playback press ▶▶. Press ▶▶ again to resume play.

→ Display: ▶ flashes during pause.

- To stop CD playback, press the ■ button.

Note : CD play will also stop when:

- the CD door is opened
- the CD has reached the end
- you select **FM / MW / LW** function.

Selecting a different track

- Press **SEARCH** ◀◀ or ▶▶ once or repeatedly to select your track.
- In the pause / stop position, press ▶▶ to start playback.

Finding a passage within a track

- Press and hold **SEARCH** ◀◀ or ▶▶. → The CD is played at high speed and low volume.
- When you recognize the passage you want, release ◀◀ or ▶▶ to resume normal playback.

Different play modes: SHUFFLE and REPEAT

You can select and change the various play modes before or during playback, and combine the modes with **PROGRAM**. (See [4])

SHUFFLE - tracks of the entire CD/ program are played in random order

SHUFFLE REPEAT ALL - to repeat the entire CD/ program continuously in random order

REPEAT ALL - repeats the entire CD/ program

REPEAT - plays the current track continuously

- To select play mode, press **MODE** once or more.
- Press ▶▶ to start playback if in the stop position.
- To select normal playback, press **MODE**

repeatedly until the various modes are no longer displayed.

→ You can also press the ■ button to cancel your play mode.

CD PLAYER

Programming track numbers

In the stop position, select and store your CD tracks in the desired sequence. Up to 20 tracks can be stored in the memory.

1. Press **SEARCH** \lll or \lll on the set to select your desired track number.
2. Press **PROGRAM**.
→ Display: **PROGRAM**, $\text{P} \text{ } \text{r} \text{ } \text{r} \text{ } \text{r}$ briefly and your selected track number. (See [5])
→ If you attempt to program without first selecting a track number, $\text{r} \text{ } \text{r} \text{ } \text{E}$ is shown.
3. Repeat steps **1-2** to select and store all desired tracks.
→ Display: $\text{F} \text{ } \text{r} \text{ } \text{r} \text{ } \text{r}$ if you try to program more than 20 tracks.

Reviewing the program

In the stop position, press and hold **PROGRAM** until the display shows all your stored track numbers in sequence.

Erasing a program

You can erase the program by either:

- pressing \blacksquare twice
→ $\text{E} \text{ } \text{r} \text{ } \text{r}$ is displayed briefly and **PROGRAM** disappears.
- You select **FM** / **MW** / **LW** function.
- Open the CD door.

SAFETY & MAINTENANCE

SAFETY & MAINTENANCE INFORMATION

(See [7])

- Don't expose the set, batteries, CDs to humidity, rain, sand or excessive heat.
- Clean the set with a dry cloth. Don't use any cleaning agents containing alcohol, ammonia, benzene or abrasives as these may harm the set.
- Place the set on a hard and flat surface so that the system does not tilt. Make sure there is good ventilation to prevent the set overheating.
- The mechanical parts of the set contain self-lubricating bearings and must not be oiled or lubricated.

CD player and CD handling

- If the CD player cannot read CDs correctly, use a cleaning CD to clean the lens before taking the set to repair.
- The lens of the CD player should never be touched!
- Sudden changes in the surrounding temperature can cause condensation on the lens of your CD player. Playing a CD is then not possible. Do not attempt to clean the lens but leave the set in a warm environment until the moisture evaporates.
- Always close the CD door to avoid dust on the lens.
- To clean the CD, wipe in a straight line from the centre towards the edge using a soft, lint-free cloth. Do not use cleaning agents as they may damage the disc.
- Never write on a CD or attach any stickers to it.

TROUBLESHOOTING

If a fault occurs, first check the points listed below before taking the set for repair. If you are unable to remedy a problem by following these hints, consult your dealer or service centre.

WARNING: Do not open the set as there is a risk of electric shock! Under no circumstances should you try to repair the set yourself, as this will invalidate the guarantee.

RAMNo sound /power

- Volume not adjusted
- Adjust the **VOLUME**
- Mains lead not securely connected
- Connect the AC mains lead properly
- Batteries exhausted/ incorrectly inserted
- Insert (fresh) batteries correctly

Severe radio hum or noise

- Electrical interference: set too close to TV, VCR or computer
- Move the set to increase the distance

Poor radio reception

- Weak radio signal
- FM: Adjust the FM telescopic aerial

r r r r indication

- CD badly scratched or dirty
- Replace/ clean CD, see Maintenance
- Laser lens steamed up
- Wait until lens has cleared

r F r r r indication

- CD-R(W) is blank/ not finalized
- Use a finalized CD-R(W)

d r r r r indication

- CD contains non-audio files
- Press **SEARCH** \lll or \lll once or more to skip to a CD audio track, instead of the data file

The CD skips tracks

- CD damaged or dirty
- Replace or clean CD
- SHUFFLE or PROGRAM is active
- Switch off SHUFFLE / PROGRAM

Remote control does not function properly

- Batteries exhausted/ incorrectly inserted
- Insert (fresh) batteries correctly
- Distance/ angle between the set too large
- Reduce the distance/ angle

Environmental information

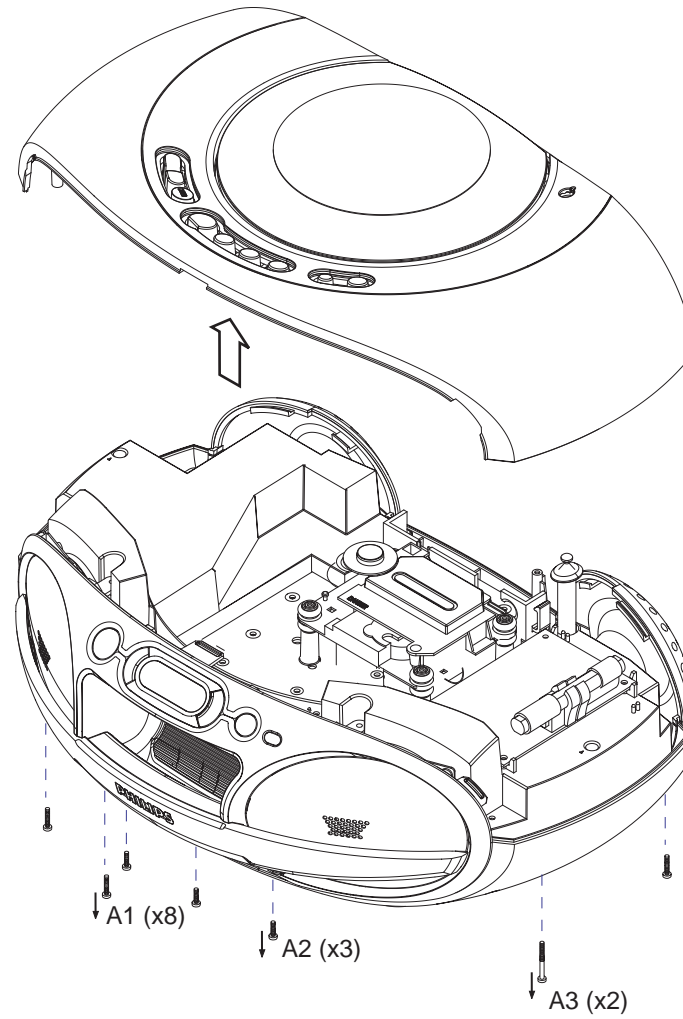
We have done our best to reduce the packaging and make it easy to separate into 3 materials: cardboard, expandable polystyrene, polyethylene.

Your set consists of materials which can be recycled if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packaging, exhausted batteries and old equipment.

DISASSEMBLY DIAGRAM

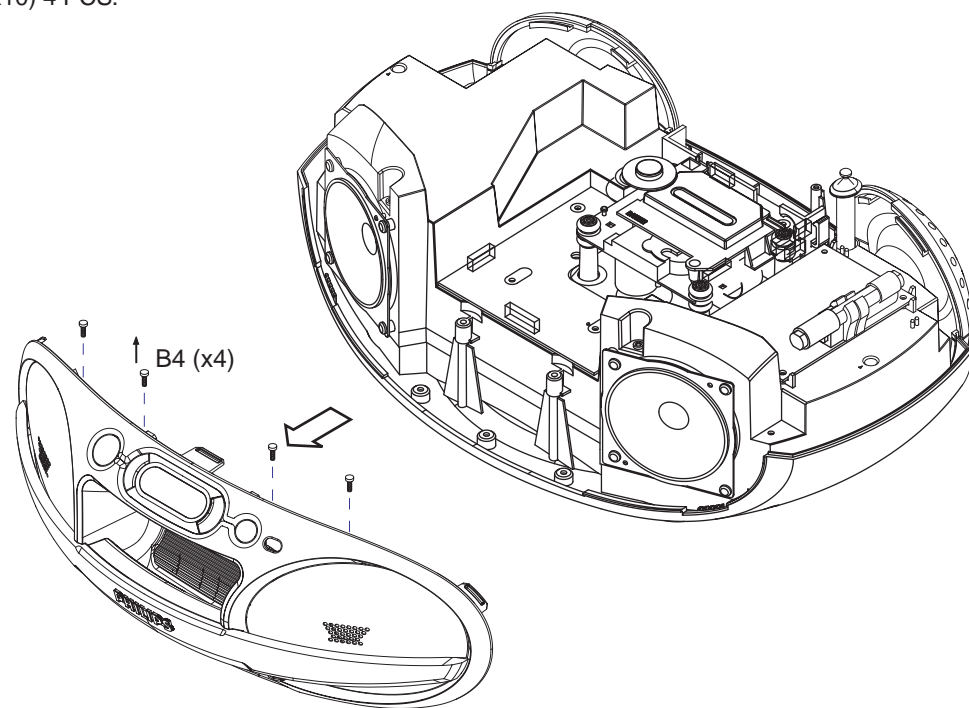
A. REMOVE TOP CABINET ASSEMBLY

- REMOVE SCREWS A1 (3X16) 8 PCS
- REMOVE SCREW A2 (3X10) 3 PCS
- REMOVE SCREW A3 (3X30) 2 PCS (IN THE BATTERY COMPARTMENT)



