

Service  
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PRODUCT FAMILY 2004 – CDDA 2 SERIES

# Service Manual



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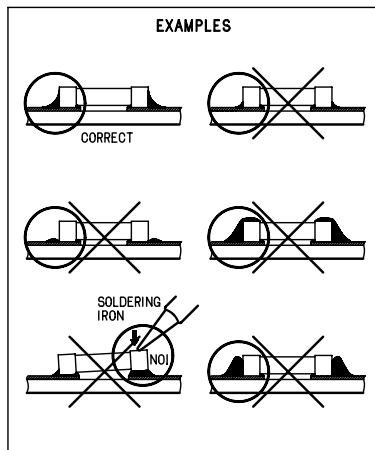
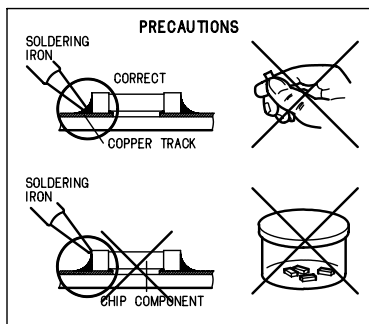
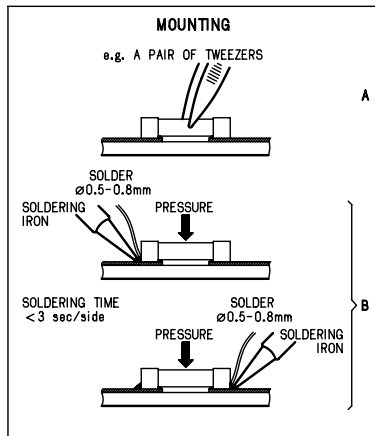
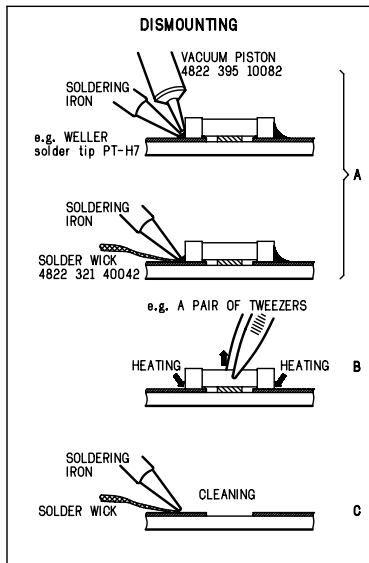
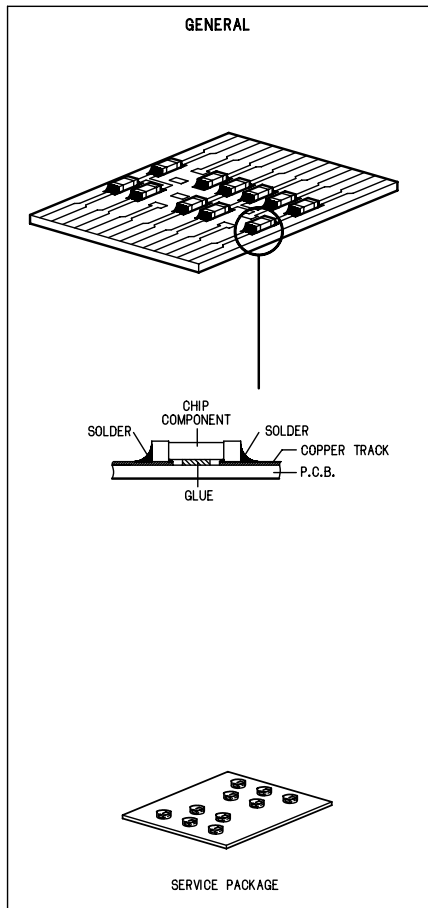
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# HANDLING CHIP COMPONENTS



**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 enfilez le bracelet sorti 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 ridatta 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 ▲

**SAFETY**



**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 ▲

**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 spärrar är urkopplad. Betrakta ej strålen.

**DK Advarsel !**

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

**FIN Varoituis !**

Avatussa laitteessa ja suojalukituksen ohitettaessa olet alttiina näkyvämmälle laserisäteilylle. Älä katso säteeseen !

**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.

**F**

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

## TECHNICAL SPECIFICATION

### General

Dimensions (WxHxD) : 128x31x141 mm  
 Weight without batteries : 205 g

### Power supply modes

DC-in socket : 2.5 - 6.0V  
 Primary batteries (2xLR6) : 1.8 - 3.6V  
 Rechargeable batteries : 1.8 - 3.6V

### Battery lifetime

BATTERY TYPE	
Normal Carbon batteries 2 x R6	≥ 4h (6h typ.)
Normal Alkalite batteries 2 x LR6	≥ 14h (18h typ.)

### Battery level detection

Battery empty : 1.9V nom. +100/-100 mV

### Current consumption CDDA-playback

OPERATION MODE	DC-IN SUPPLY (4.5V)	BATT. SUPPLY (2.25V)
Play-mode	130mA typ.	160mA typ.
Jump-mode	160mA typ.	200mA typ.
Stand-by	n.a.	n.a.

### Shock resistance

+X/-X direction : ≥5 g  
 +Y/-Y direction : ≥5 g  
 +Z/-Z direction : ≥up to 10 g

### Headphone out (measured with 16Ω load, DBB/ESP off)

Output power (THD=10%) : 2x4.5mW (+1/-3dB)  
 Frequency response (1mW) : 100Hz-20kHz within 6dB  
 S/N ratio (unwght) : ≥78dB (81dB typ.)  
 S/N ratio (A-wght) : ≥82dB (84dB typ.)  
 THD+N (1kHz, 1mW) : ≤1% (0.2% typ.)  
 Channel crosstalk (1kHz, no load) : ≤33dB (33dB typ.)  
 Channel unbalance (-40dB) : ≤4dB  
 Volume attenuation (1kHz) : ≥60dB