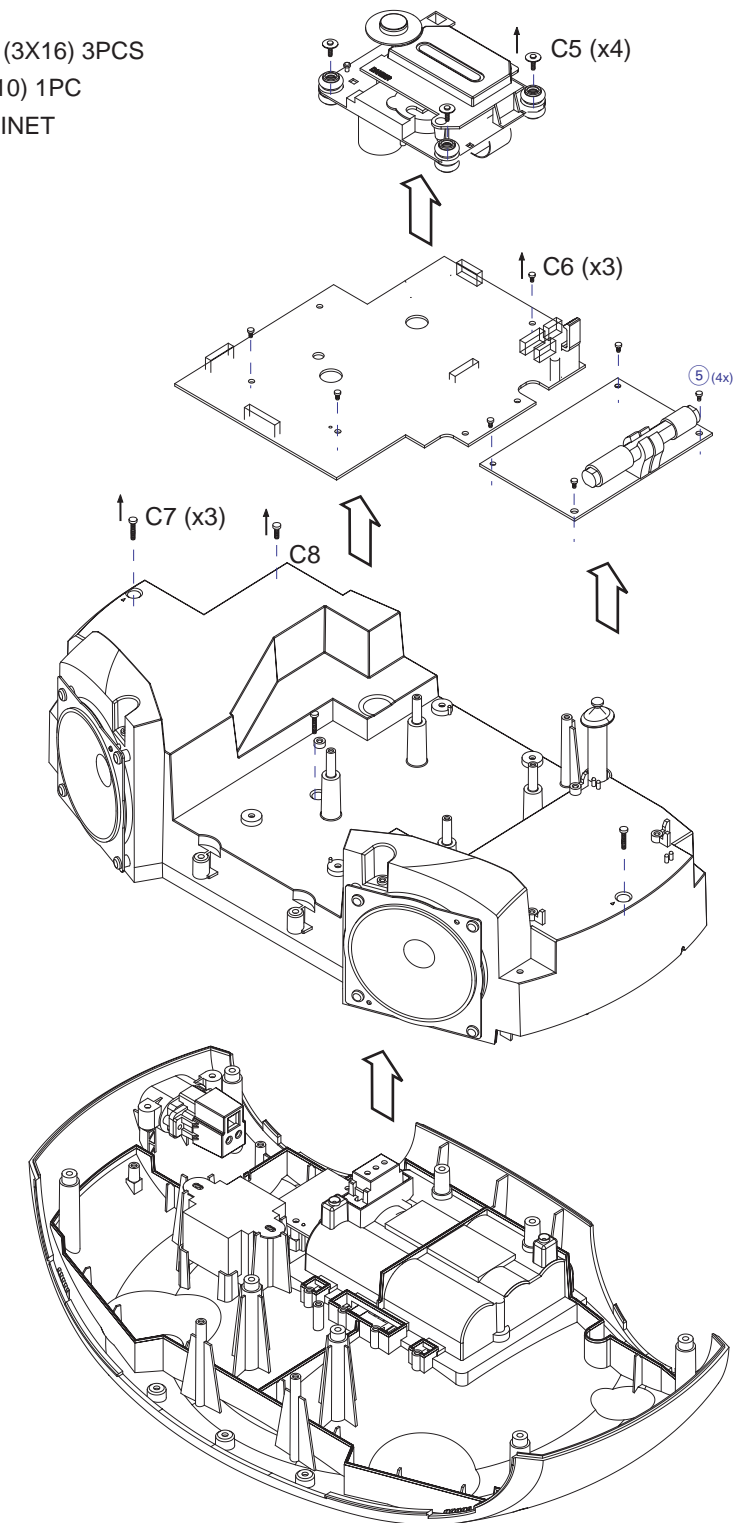
B. REMOVE FRONT CABINET ASSEMBLY

- REMOVE SCREWS B4 (3X10) 4 PCS.



C. REMOVE MIDDLE CABINET

- REMOVE SCREWS C5 (2.5X10) 4 PCS
- REMOVE CD MECHANISM
- REMOVE SCREWS C6 (3X10) 3 PCS
- REMOVE CD BOARD
- REMOVE SCREWS C7 (3X16) 3PCS AND SCREWS C8 (3X10) 1PC
- REMOVE MIDDLE CABINET



PIN DESCRIPTIN OF INTEGRATED CIRCUIT

SAA7824

CD audio decoder, digital servo & filterless DAC
with integrated pre-amp & laser control

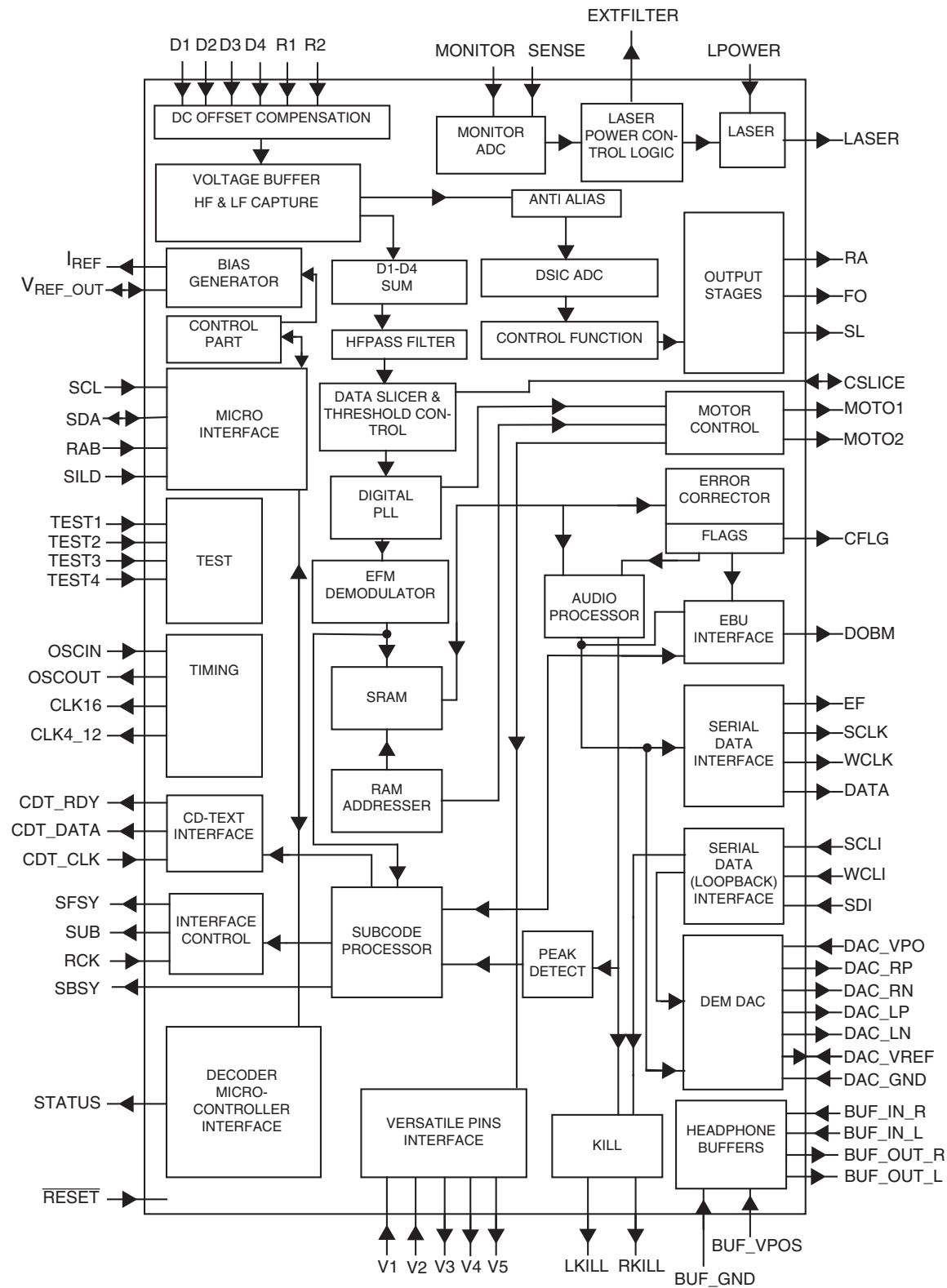
SYMBOL	PIN	DESCRIPTION
LPOWER	1	Laser power supply
EXTFILTER	2	10 nF capacitor for Laser start-up control
MONITOR	3	Laser monitor diode
SENSE	4	OPU ground reference point for MONITOR measurement
V _{SSA1}	5	Analogue ground 1
IREF	6	Reference current pin (24K Ω resister to analogue ground)
V _{DDA1}	7	Analogue supply voltage 1
VREF_OUT	8	Servo reference voltage
D1	9	Diode voltage/current input (central diode signal input)
D2	10	Diode voltage/current input (central diode signal input)
D3	11	Diode voltage/current input (central diode signal input)
D4	12	Diode voltage/current input (central diode signal input)
R1	13	Diode voltage/current input (satellite diode signal input)
R2	14	Diode voltage/current input (satellite diode signal input)
CSLICE	15	10nF capacitor for adaptive HF dataslicer
V _{DDA2}	16	Analogue supply voltage 2
V _{SSA2}	17	Analogue ground 2
OSCOUT	18	Crystal/resonator output
OSCIN	19	Crystal/resonator input
V _{SSA3}	20	Analogue ground 3
DAC_GND	21	Audio DAC ground
DAC_RP	22	Audio DAC right channel differential output (positive)
DAC_RN	23	Audio DAC right channel differential output (negative)
DAC_VREF	24	Audio DAC decoupling point (10uF//100nF to ground)
DAC_LN	25	Audio DAC left channel differential output (negative)
DAC_LP	26	Audio DAC left channel differential output (positive)
DAC_VPOS	27	Audio DAC positive supply
BUF_VPOS	28	Audio buffer positive supply
BUF_IN_R	29	Audio buffer right input
BUF_OUT_R	30	Audio buffer right output
BUF_OUT_L	31	Audio buffer left output
BUF_IN_L	32	Audio buffer left input
BUF_GND	33	Audio buffer ground
LKILL	34	Kill output for left channel (configurable as open drain)
RKILL	35	Kill output for right channel (configurable as open drain)
CDT_RDY	36	CD-Text to micro ready flag
CDT_DATA	37	CD-Text data to micro
CDT_CLK	38	CD-Text micro clock
CFLAG	39	Correction flag output (open drain)
V _{SSD1}	40	Digital ground 1
V _{DD1}	41	Digital supply voltage 1
SDI	42	Serial data input (loopback)
WCLI	43	Word clock input (loopback)

SYMBOL	PIN	DESCRIPTION
SCLI	44	Serial bit clock (loopback)
EF	45	C2 error flag
DATA	46	Serial data output
WCLK	47	Word clock output
SCLK	48	Serial clock output
CLK16	49	16MHz clock
CLK4_12	50	Configurable 4MHz or 12MHz clock
RESET	51	Power on reset (active low)
SDA	52	Micro interface data I/O line (open drain output)
SCL	53	Micro interface clock line
RAB	54	Micro interface R/W & load control line (4-wire)
SILD	55	Micro interface R/W & load control line (4-wire)
STATUS	56	Servo interrupt request line/decoder status register/DC offset value readback
RCK	57	Subcode clock
SUB	58	P to W subcode
SFSY	59	Subcode frame sync
SBSY	60	Subcode block sync
V _{SSD2}	61	Digital ground 2
DOBM	62	Bi-phase mark output (externally buffered)
V _{DD2}	63	Digital supply voltage 2
RA	64	Radial actuator
FO	65	Focus actuator
SL	66	Sledge actuator
MOTO1	67	Motor output 1
MOTO2	68	Motor output 2
V _{SSD3}	69	Digital ground 3
V _{DD3}	70	Digital supply voltage 3
V1	71	Versatile pin 1
V2	72	Versatile pin 2
V3	73	Versatile pin 3
V4	74	Versatile pin 4
V5	75	Versatile pin 5
TEST1	76	Test pin
TEST2	77	Test pin
TEST3	78	Test pin
TEST4	79	Test pin
LASER	80	Laser drive