### Dynamic Bass Boost DBB

DBB STAGE	Frequency response		
	63kHz	1kHz	10kHz
DBB	+5dB ±2dB	0dB ±2dB	0dB ±2dB

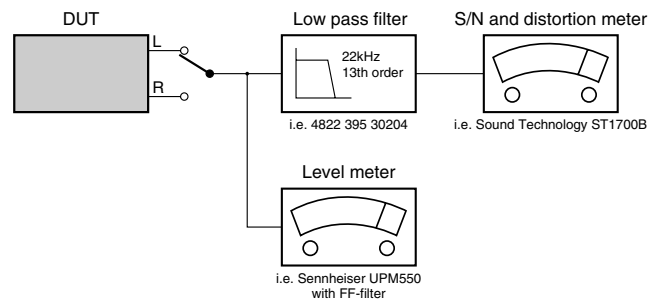
### Laser

Output power : <5mW (3mW typ.)  
 Wavelength : 780nm

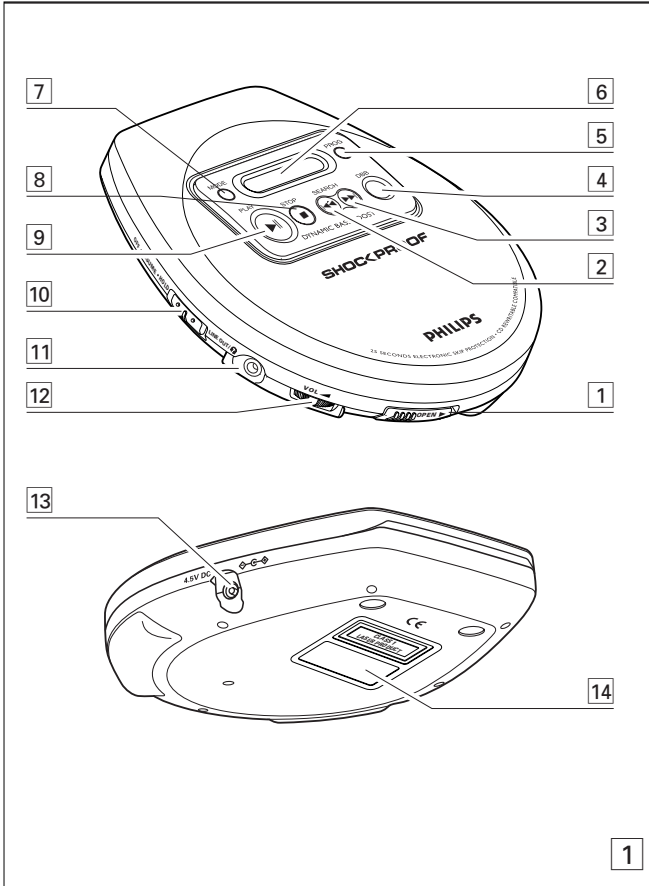
### Measurement setup

Use Audio Signal disc SBC429

4822 397 30184



# CONNECTIONS AND CONTROLS



## English

## CONTROLS / POWER SUPPLY

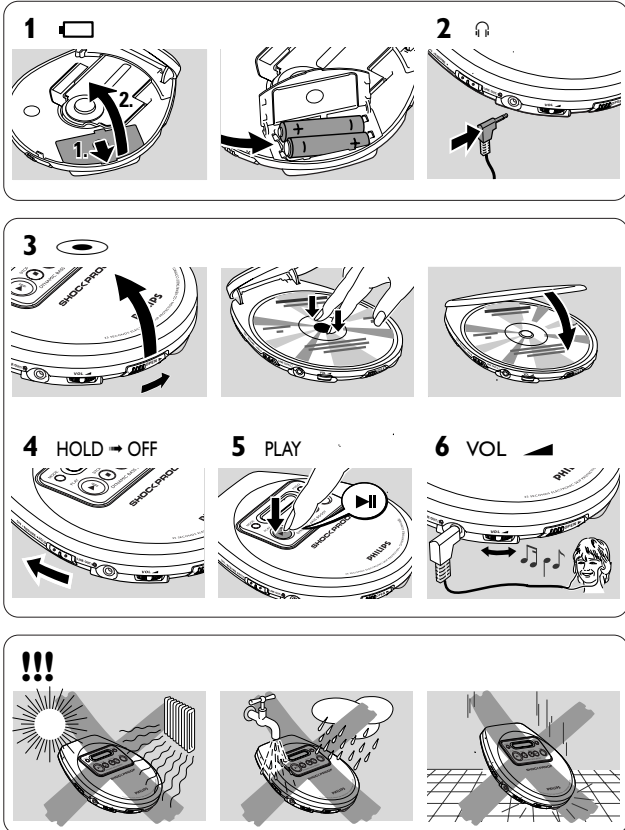
- 1 OPEN ► .....opens the CD lid
- 2 ◀◀ .....skips and searches CD tracks backwards
- 3 ▶▶ .....skips and searches CD tracks forwards
- 4 DBB .....switches the bass enhancement on and off. This button also switches acoustic feedback (the beep) on/off when it is pressed for more than 2 seconds
- 5 PROG .....programs tracks and reviews the program
- 6 .....display
- 7 MODE .....selects the different playing possibilities: **SHUFFLE**, **SHUFFLE REPEAT ALL**, **REPEAT**, **REPEAT ALL** and **SCAN**
- 8 ■ .....stops CD play, clears a program or switches the player off
- 9 ▶|| .....switches the player on, starts or pauses CD play
- 10 RESUME .....stores the last position of a CD track played  
HOLD .....locks all buttons  
OFF .....switches RESUME and HOLD off
- 11 LINE OUT/🔊 .....3.5 mm headphone socket, socket to connect the player to another audio input of an additional appliance.
- 12 VOL ▲ .....adjusts the volume
- 13 4.5V DC .....socket for external power supply
- 14 .....type plate

### CAUTION

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

## QUICK START

## MISE EN SERVICE RAPIDE



## Batteries (supplied or optionally available)

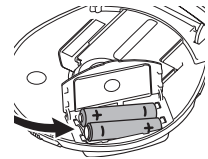
You can use the following batteries with this CD-player:

- normal batteries type **LR6**, **UM3** or **AA** (preferably Philips), or
- alkaline batteries type **LR6**, **UM3** or **AA** (preferably Philips).

Notes: – Old and new or different types of batteries should not be combined.  
– Remove batteries if they are empty or if the player is not going to be used for a long time.

### Inserting batteries

- 1 Push OPEN ► to open the CD lid.
- 2 Open the battery compartment and insert either 2 normal or alkaline batteries.



### Battery indication

The approximate power level of your batteries is shown in the display.

- Battery full
- Battery two-thirds full
- Battery one-third full
- Battery dead or empty. When the batteries are dead or empty, the symbol flashes, **bAtte** is displayed, and the beep tone sounds repeatedly.



**Batteries contain chemical substances, so they should be disposed of properly.**

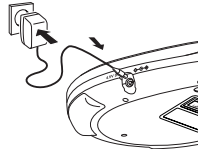
## INSTRUCTION FOR USE

### POWER SUPPLY / GENERAL INFORMATION

Use only the AY 3170 adapter (4.5 V / 300 mA direct current, positive pole to the center pin). Any other product may damage the player.

- 1 Make sure the local voltage corresponds to the power adapter's voltage.
- 2 Connect the power adapter to the 4.5V DC socket of the player and to the wall socket.

Note: Always disconnect the adapter when you are not using it.

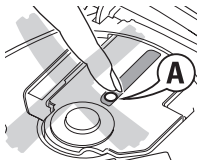


### Environmental information

- All redundant packing material has been omitted. We have done our utmost to make the packaging easily separable into two materials: cardboard (box) and polyethylene (bags, protective foam sheet).
- Your set consists of materials which can be recycled if disassembled by a specialized company. Please observe the local regulations regarding the disposal of packing materials, exhausted batteries and old equipment.

**This product complies with the radio interference requirements of the European Union.**

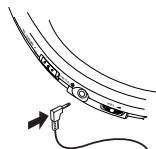
- Do not touch the lens (A) of the CD player.
- Do not expose the unit, batteries or CDs to humidity, rain, sand or excessive heat (caused by heating equipment or direct sunlight).
- You can clean the CD player with a soft, slightly dampened, lint-free cloth. Do not use any cleaning agents as they may have a corrosive effect.
- To clean the CD, wipe it in a straight line from the center toward the edge using a soft, lint-free cloth. A cleaning agent may damage the disc! Never write on a CD or attach a sticker to it.
- The lens may cloud over when the unit is moved suddenly from cold to warm surroundings. Playing a CD is not possible then. Leave the CD player in a warm environment until the moisture has evaporated.
- Active mobile phones in the vicinity of the CD player may cause malfunctions.
- Avoid dropping the unit as this may cause damage.



### Headphones HE 035

- Connect the supplied headphones to the LINE OUT/ear jack of the player.

Note: LINE OUT/ear jack can also be used for connecting this set to your HiFi system. To adjust the sound and volume, use the controls on the connected audio equipment and on the CD player.



### IMPORTANT!

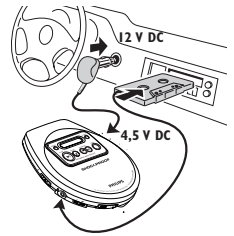
Hearing safety: Do not play your headphones at a high volume. Hearing experts advise that continuous use at high volume can permanently damage your hearing.

Traffic safety: Do not use headphones while driving a vehicle. It may create a hazard and it is illegal in many countries. Even if your headphones are an open-air type designed to let you hear outside sounds, do not turn up the volume so high that you cannot hear what is going on around you.

### GENERAL INFORMATION / CD PLAY

Only use the AY 3545 (4822 219 10033) or AY 3548 (3140 118 71890) car voltage converter (4.5 V DC, positive pole to the centre pin) and the AY 3501 car adapter cassette. Any other product may damage the set.

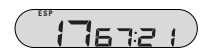
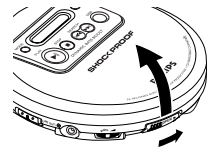
- 1 Put the set on a horizontal, vibration-free and stable surface. Make sure it is in a safe place, where the set is neither a danger nor an obstacle to the driver and the passengers.
  - 2 Plug the voltage converter into the cigarette lighter socket (**only for 12 V car battery, negative grounding**), then connect the wired end with 4.5V DC input socket on the set.
  - 3 If necessary, clean the cigarette lighter socket to obtain a good electrical contact.
  - 4 Turn down the volume and connect the cassette adapter plug to LINE OUT/ear jack on the set.
  - 5 Carefully insert the cassette adapter into the car radio's cassette compartment.
  - 6 Make sure the cord does not hinder your driving.
  - 7 Decrease the volume on the set, if necessary. Start playback on the set and adjust the sound with the car radio controls.
- **Always remove the voltage converter from the cigarette lighter socket when the set is not in use.**



Note: If your car radio has a LINE IN socket, it is better to use it for the car radio connection instead of the cassette adapter. Connect the signal lead to this LINE IN socket and to LINE OUT/ear jack on the set.

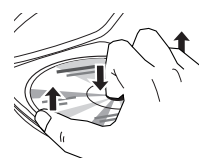
This CD-player can play all kinds of **Audio Discs** such as CD-Recordables and CD-Rewritables. Do not try to play a CD-ROM, CDi, VCD, DVD or computer CD.

- 1 Push the OPEN ► slider to open the player.
- 2 Insert an audio CD, printed side up, by pressing the CD onto the hub.
- 3 Close the player by pressing the lid down.
- 4 Press ►► to switch the player on and start playback. ►► The current track number and elapsed playing time are displayed.
- You can pause playback by pressing ►►. ►► The time at which playback was paused starts flashing.
- You can continue playback by pressing ►► again.
- 5 Press ■ to stop playback. ►► The total number of tracks and the total playing time of the CD are displayed.
- 6 Press ■ again to switch the player off.



- To remove the CD, hold it by its edge and press the hub gently while lifting the CD.

Note: If there is no activity, the set will automatically switch off after a while to save energy.




# INSTRUCTION FOR USE

## CD PLAY / FEATURES

- If a CD-Recordable (CD-R) or a CD-Rewritable (CD-RW) is not recorded properly, *no CD* is displayed, indicating that the CD has not been finalized. In that case, use FINALIZE on your CD recorder to complete the recording.
- When playing a CD-Rewritable (CD-RW), please note that it takes 3–15 seconds after pressing **▶II** for sound reproduction to start.
- Playback will stop if you open the CD lid.
- While the CD is read, *CD* flashes in the display.

### Volume and bass

#### Volume adjustment

- Adjust the volume by using VOL .

#### Bass adjustment

- Press DBB to switch the bass enhancement on or off  
→ **DBB** appears if the bass enhancement is activated.