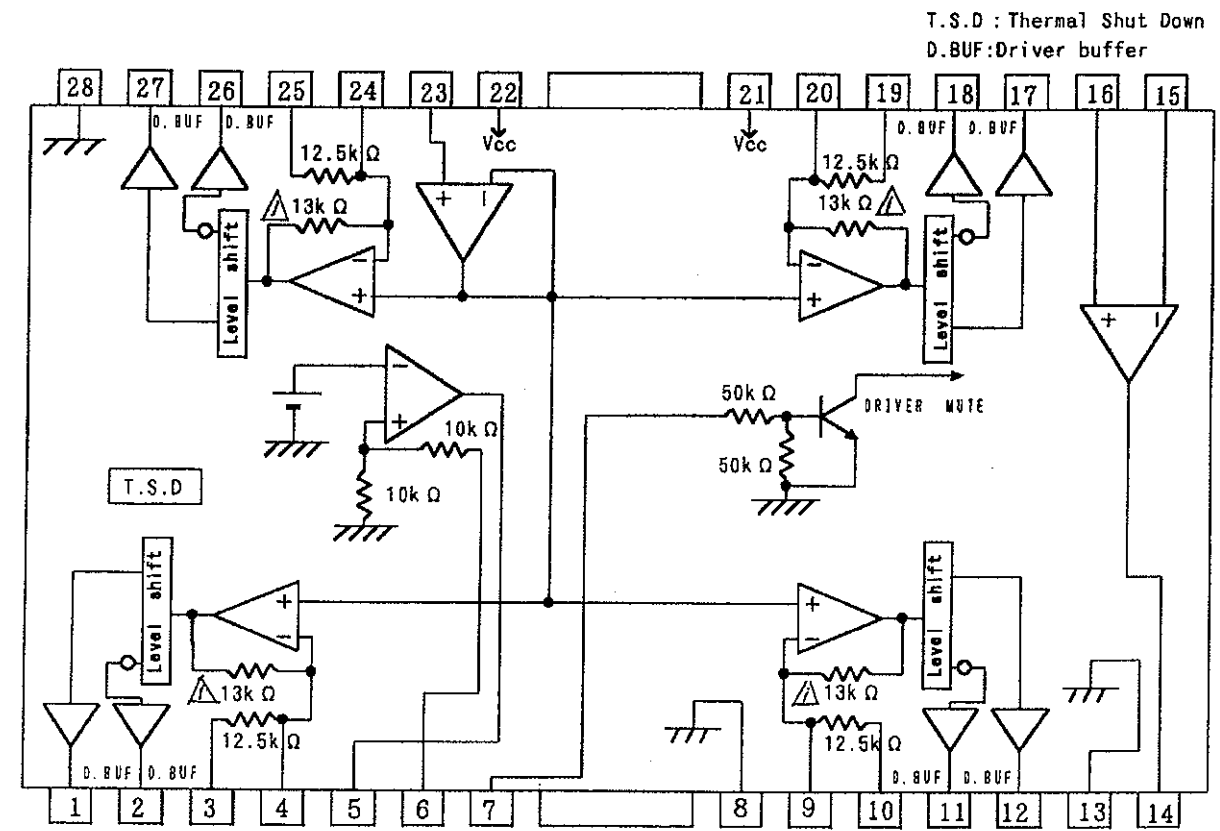
BLOCK DIAGRAM OF INTEGRATED CIRCUIT

SAA7824

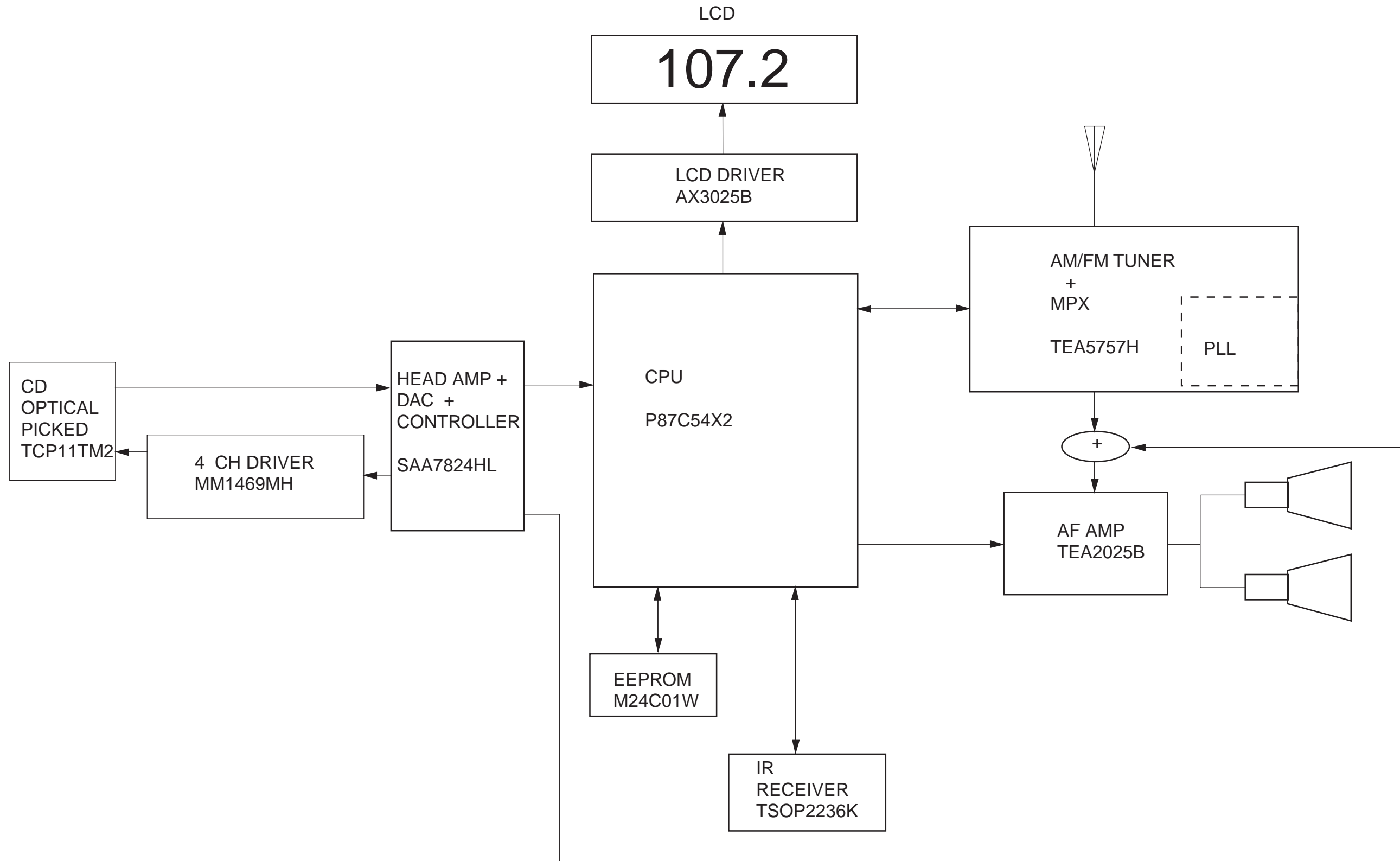
CD audio decoder, digital servo & filterless DAC with integrated pre-amp & laser control



MM1469AH

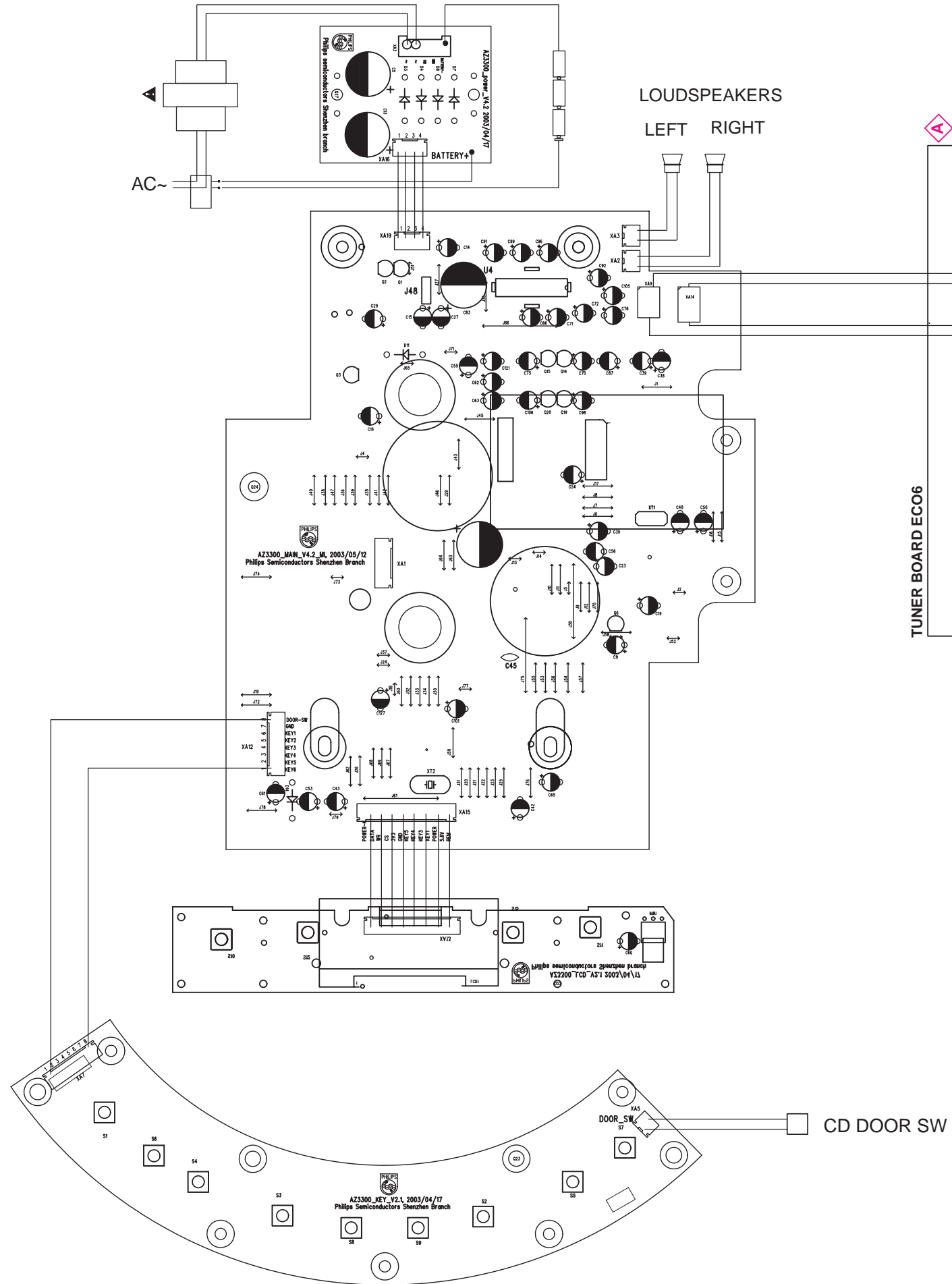


BLOCK DIAGRAM

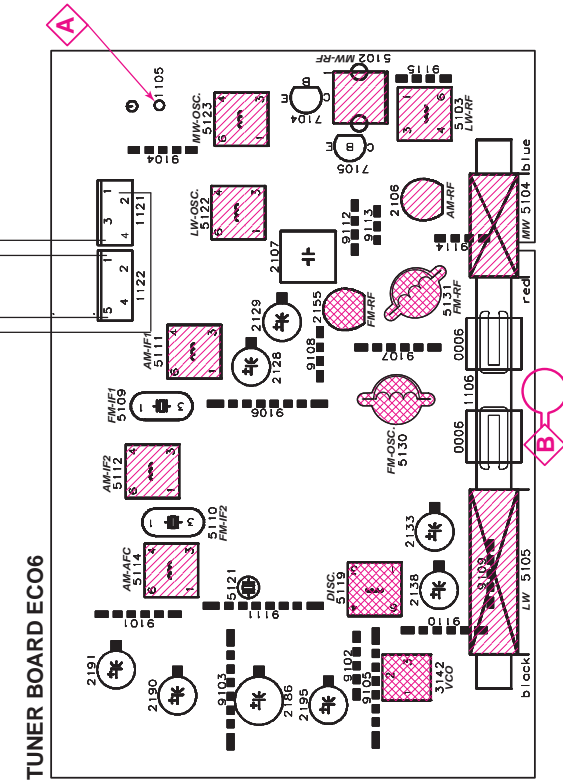


WIRING DIAGRAM

6 - 1

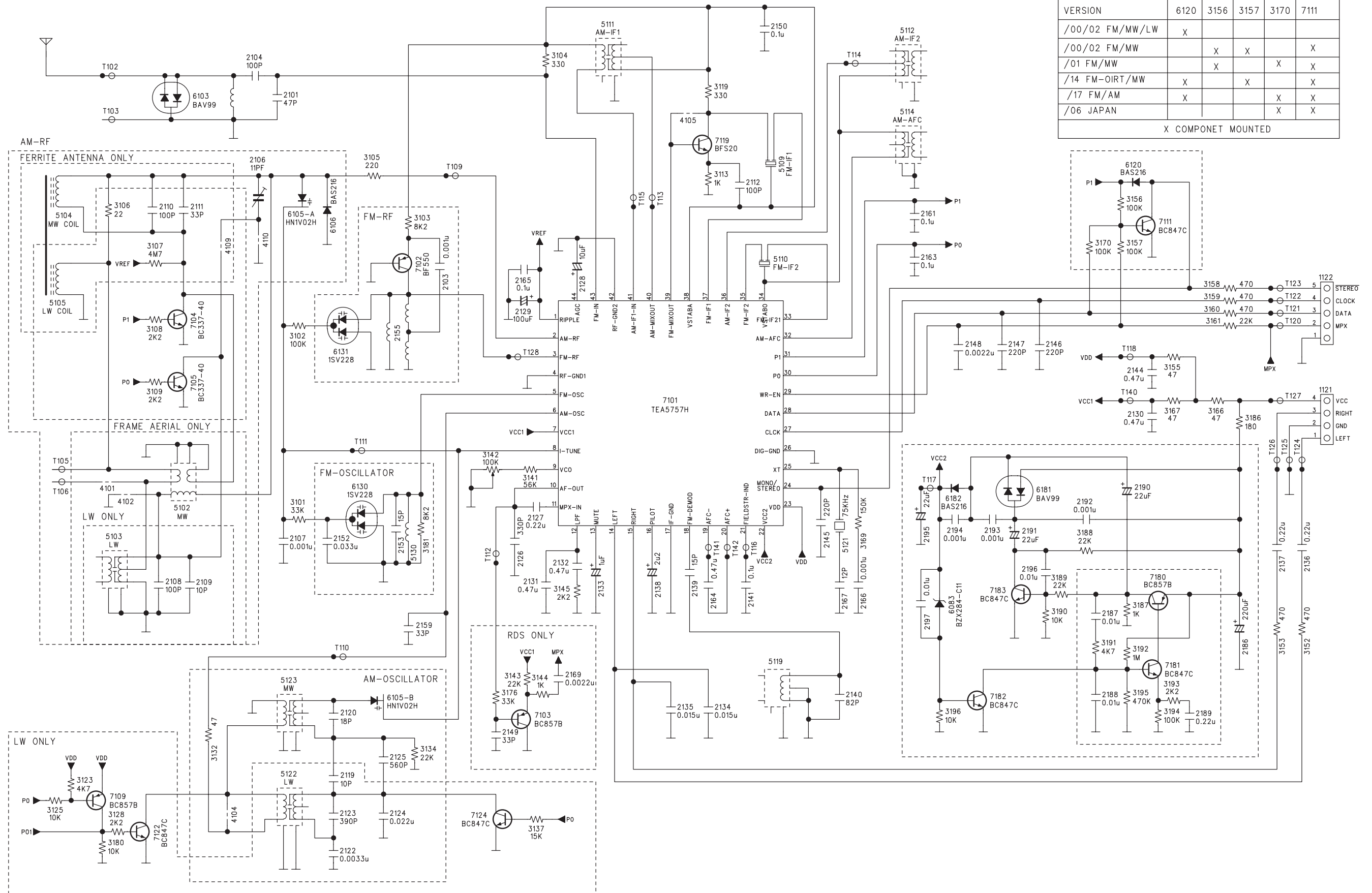


6 - 1



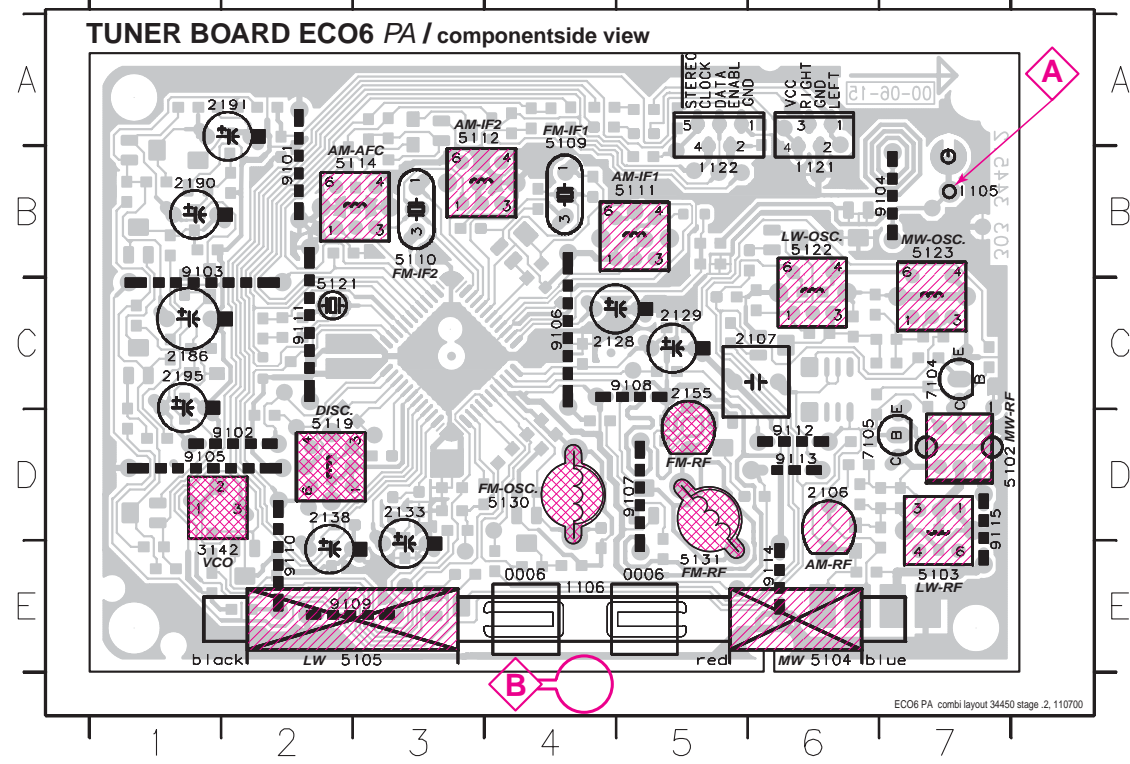
TUNER BOARD - CIRCUIT DIAGRAM

VERSION	6120	3156	3157	3170	7111
/00/02 FM/MW/LW	X				
/00/02 FM/MW		X	X		X
/01 FM/MW		X		X	X
/14 FM-OIRT/MW	X		X		X
/17 FM/AM	X			X	X
/06 JAPAN				X	X
X COMPONENT MOUNTED					

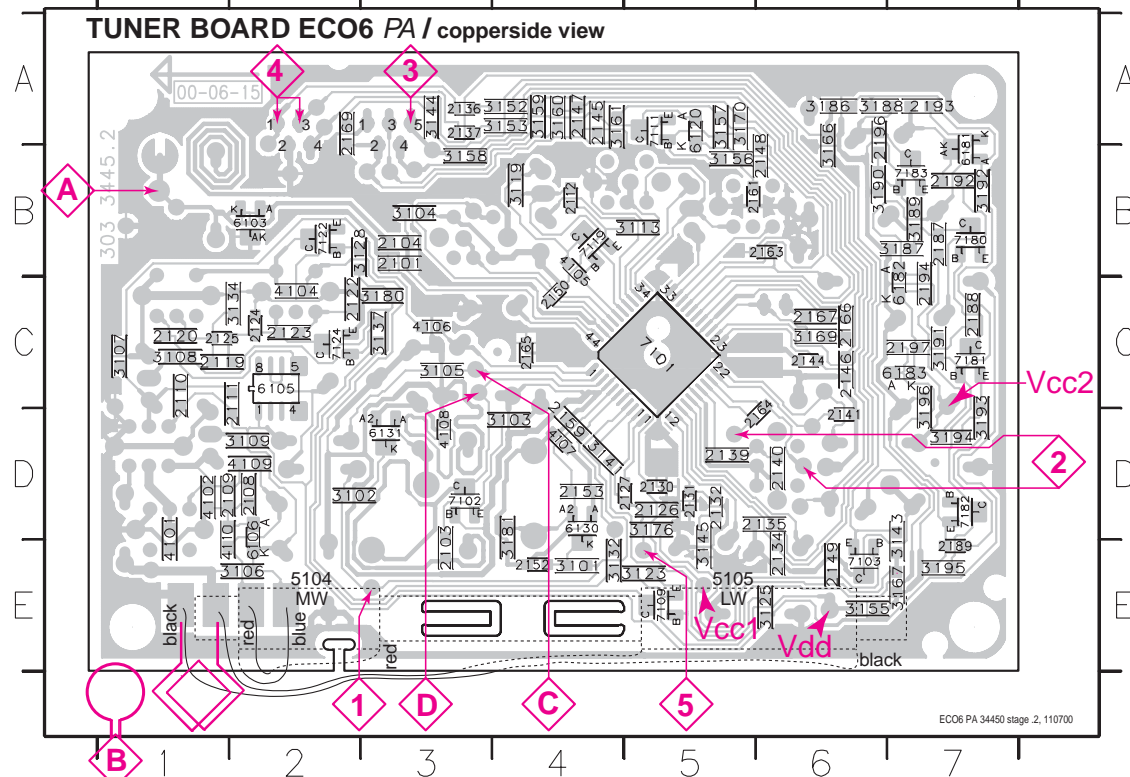


TUNER BOARD - LAYOUT DIAGRAM

1105 B7 2106 D6 2129 C5 2155 C5 2191 A2 5102 D7 5110 B3 5114 B3 5122 B6 5131 E5 9101 B2 9104 B7 9107 D5 9110 E2 9113 D6
 1121 B6 2107 C6 2133 D3 2186 C1 2195 C1 5103 E7 5111 B4 5119 D2 5123 B7 7104 C7 9102 D2 9105 D1 9108 C5 9111 C2 9114 E6
 1122 B5 2128 C4 2138 D2 2190 B1 3142 E1 5109 B4 5112 B3 5121 C2 5130 D4 7105 D6 9103 B1 9106 C4 9109 E2 9112 D6 9115 D7