### Selecting a track and searching

#### Selecting a track during playback

- Briefly press **◀▶** or **▶▶** once or several times to skip to the current, previous or next track.  
→ Playback continues with the selected track, and the track's number is displayed.

#### Selecting a track when playback is stopped

- 1 Briefly press **◀▶** or **▶▶** once or several times to select the desired track. The track number is displayed.
- 2 Press **▶II** to start CD play.  
→ Playback starts with the selected track.

#### Searching for a passage during playback

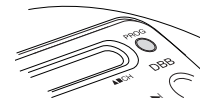
- 1 Keep **◀▶** or **▶▶** pressed to find a particular passage in a backward or forward direction.  
→ Searching starts while playback continues at low volume. After 2 seconds the search speeds up.
- 2 Release the button when you reach the desired passage.  
→ Playback continues from this position.

Notes: – If the player is in SCAN mode (see MODE chapter), searching is not possible.  
– In shuffle, shuffle repeat all or repeat mode (see MODE chapter), or while playing a program, searching is only possible within the particular track.

## FEATURES

You can store up to 30 tracks to play in a program. A single track may be stored more than once in the program.

- 1 While playback is stopped, select a track with **◀▶** or **▶▶**.
- 2 Press PROG to store the track.  
→ **PROG** lights up; the track number programmed and **P** with the total number of stored tracks are displayed.
- 3 Select and store all desired tracks in this way.
- 4 Press **▶II** to start playback of your selected tracks.  
→ **PROG** is shown and playback starts.



- You can review the program by pressing PROG for more than 2 seconds.  
→ The display shows all the stored tracks in sequence.

Notes: – If you press PROG and there is no track selected, *SELECT* is displayed.  
– If you try to store more than 30 tracks, *FULL* is displayed.



#### Clearing the program

- While playback is stopped, press **■** to clear program.  
→ *CLEAR* is displayed once, **PROG** goes off, and the program is cleared.

Note: The program will also be cleared if the power supply is interrupted, or if the CD-player lid is opened, or if the set switches off automatically.



### Selecting different playing possibilities-MODE

It is possible to play tracks in random order, to repeat a single track or the entire CD, and to play the first few seconds of each track.

- 1 Press MODE during playback as often as required in order to activate one of the following 'modes'. The active mode is shown in the display.  
→ **SHUFFLE**: All tracks of the CD are played in random order until all of them have been played once.  
→ **SHUFFLE REPEAT ALL**: All tracks of the CD are played repeatedly in random order.  
→ **REPEAT**: The current track is played repeatedly.  
→ **REPEAT ALL**: The entire CD is played repeatedly.  
→ **SCAN**: The first 10 seconds of each of the remaining tracks are played in sequence.



- 2 Playback starts in the chosen mode after 2 seconds.

- To return to normal playback, press MODE repeatedly until the display shows no active modes.

#### ESP

With a conventional portable CD-player you might have experienced that the music stopped e.g. when you were jogging. The **Electronic Skip Protection** prevents loss of sound caused by light vibrations and shocks. Continuous playback is ensured. However ESP does not prevent playback interruptions during vigorous running. It also does not protect the unit against any damage caused by dropping!

In this set ESP is default ON. It is possible to set ESP off.

- Press MODE for more than 2 seconds.  
→ **ESP** disappears.
- Press MODE again for more than 2 seconds.  
→ **ESP** is displayed.

**ESP on → ESP off → ESP on**

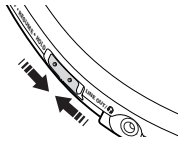
## INSTRUCTION FOR USE

### FEATURES / TROUBLESHOOTING

You can interrupt playback and continue (even after an extended period of time) from the position where playback stopped (RESUME) and you can lock all buttons of the set so that no action will be executed (HOLD). Use the RESUME–HOLD–OFF slider for these functions.

#### RESUME – continuing from where you have stopped

- 1 Switch the slider to RESUME during playback to activate RESUME.  
→ **RESUME** is shown.
  - 2 Press **■** whenever you want to stop playback.
  - 3 Press **▶||** whenever you want to resume playback.  
→ **RESUME** is shown and playback continues from where you have stopped.
- To deactivate RESUME, switch the slider to OFF.  
→ **RESUME** goes off.



#### HOLD – locking all buttons

You can lock the buttons of the set by switching the slider to HOLD. Now, when a key is pressed, no action will be executed. This is of use, for example, when transporting the player in a bag. With HOLD activated, you can avoid accidental activation of other functions.

- 1 Switch the slider to HOLD to activate HOLD.  
→ All buttons are locked. *H o l d* is shown when you press any button. If the set is switched off, **HOLD** will be shown only when **▶||** is pressed.
- 2 To deactivate HOLD, switch the slider to OFF.



*Note: If you deactivate HOLD by switching the slider to RESUME, you will be activating the RESUME function.*

### Troubleshooting

**WARNING:** Under no circumstances should you try to repair the set yourself as this will invalidate the warranty. If a fault occurs, first check the points listed, before taking the unit for repair. If you are unable to solve a problem by following these hints, consult your dealer or service center.

#### The CD player has no power, or playback does not start

- Check that your batteries are not dead or empty, that they are inserted correctly, that the contact pins are clean.
- Your adapter connection may be loose. Connect it securely.
- For in-car use, check that the car ignition is on. Also check player's batteries.

#### The indication *n o d i s c* is displayed

- Check that the CD is clean and correctly inserted (label-side upward).
- If your lens has steamed up, wait a few minutes for this to clear.

#### The indication *n f d i s c* is displayed

- CD-RW (CD-R) was not recorded properly. Use FINALIZE on your CD-recorder.

#### The indication **HOLD** is on and/or there is no reaction to controls

- If HOLD is activated, then deactivate it.
- Electrostatic discharge. Disconnect power or remove batteries for a few seconds.

#### The CD skips tracks

- The CD is damaged or dirty. Replace or clean the CD.
- RESUME, SHUFFLE or PROGRAM is active. Switch off whichever is on.

#### No sound or bad sound quality.

- PAUSE might be active. Press **▶||**.
- Loose, wrong or dirty connections. Check and clean connections.
- Volume might not be appropriately adjusted. Adjust the volume.
- Strong magnetic fields. Check player's position and connections. Also keep away from active mobile phones.
- For in-car use, check that the cassette adapter is inserted correctly, that the car cassette player's playback direction is correct (press autoreverse to change), and that the cigarette lighter jack is clean. Allow time for temperature change.

## ACCESSORIES

ACCESSORIES FOR CD-PORTABLE		AX2200	AX1101	
		/00C /00Z	/00C /00Z	/05Z
AY3170/00 AC/DC ADAPTOR	4822 219 10617		X	
AY3170/05 AC/DC ADAPTOR	3140 118 33610			X
HE035/77 HEADPHONE	9965 000 11492	X	X	X

## SERVICE TOOLS

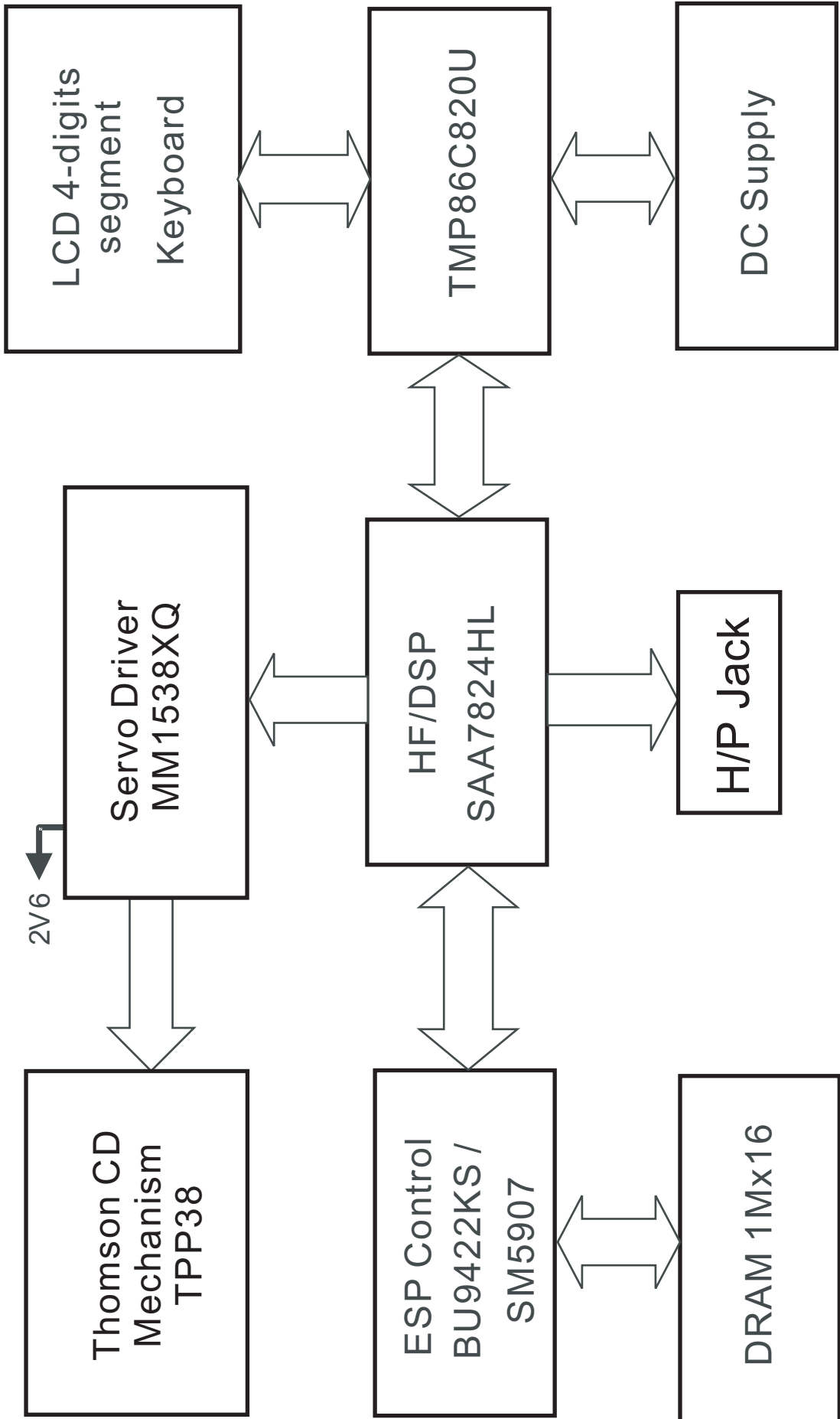
<b>Audio signal disc</b> SBC 429.....	4822 397 30184
<b>Playability test disc</b> SBC 444.....	4822 397 30245
<b>Test disc 5</b> (disc without errors) +	
<b>Test disc 5A</b> (disc with dropout errors, black spots and fingerprints)	
SBC 426/426A.....	4822 397 30096
<b>Burn in test disc</b> (65 min. 1kHz signal at -30 dB level without "pause").....	4822 397 30155
<b>Universal test cassette Fe</b> SBC 420.....	4822 397 30071