2101 B3 2119 C1 2130 D5 2140 D6 2150 C4 2166 C6 2194 C7 3106 E2 3128 B2 3152 A4 3161 A4 3186 A6 3194 D7 4107 D4 6130 D4 7109 E5 7183 B7
 2103 E3 2120 C1 2131 D5 2141 D6 2152 E4 2167 C6 2196 A6 3107 C1 3132 E4 3153 A4 3166 B6 3187 B7 3195 E7 4108 D3 6131 D3 7111 A5
 2104 B3 2122 C2 2132 D5 2144 C6 2153 D4 2169 A2 2197 C7 3108 C1 3134 C2 3155 E6 3167 E7 3188 A6 3196 C7 4109 D2 6181 B7 7119 B5
 2108 D2 2123 C2 2134 E6 2145 A4 2159 D4 2187 B7 3101 E4 3109 D2 3137 C3 3156 B5 3169 C6 3189 B7 4101 D1 4110 D1 6182 C7 7122 B2
 2109 D1 2124 C2 2135 D6 2146 C6 2161 B5 2188 C7 3102 D2 3113 B5 3141 D4 3157 A5 3170 A5 3190 B6 4102 D1 6103 B2 6183 C7 7124 C2
 2110 C1 2125 C1 2136 A3 2147 A4 2163 B6 2189 E7 3103 D4 3119 B5 3143 D7 3158 B3 3176 D5 3191 C7 4104 C2 6105 C2 7101 C5 7180 B7
 2111 C2 2126 D5 2137 A3 2148 B6 2164 D6 2192 B7 3104 B3 3123 E5 3144 A3 3159 A4 3180 C3 3192 B7 4105 B4 6106 D2 7102 D3 7181 C7
 2112 B4 2127 D5 2139 D5 2149 E6 2165 C4 2193 A7 3105 C3 3125 E6 3145 E5 3160 A4 3181 D4 3193 D7 4106 C3 6120 A5 7103 E6 7182 D7



These assembly drawings show a summary of all possible versions.
 For components used in a specific version see schematic diagram respectively partslist.

TUNER ADJUSTMENT TABLE (ECO6 FM/MW- and FM/MW/LW - versions with ferrite antenna)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130		8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check	1	1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 45mV continuous wave	D		5119	2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz ¹⁾
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 2.2kΩ to Vcc	C Δf=±10kHz V _{RF} = 0.5mV (as low as possible) see remark 2)		5111	5	
				5112		
AM AFC MW		C continuous wave V _{RF} = 2mV		5114	2	0 ± 2 mV DC
AM RF³⁾						
LW	198kHz	B	198kHz	5105 LW ferrite coil		
MW FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B	1494kHz	2106	5	
	558kHz		558kHz	5104 MW ferrite coil		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz	B	1500kHz	2106	5	
	560kHz		560kHz	5104 MW ferrite coil		

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

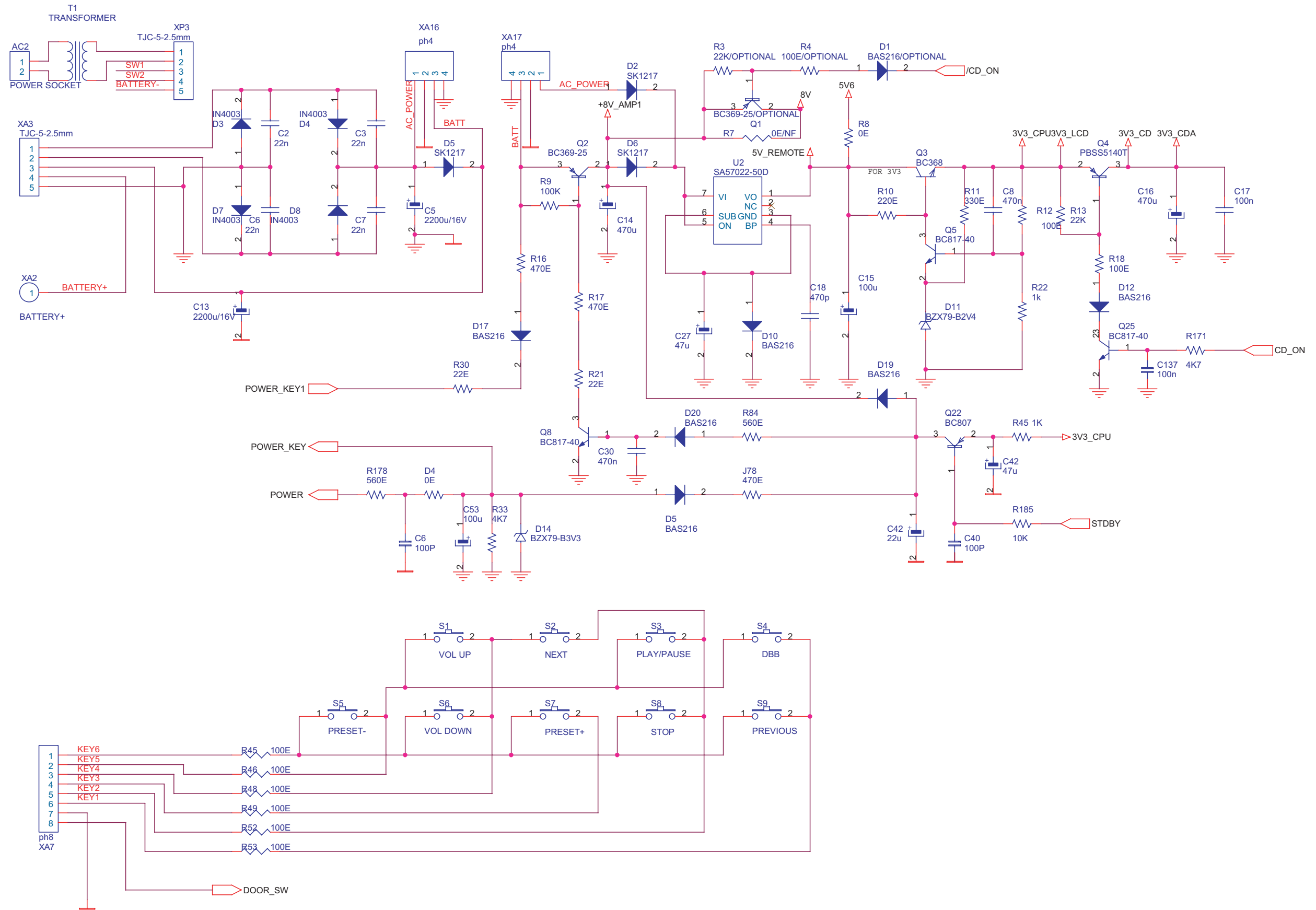
¹⁾ If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

²⁾ RC network serves for damping the IF-filter while adjusting the other one.

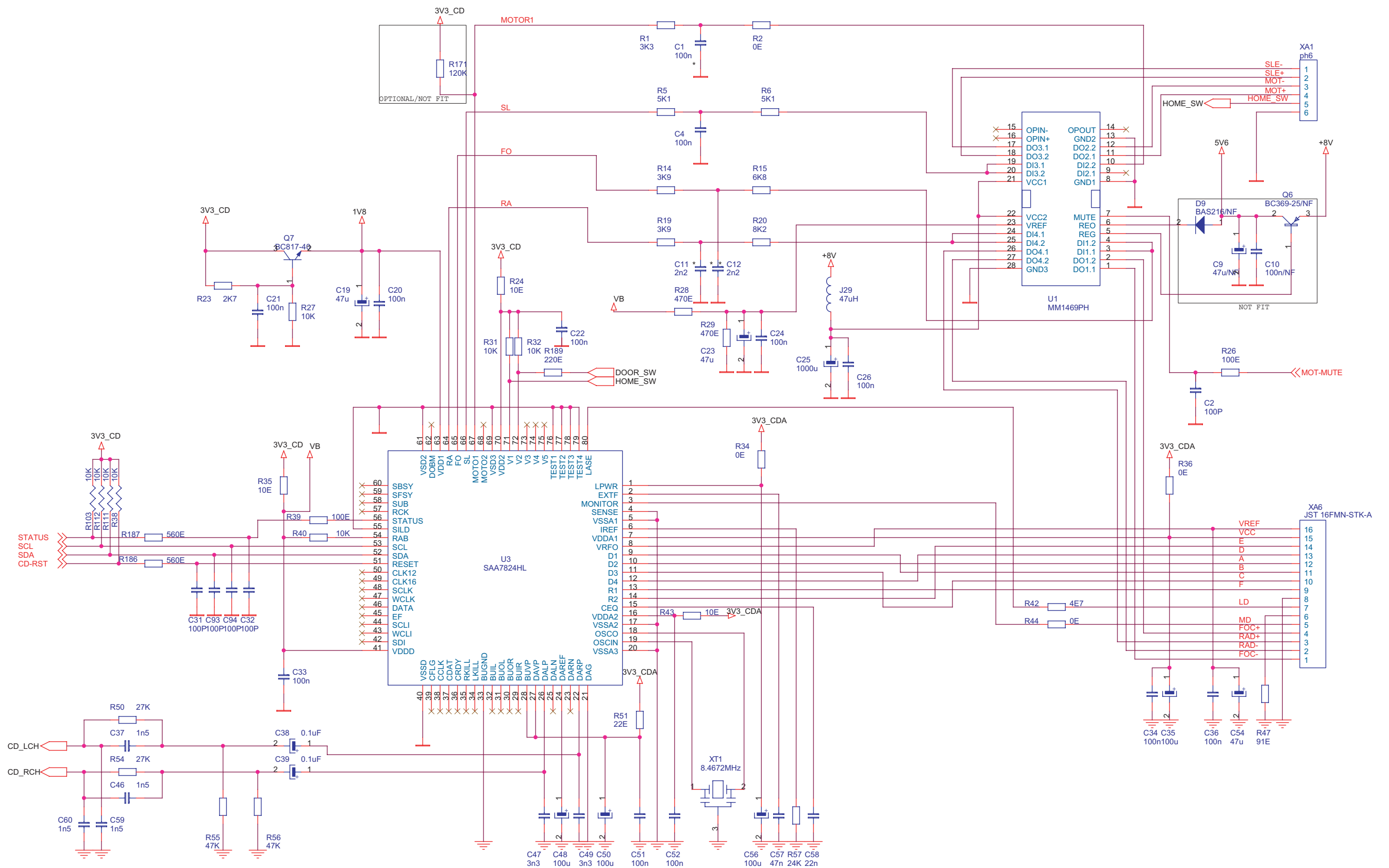
³⁾ LW has to be aligned before MW.