## ESD PROTECTION EQUIPMENT

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

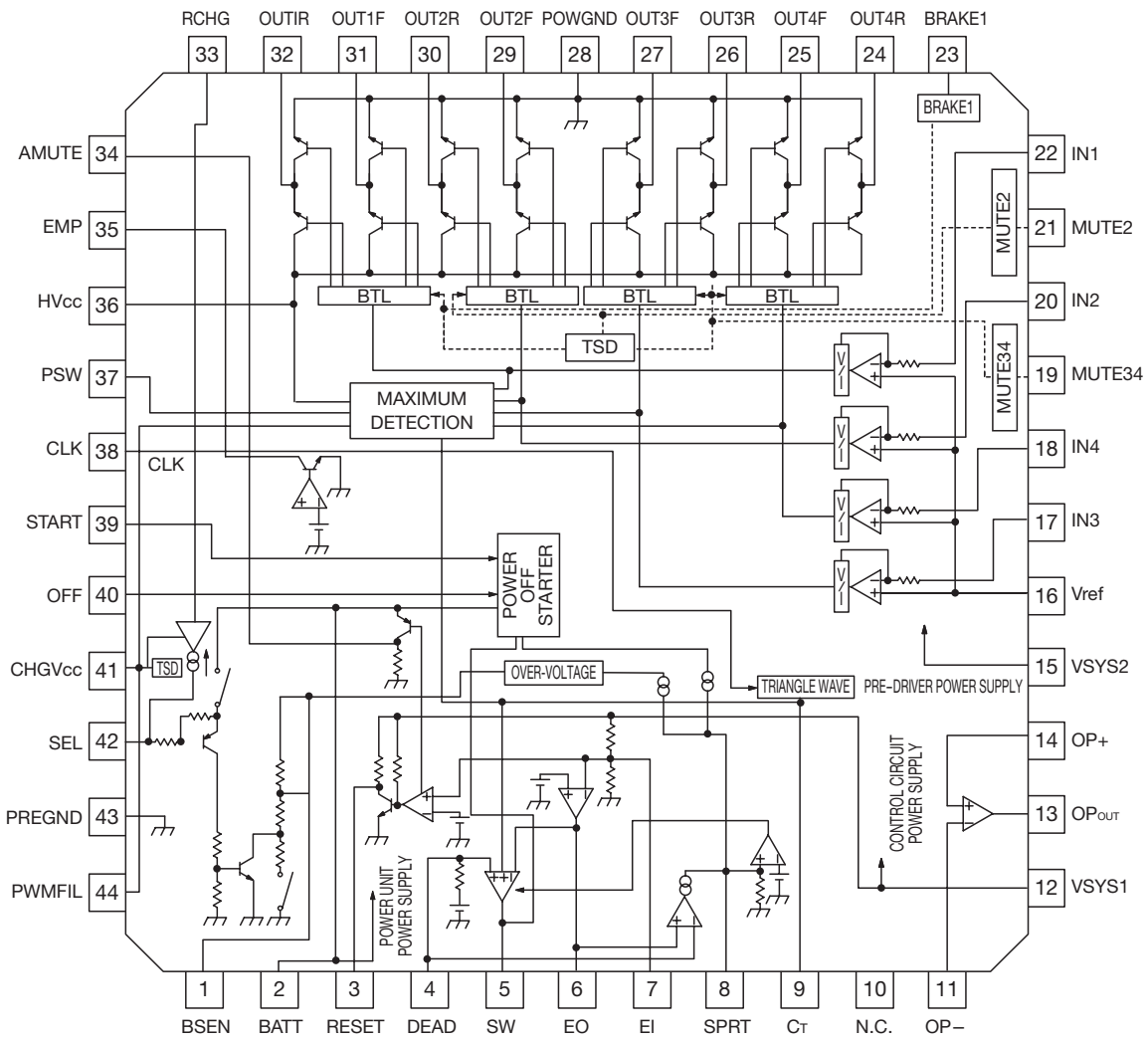


BLOCK DIAGRAM - SET



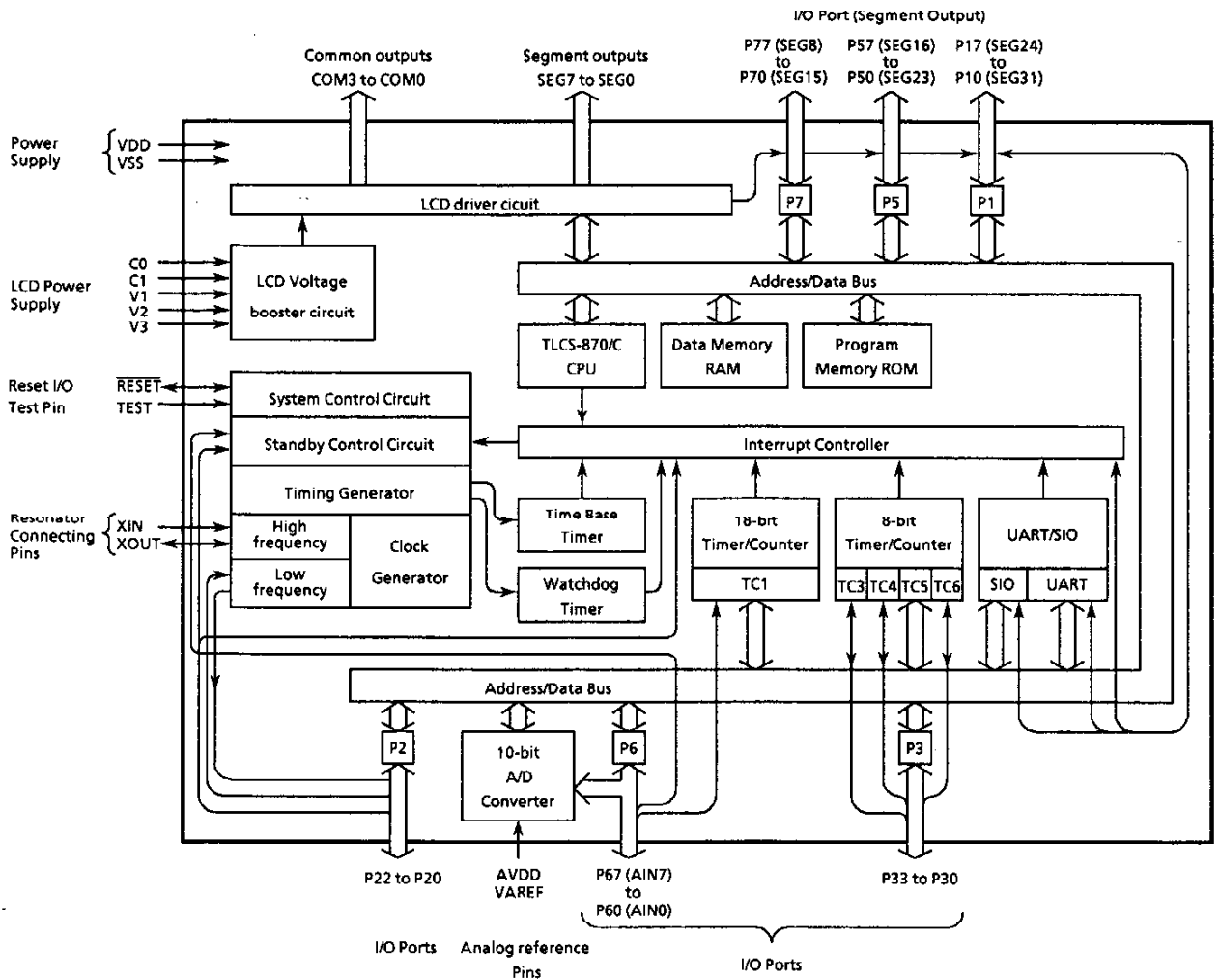
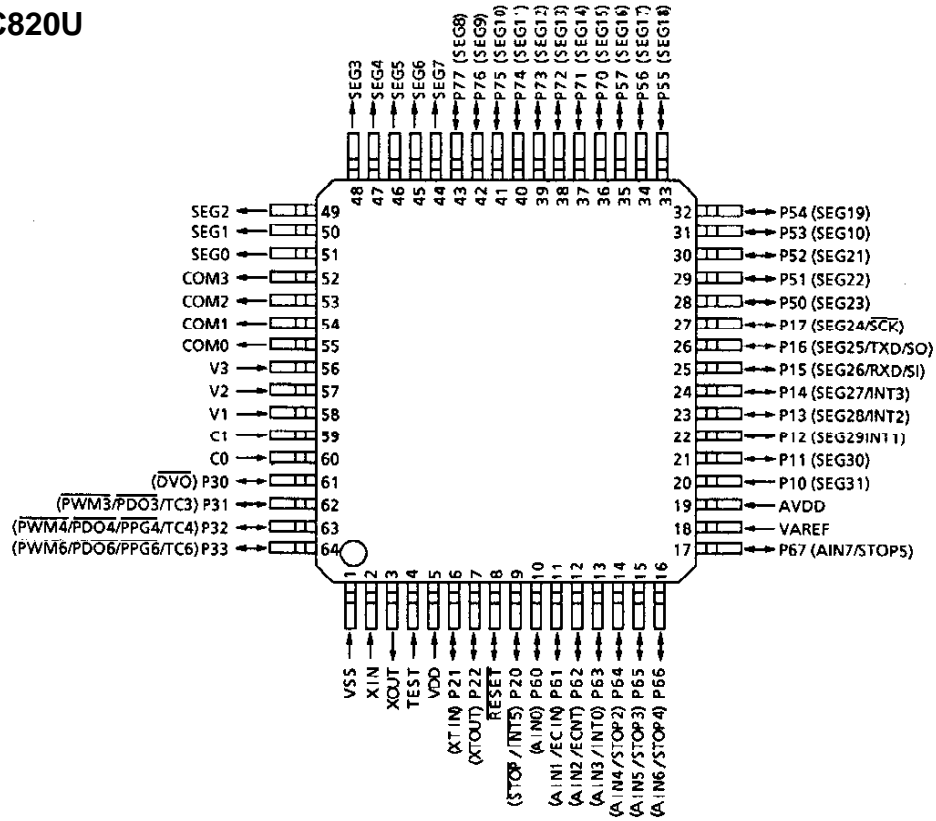
IC BLOCK DIAGRAM

U1: MM1538XQ



IC BLOCK DIAGRAM

U4: TMP86C820U



IC BLOCK DIAGRAM

U5: SAA7824HL

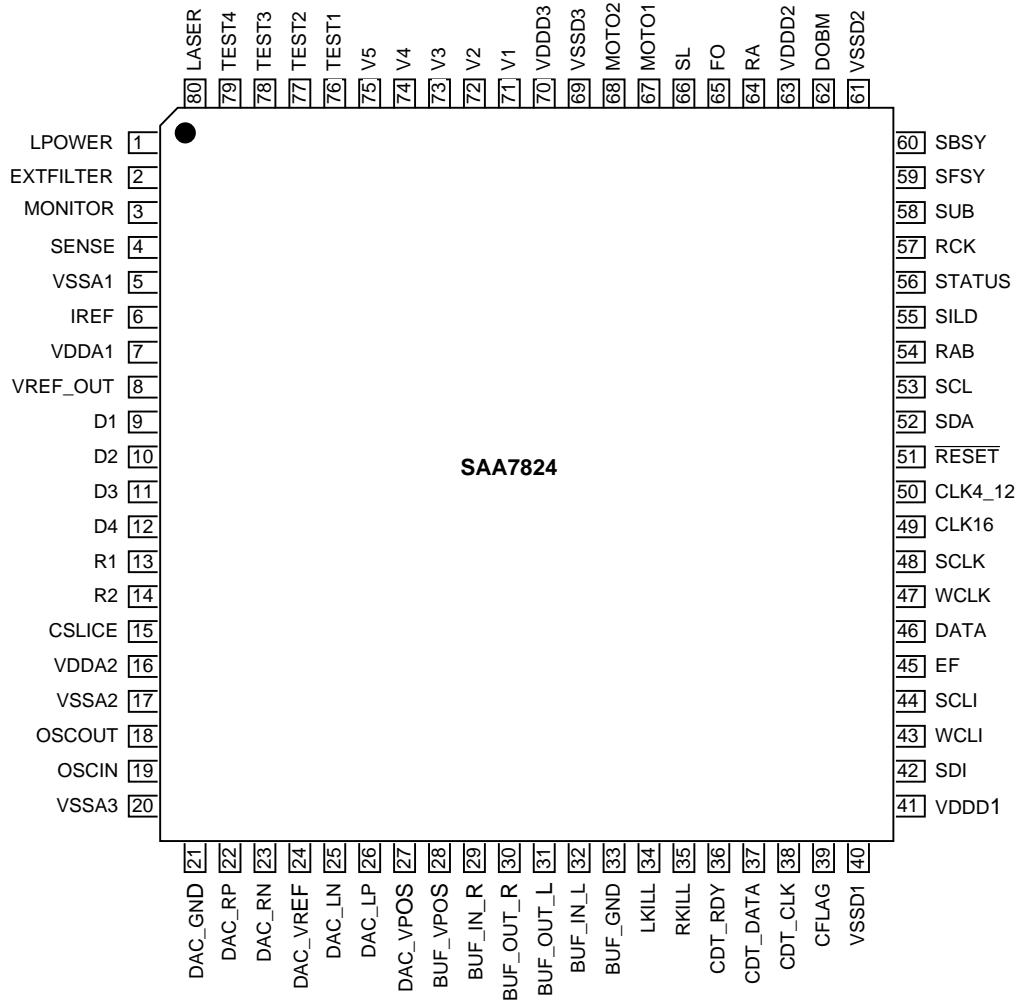
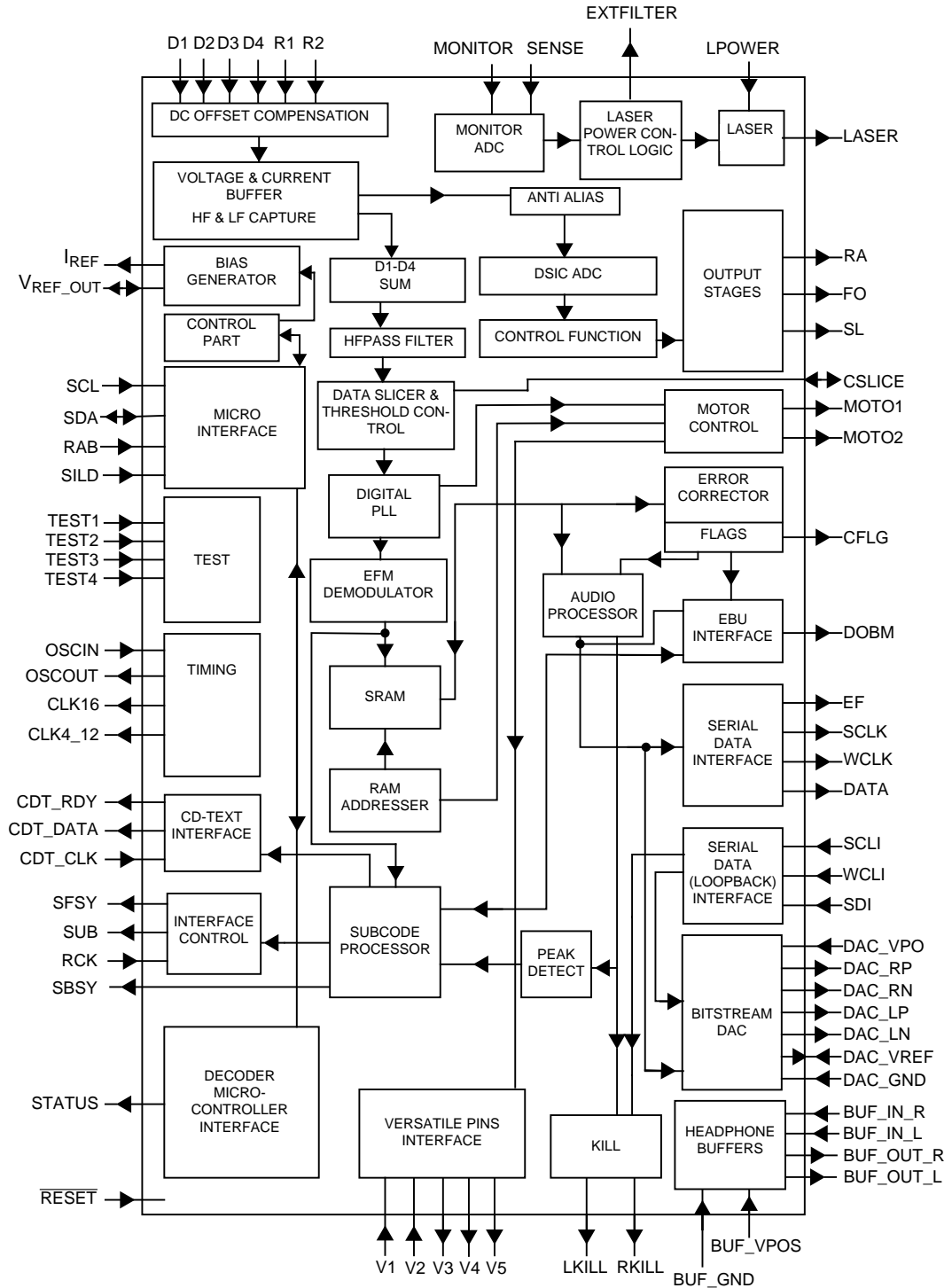


Fig.2 Pin configuration.