↑ Repeat

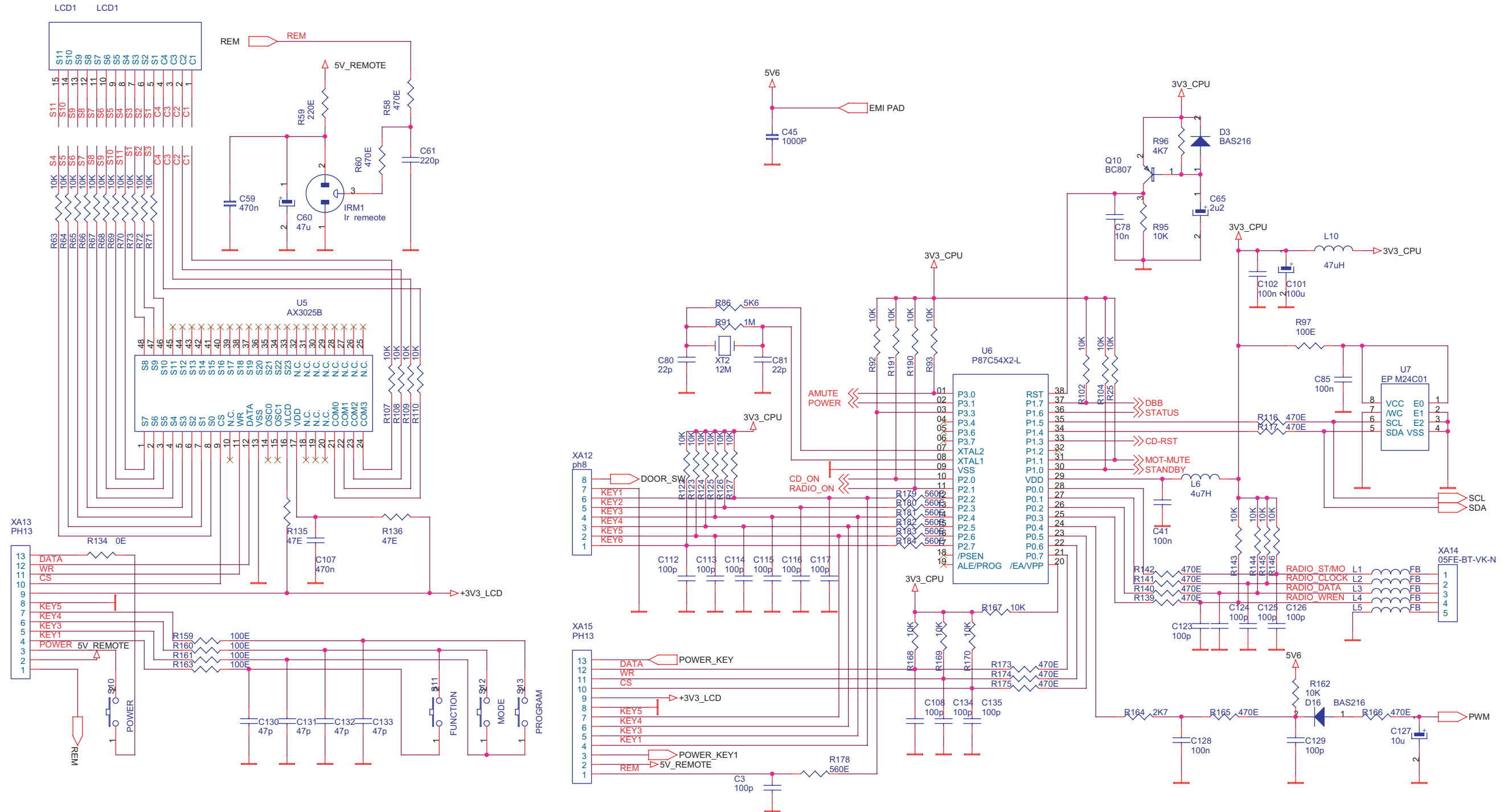
COMBI BOARD - CIRCUIT DIAGRAM (PART 1)



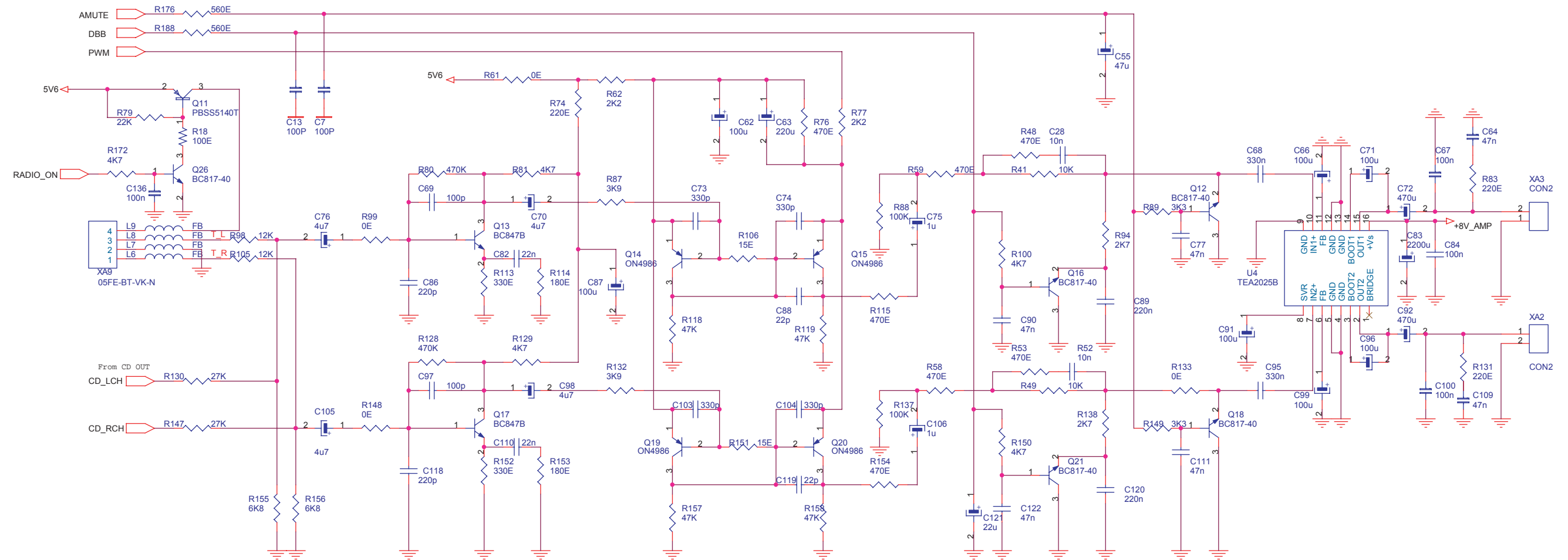
COMBI BOARD - CIRCUIT DIAGRAM (PART 2)



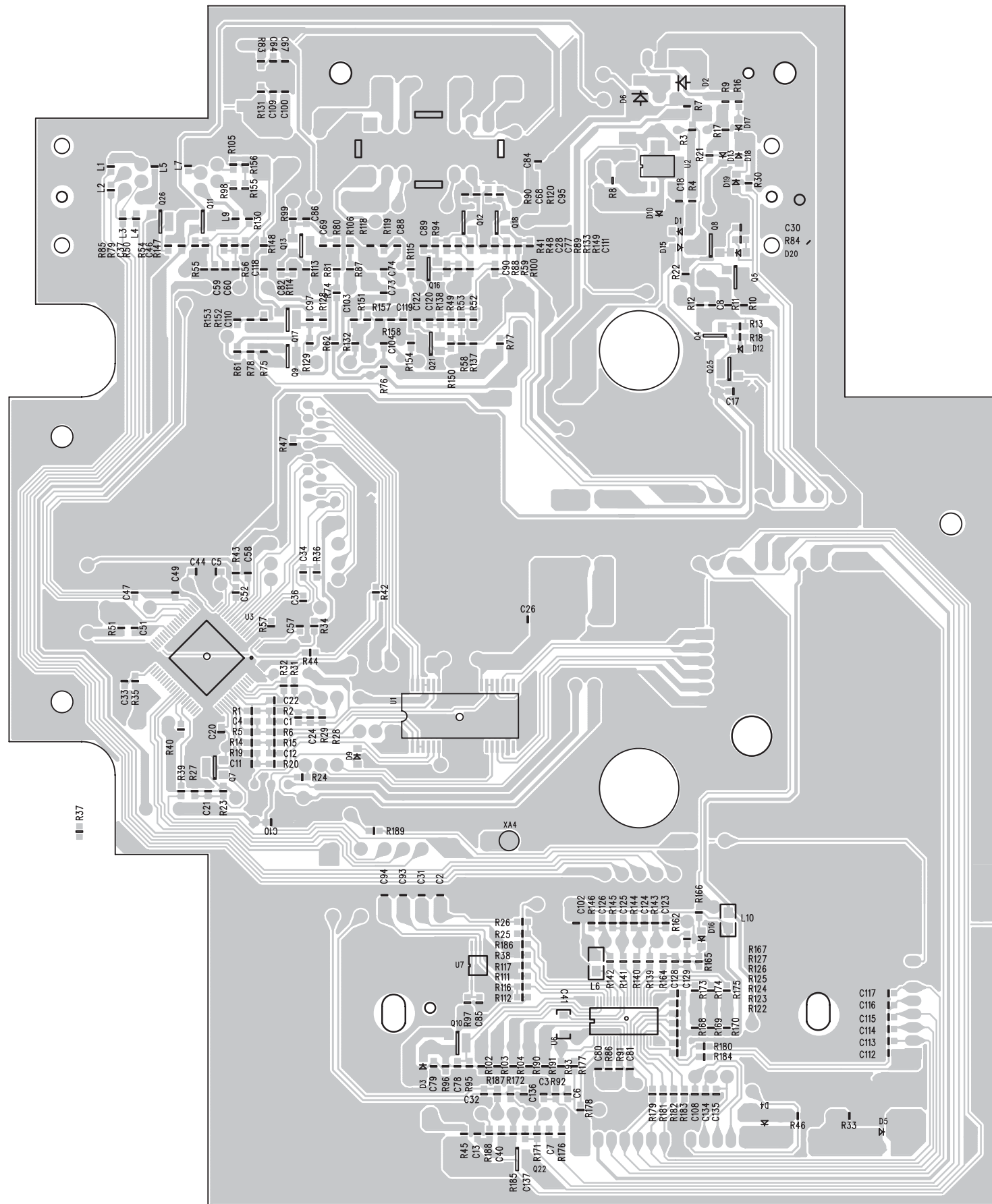
COMBI BOARD - CIRCUIT DIAGRAM (PART 3)