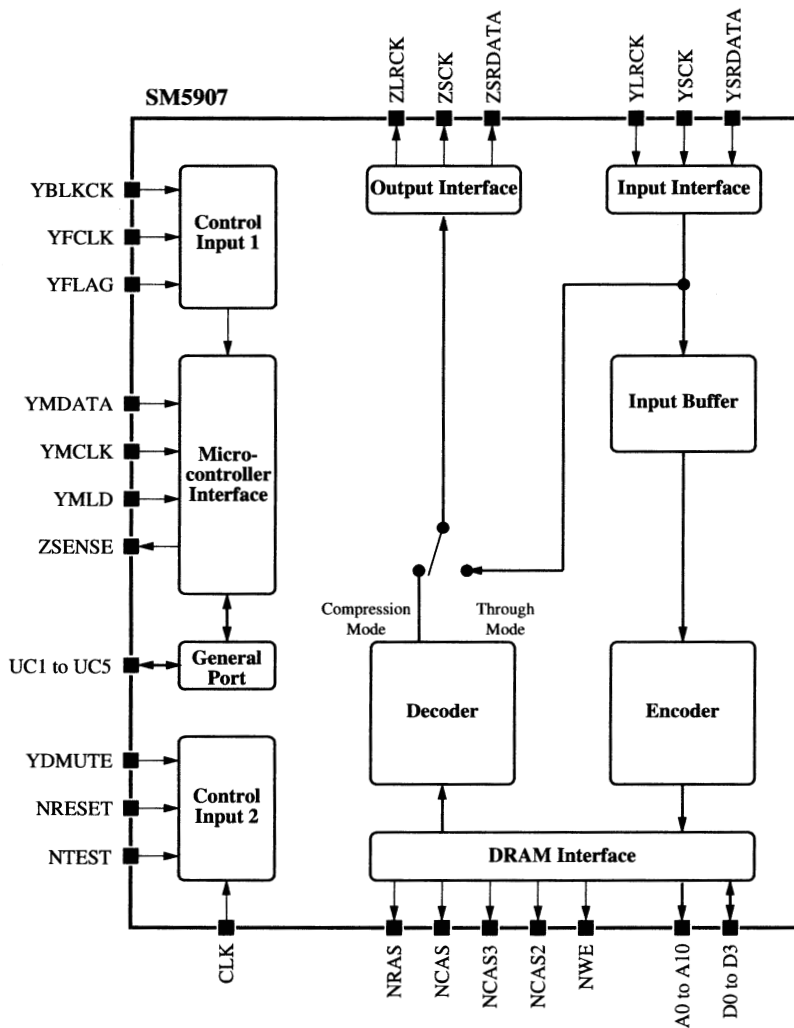
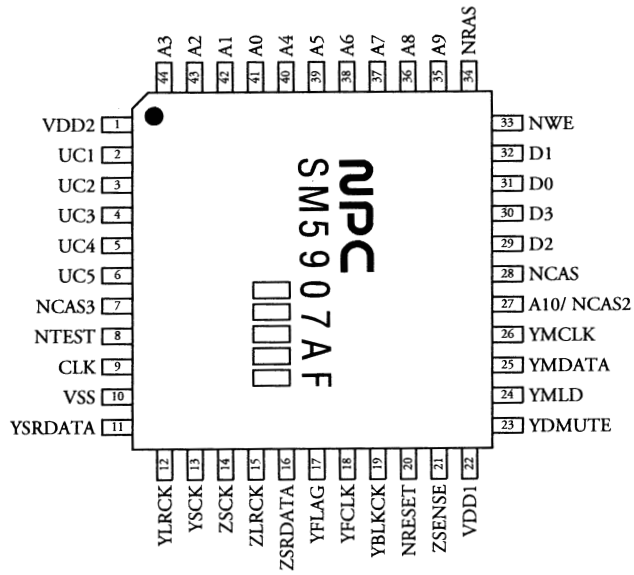
IC BLOCK DIAGRAM

U5: SAA7824HL

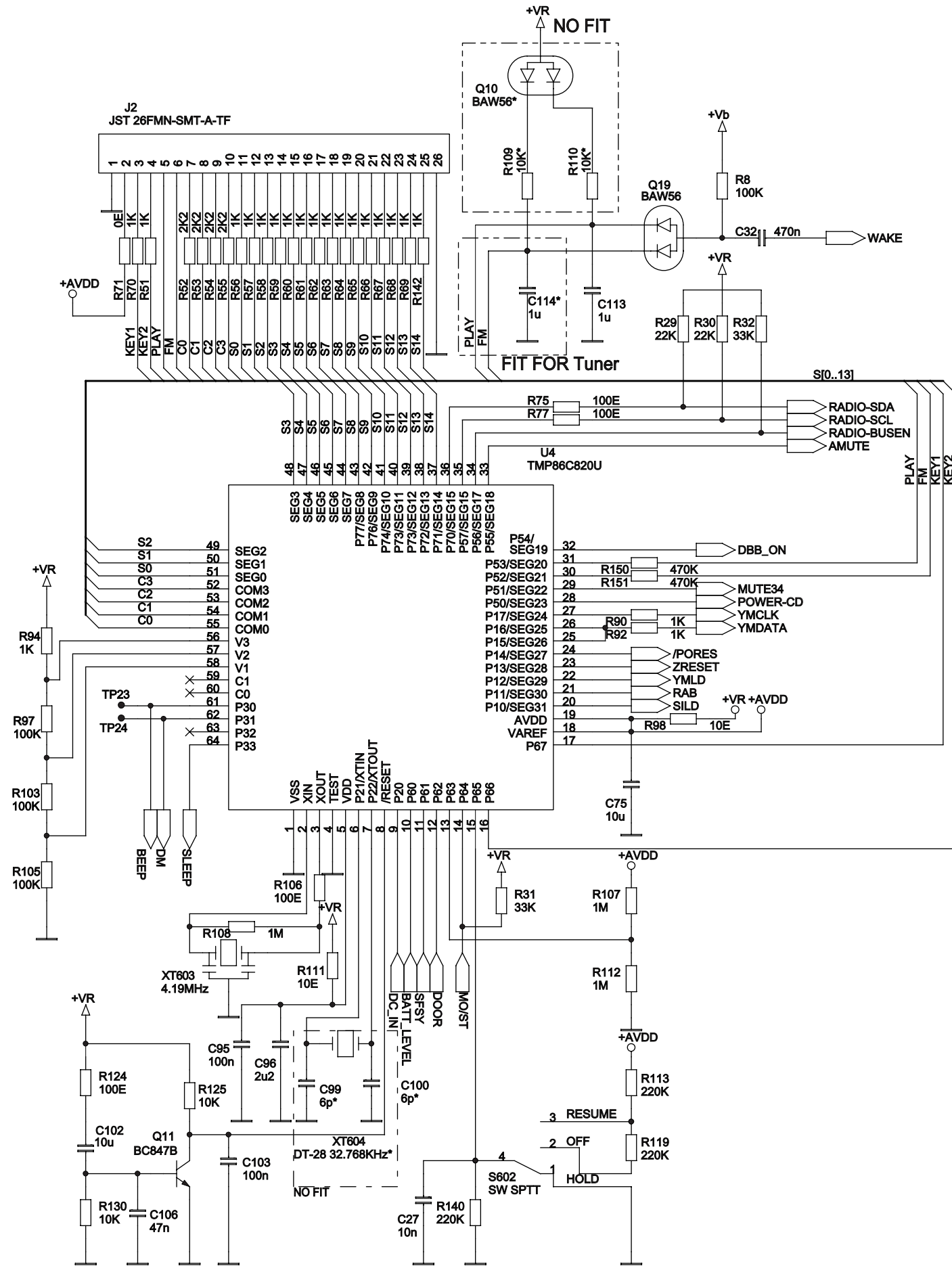


IC BLOCK DIAGRAM

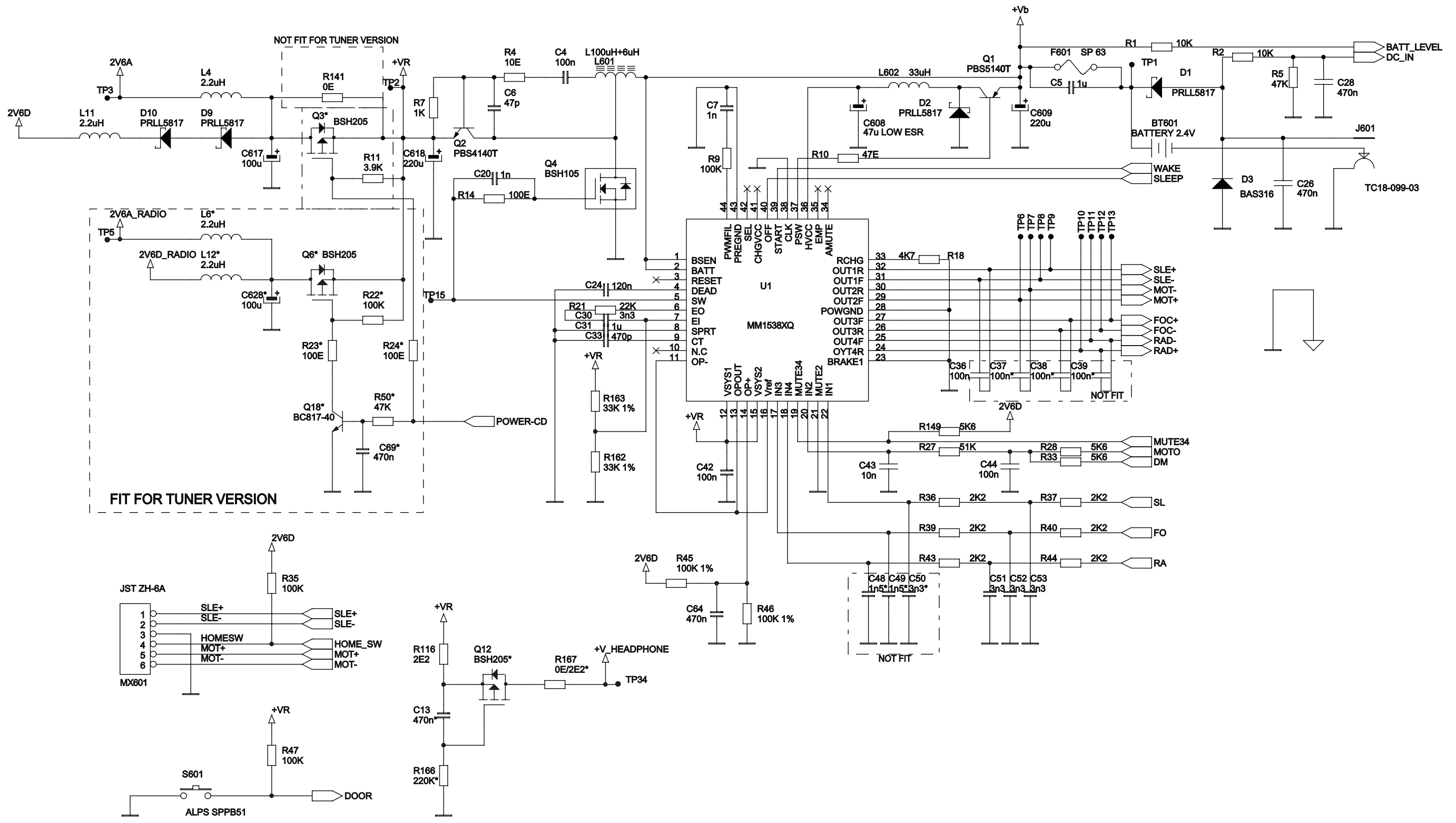
U6: SM5907AF



# CIRCUIT DIAGRAM - CONTROL PART

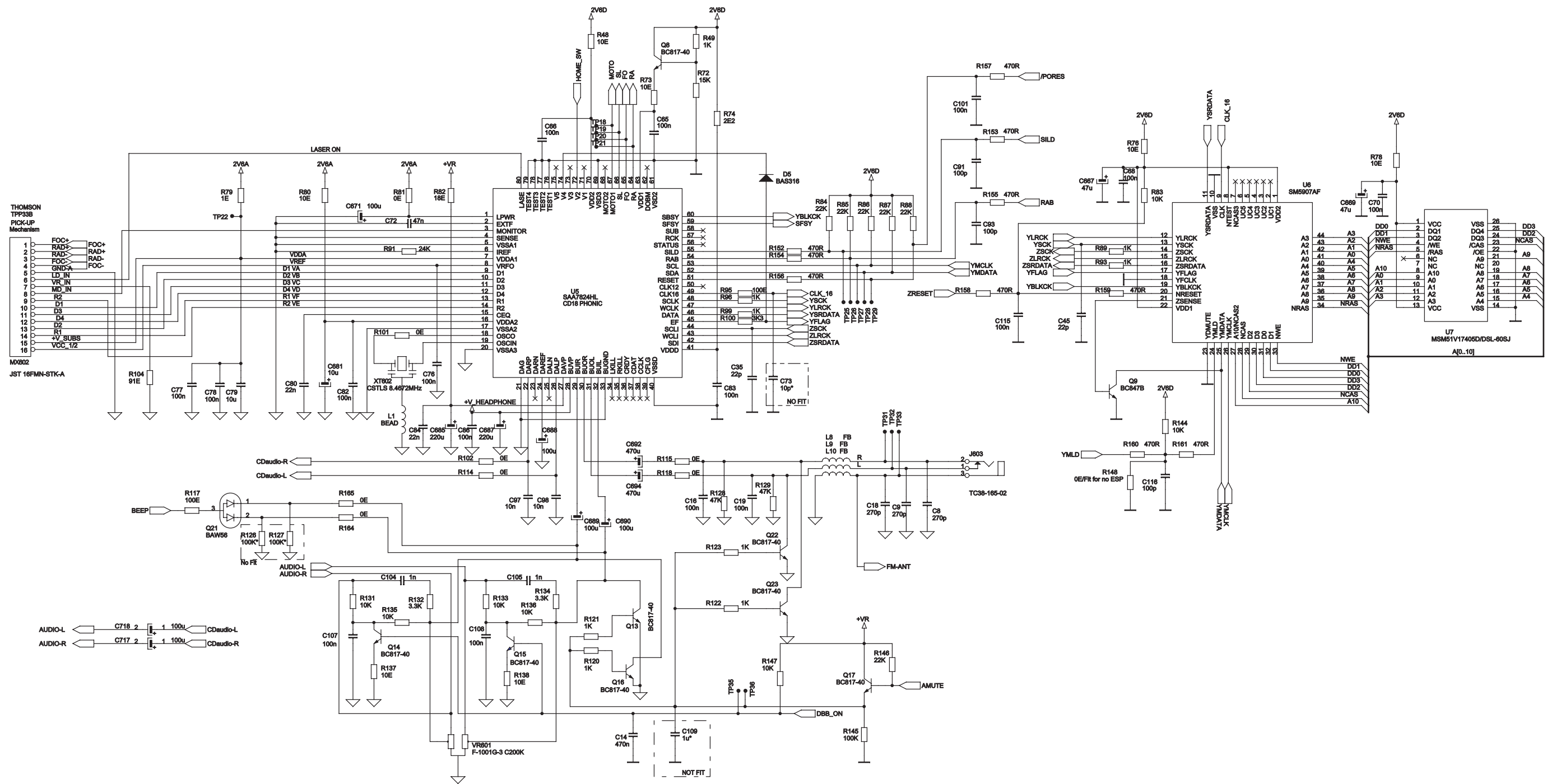