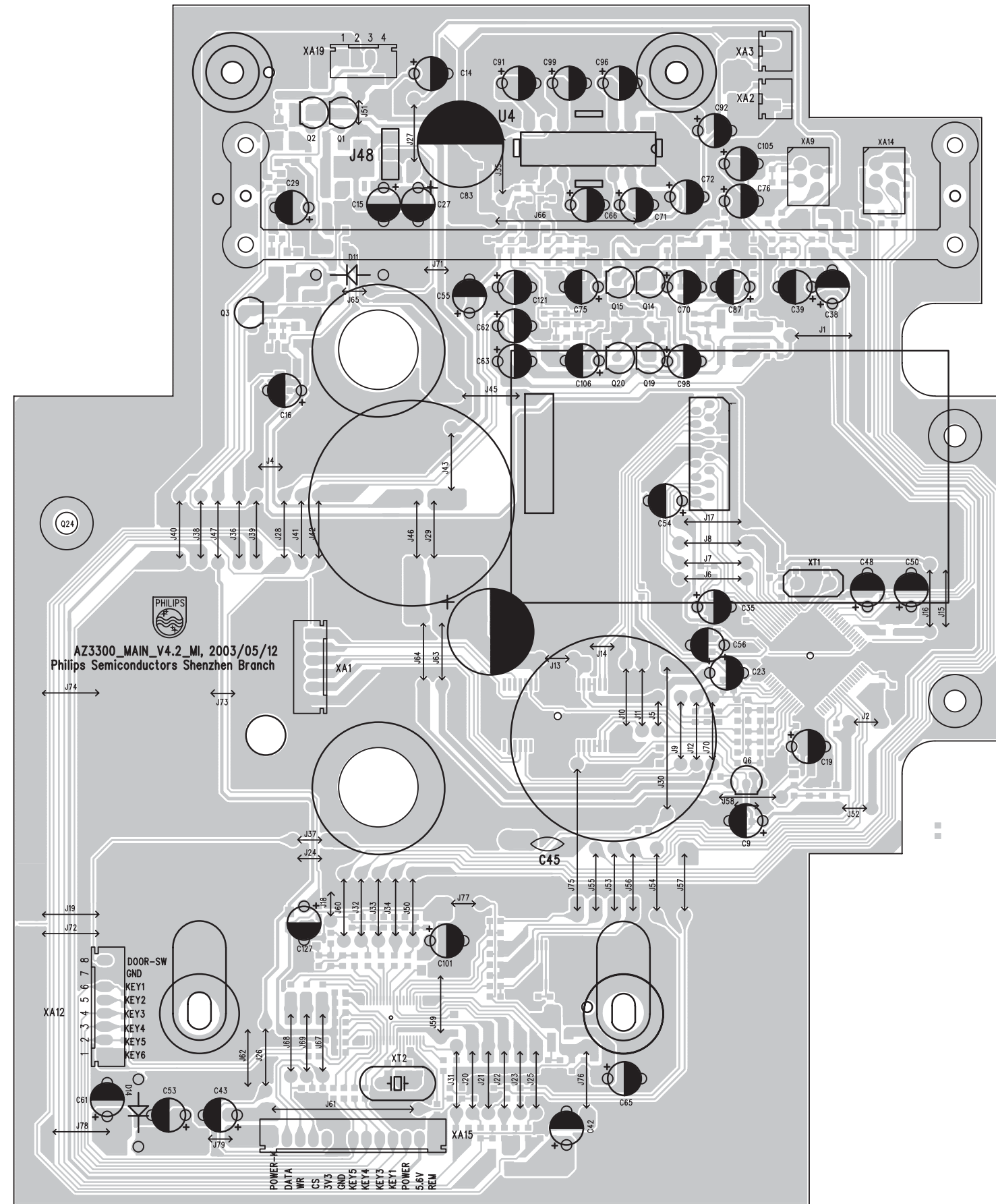
COMBI BOARD - CIRCUIT DIAGRAM (PART 4)



COMBI BOARD - LAYOUT DIAGRAM

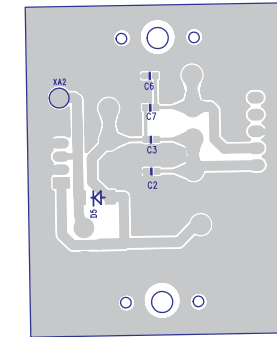
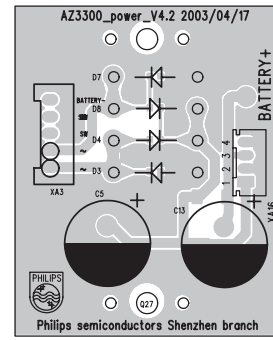


COMBI BOARD - LAYOUT DIAGRAM

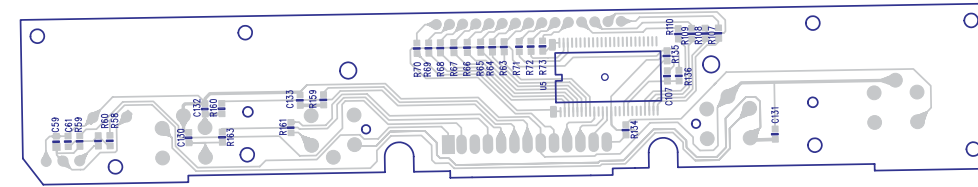
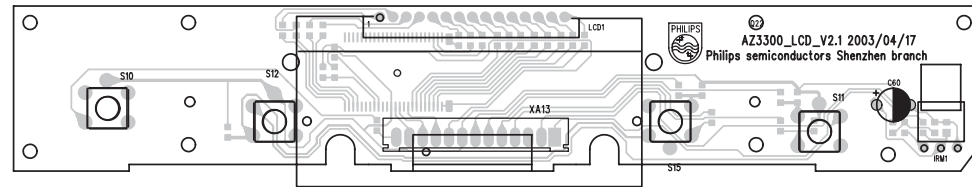


KEY BOARD/LCD BOARD/RECTIFIER BOARD - LAYOUT DIAGRAM

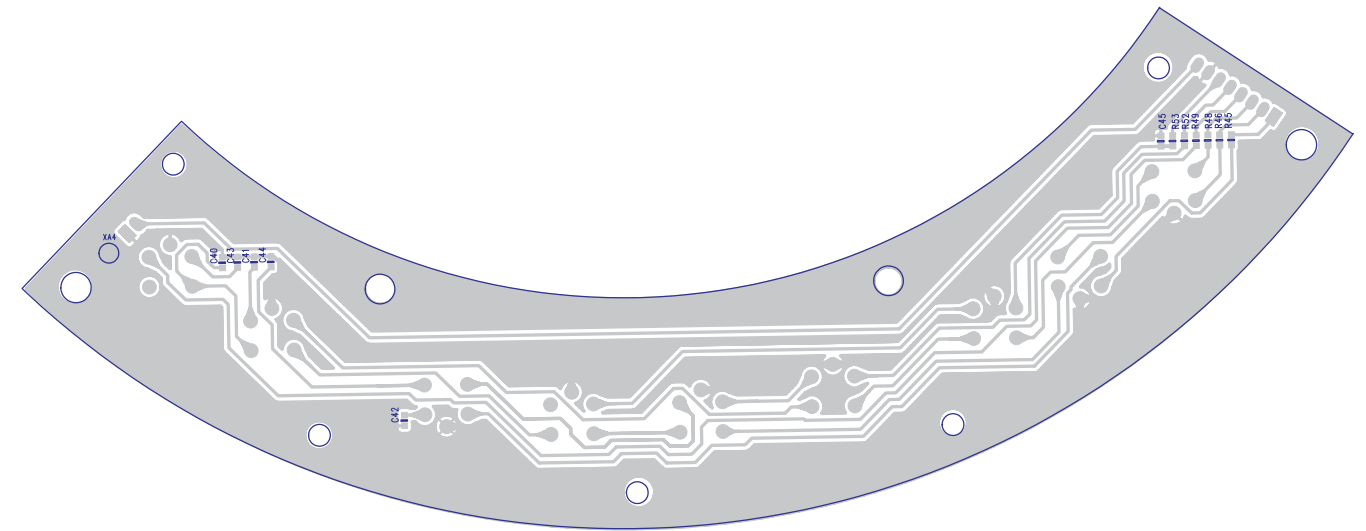
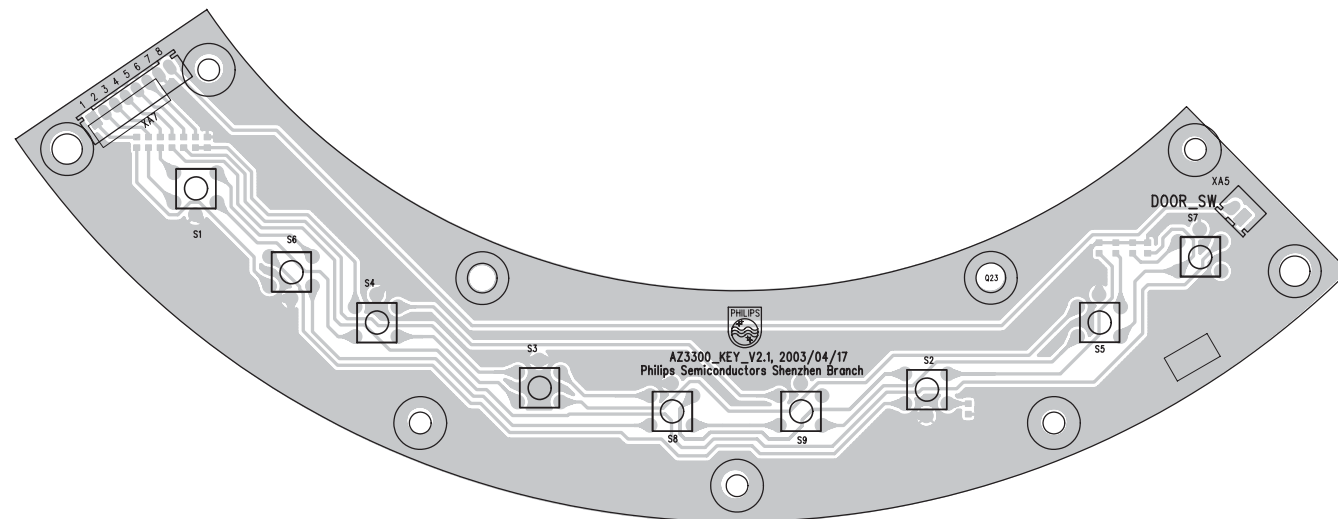
RECTIFIER BOARD



LCD BOARD



KEY BOARD

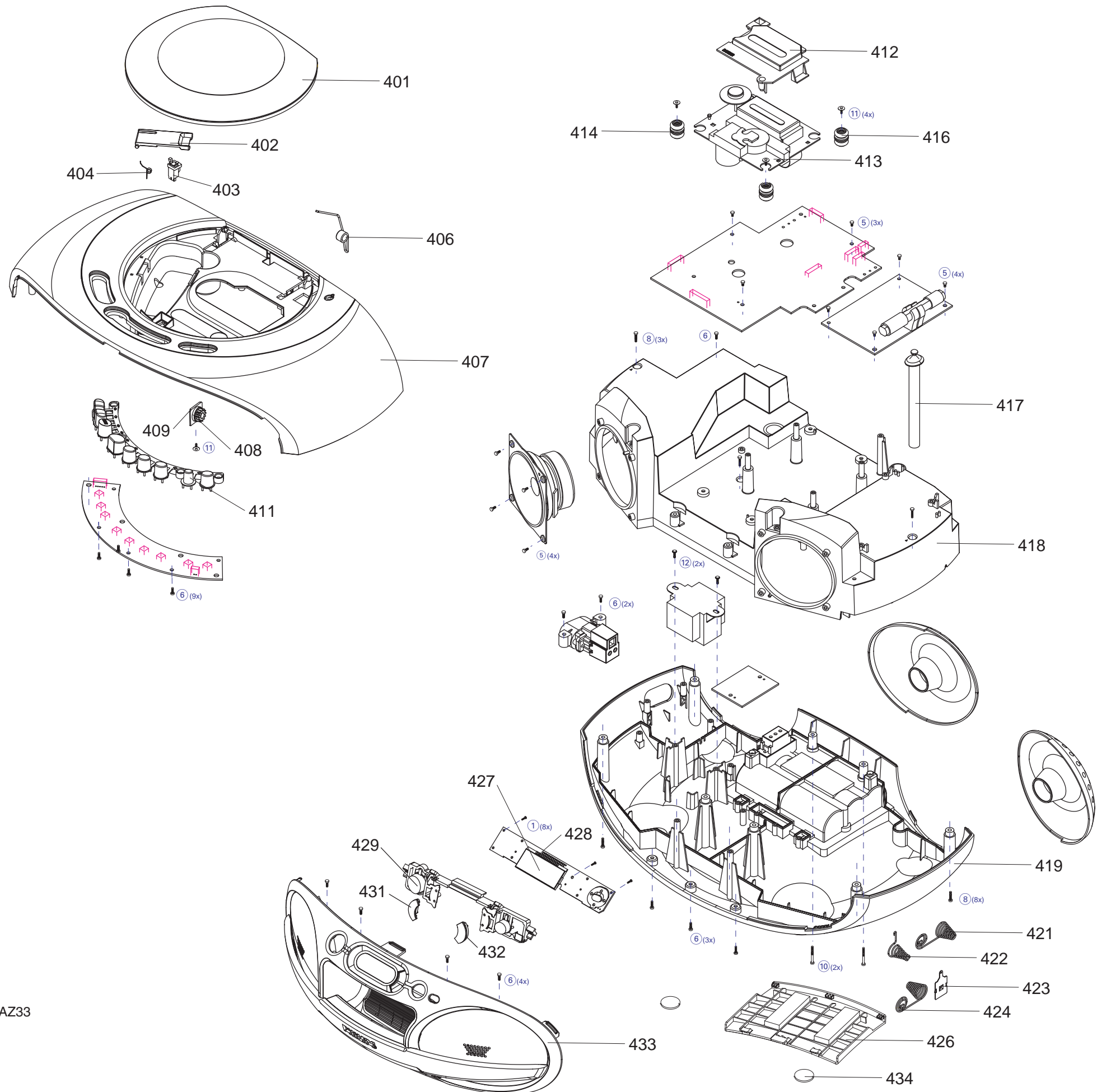


SCREW LIST :

①	M2x6
②	T2 x 8
③	T2 x 10
④	T2.5 x 10
⑤	T3 x 6
⑥	T3 x 10
⑦	T3 x 12
⑧	T3 x 16
⑨	T3 x 20
⑩	T3 x 30
⑪	C P/W 2.5 x 10
⑫	T P/W 3 x 10
⑬	T P/W 3 x 16



MECHANICAL PARTSLIST

401	9965 000 20035	CD DOOR
402	9965 000 20037	REMOTE DOOR
403	9965 000 17275	CD DOOR SWITCH 1P
404	9965 000 20016	SPRING FOR REMOTE DOOR
406	9965 000 19973	SPRING FOR CD DOOR
407	9965 000 20034	TOP CABINET ASSEMBLY
408	9965 000 17264	CD DOOR GEAR
409	9965 000 17265	CD DOOR GEAR HOLDER
411	9965 000 20028	BUTTON-KEYSET DBB
412	9965 000 20040	DUST COVER
413	9965 000 17245	CD MECHANISM TCP11TM2
414	9965 000 20038	CD DAMPER WHITE(40DEG)
416	9965 000 20039	CD DAMPER BLACK(30DEG)
417	9965 000 20021	9 SECTIONS ROD ANTENNA
418	9965 000 20033	MIDDLE CABINET
419	9965 000 20023	BOTTOM BABINET
421	9965 000 20019	BATTERY SPRING A+
422	9965 000 20018	BATTERY SPRING-
423	9965 000 20017	BATTERY PLATE+
424	9965 000 20020	BATTERY SPRING B+
426	9965 000 20036	BATTERY DOOR
427	9965 000 20025	LCD LENS
428	9965 000 20024	BRACKET-LCD
429	9965 000 20032	BUTTON-KEYSET POWER
431	9965 000 20031	BUTTON-KEYSET MODE
432	9965 000 20029	BUTTON-KEYSET PROGRAM
433	9965 000 20022	FRONT CABINET
434	9965 000 20041	RUBBER FOOT
	9965 000 19972	REMOTE CONTROL 20KEYS FOR AZ33



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

ELECTRICAL PARTSLIST**- MISCELLANEOUS -**

XA6	9965 000 17276	SOCKET FFC16P
XA9	9965 000 20042	4P FFC SOCKET
XA14	9965 000 20043	5P FFC SOCKET
	9965 000 20044	SOCKET FFC 16P
1106	9965 000 17271	ANTENNA BAR FLAT
1121	9965 000 20042	4P FFC SOCKET
1122	9965 000 20043	5P FFC SOCKET
	9965 000 20045	5P FFC WHITE COIL
	9965 000 20046	4P FFC SOCKET
LCD1	9965 000 20047	LCD DISPLAY
S10	9965 000 20048	TACT SWITCH
S11	9965 000 20048	TACT SWITCH
S12	9965 000 20048	TACT SWITCH
S13	9965 000 20048	TACT SWITCH
S1	9965 000 20048	TACT SWITCH
S2	9965 000 20048	TACT SWITCH
S3	9965 000 20048	TACT SWITCH
S4	9965 000 20048	TACT SWITCH
S5	9965 000 20048	TACT SWITCH
S6	9965 000 20048	TACT SWITCH
S7	9965 000 20048	TACT SWITCH
S8	9965 000 20048	TACT SWITCH
S9	9965 000 20048	TACT SWITCH
IRM1	9322 155 82667	IR RECEIVER TSOP2236
T1	9965 000 20063	TRANSFORMER (UL) #3300/17
AC2	 9965 000 20051	AC SOCKET
	 9965 000 20052	MAINS CORD

- CAPACITORS & RESISTORS -

2106	9965 000 17282	TRIMMER CAPACITOR
2155	9965 000 17282	TRIMMER CAPACITOR
3142	9965 000 20053	SEMI FIXED VRB100K 3P

- COILS & FILTERS -

XT1	9965 000 16233	CERAMIC RESONATOR
J29	9965 000 20054	CHOKE COIL 47 μ F
J64	9965 000 16232	FXD INDUCTOR 33 μ H
J59	9965 000 17287	FIXED INDUCTOR 1 μ H-J
5109	9965 000 17291	FM CERAMIC FILTER
5110	9965 000 17291	FM CERAMIC FILTER
5130	4822 157 11843	MD7B-01F
5131	4822 157 11843	MD7B-01F
5112	4822 157 70302	F7MCS-12216N
5114	4822 157 70302	F7MCS-12216N
5111	2422 549 44023	IND VAR 7MM 7PY 450KHZ
5119	4822 157 11443	2,4 μ H 10M7
5123	2422 549 44108	IND VAR 7MM 7PY 796KHZ
5104	2422 536 00364	IND FXD ANT 190 μ H 5%
L6	9965 000 20055	CHIP INDUCTOR 4,7 μ H

- COILS & FILTERS -

L10	9965 000 20055	CHIP INDUCTOR 4,7 μ H
XT2	9965 000 20057	CRYSTAL 12MHZ 20pF
5121	9965 000 20059	CRYSTAL 75KHZ 12,5pF

- DIODES -

D11	4822 130 31253	BZX79-C2V4
D14	5322 130 31504	BZX79-B3V3
D3	4822 130 31878	1N4003G
D4	4822 130 31878	1N4003G
D7	4822 130 31878	1N4003G
D8	4822 130 31878	1N4003G
D3	9340 255 30135	BAS216
D5	9340 255 30135	BAS216
D12	9340 255 30135	BAS216
D16	9340 255 30135	BAS216
D17	9340 255 30135	BAS216
D19	9340 255 30135	BAS216
D10	9340 255 30135	BAS216
D20	9340 255 30135	BAS216
6120	9340 255 30135	BAS216
6182	9340 255 30135	BAS216
6183	9340 386 90115	BZX284-C11
6103	5322 130 34337	BAV99
6181	5322 130 34337	BAV99
6130	9340 386 90115	BZX284-C11
6131	9340 386 90115	BZX284-C11
6105	4822 130 83075	HN1V02H-B
D5	9965 000 20056	SMD SCHOTTKY BARRIER DIO
D2	9965 000 20056	SMD SCHOTTKY BARRIER DIO
D6	9965 000 20056	SMD SCHOTTKY BARRIER DIO

- IC & TRANSISTORS -

Q14	4822 130 44568	BC557B
Q15	4822 130 44568	BC557B
Q19	4822 130 44568	BC557B
Q20	4822 130 44568	BC557B
Q3	5322 130 44647	BC368
Q2	9965 000 20058	PBSS53508,126TAPE
Q4	9965 000 16235	TRANS PBSS5140T
Q11	9965 000 16235	TRANS PBSS5140T
Q5	4822 130 42615	BC817-40
Q7	4822 130 42615	BC817-40
Q8	4822 130 42615	BC817-40
Q12	4822 130 42615	BC817-40
Q16	4822 130 42615	BC817-40
Q18	4822 130 42615	BC817-40
Q21	4822 130 42615	BC817-40

ELECTRICAL PARTSLIST

- IC & TRANSISTORS -

Q25	4822 130 42615	BC817-40
Q26	4822 130 42615	BC817-40
Q13	5322 130 42755	BC847C
Q17	5322 130 42755	BC847C
Q10	5322 130 60123	BC807-40
Q22	5322 130 60123	BC807-40
7102	4822 130 42131	BF550
7111	5322 130 42755	BC847C
7181	5322 130 42755	BC847C
7182	5322 130 42755	BC847C
7183	5322 130 42755	BC847C
7180	5322 130 60508	BC857B
U5	9965 000 20062	IC AX3025B-PH
U4	4822 209 61395	TEA2025B
U7	9322 143 49668	M24C01-RDW6
U1	9965 000 16923	IC MM1469AH
U2	9965 000 20060	SA57022-50D
U3	9965 000 17297	IC SAA7824HL/M0D
U6	9965 000 20061	P87C54X2BDH,129
7101	9351 740 80557	IC TEA5757H/V1

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