# CIRCUIT DIAGRAM - SUPPLY AND SERVO PART

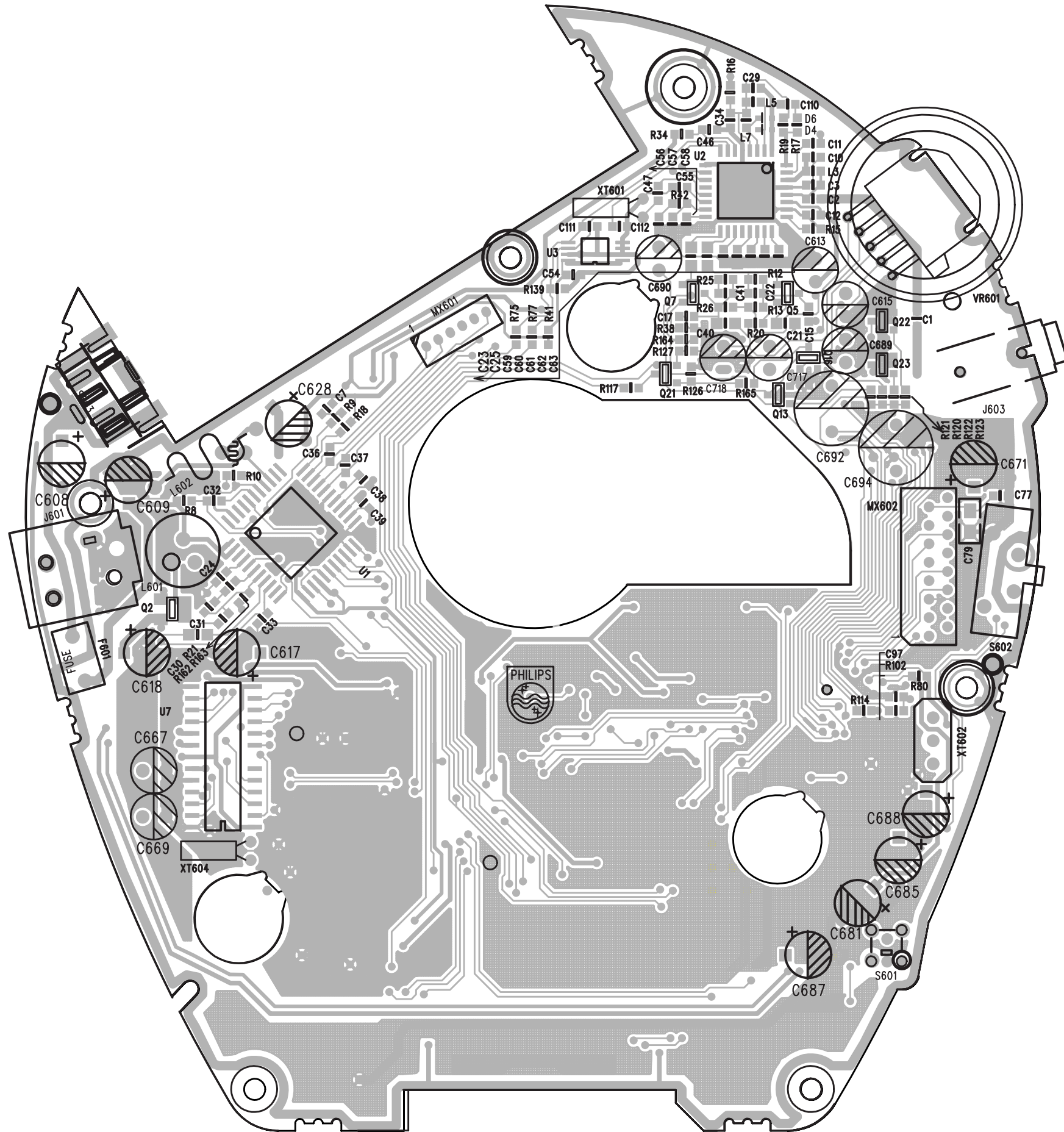




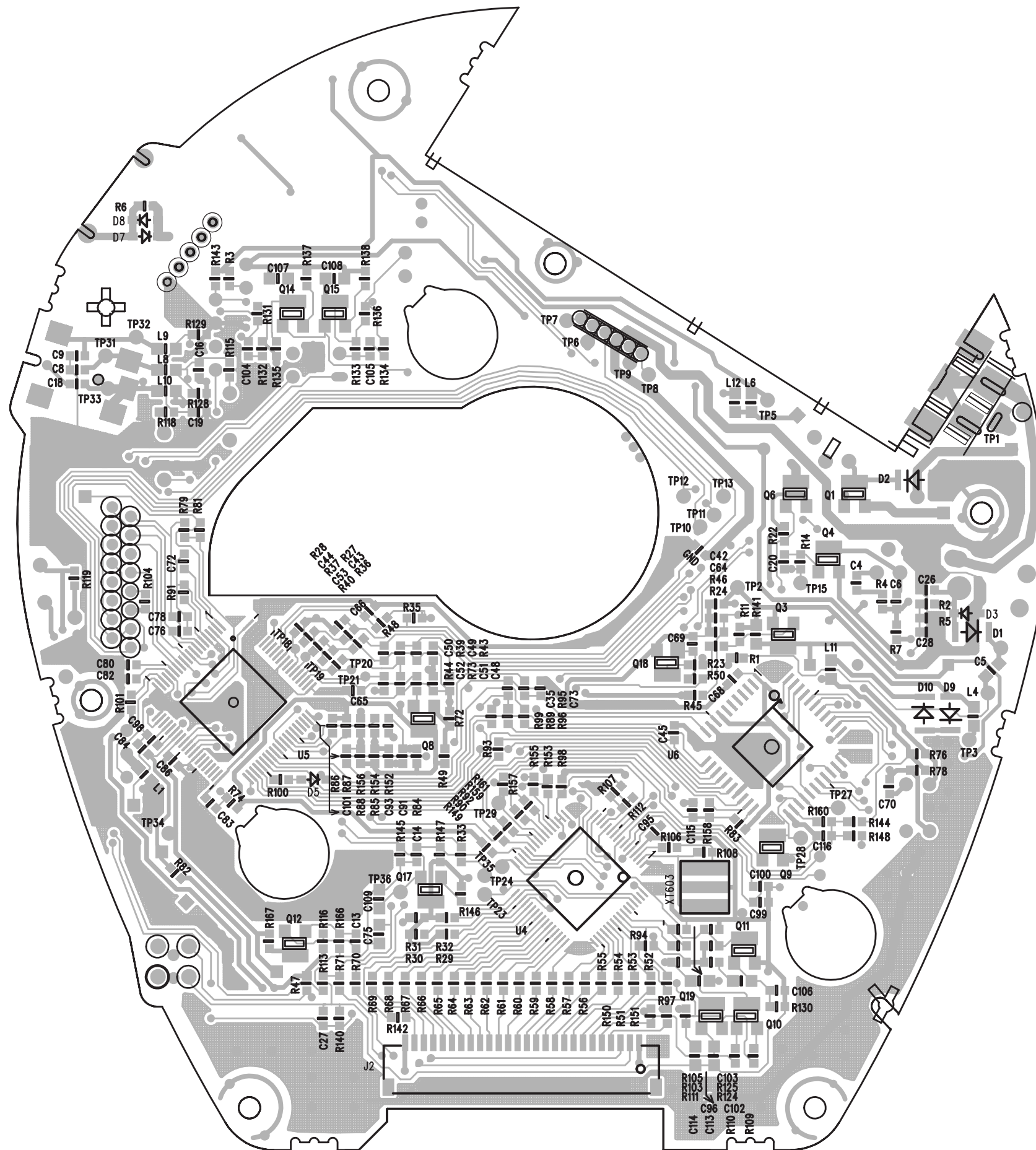
# CIRCUIT DIAGRAM - CD AND AUDIO PART



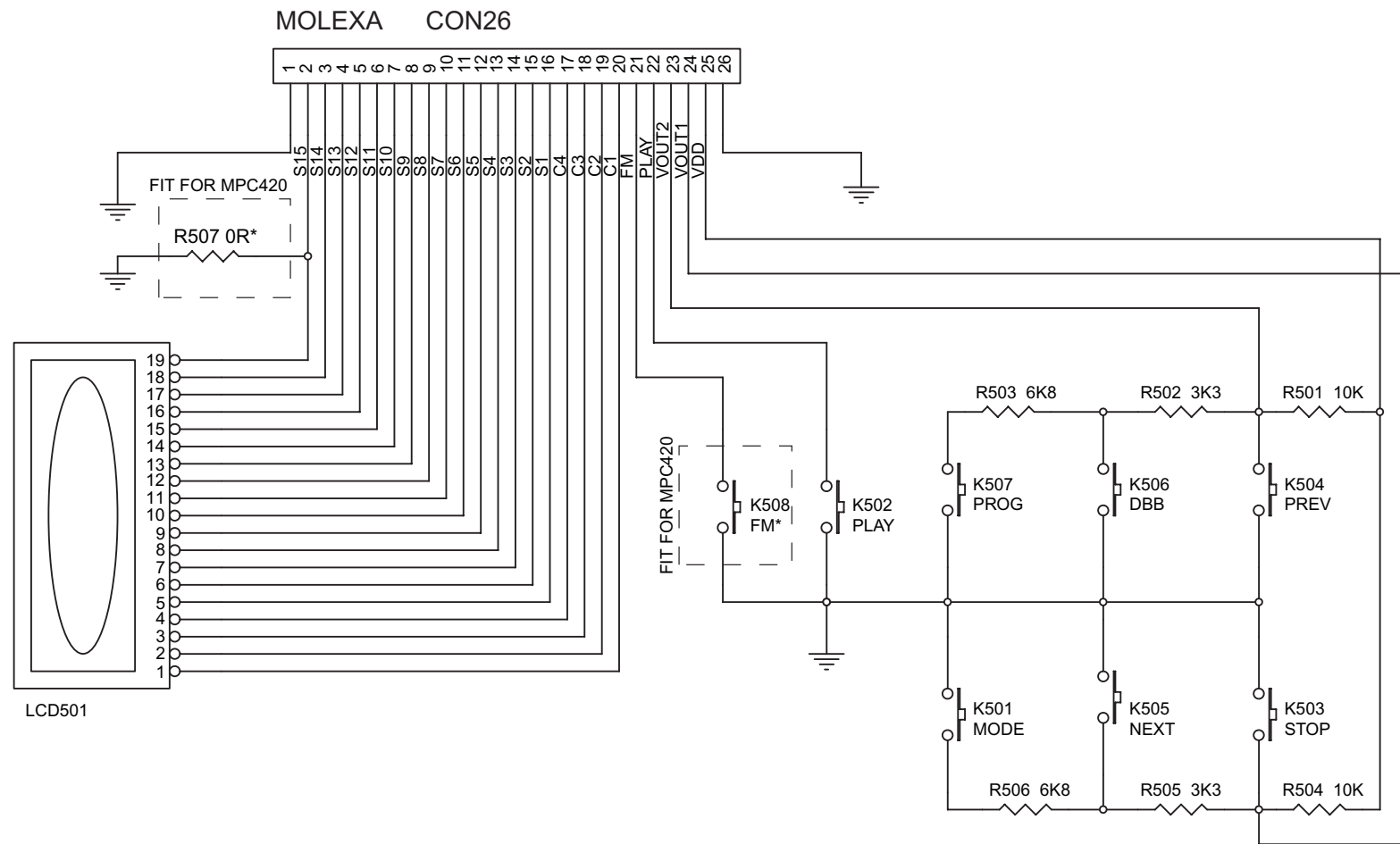
LAYOUT DIAGRAM - component side



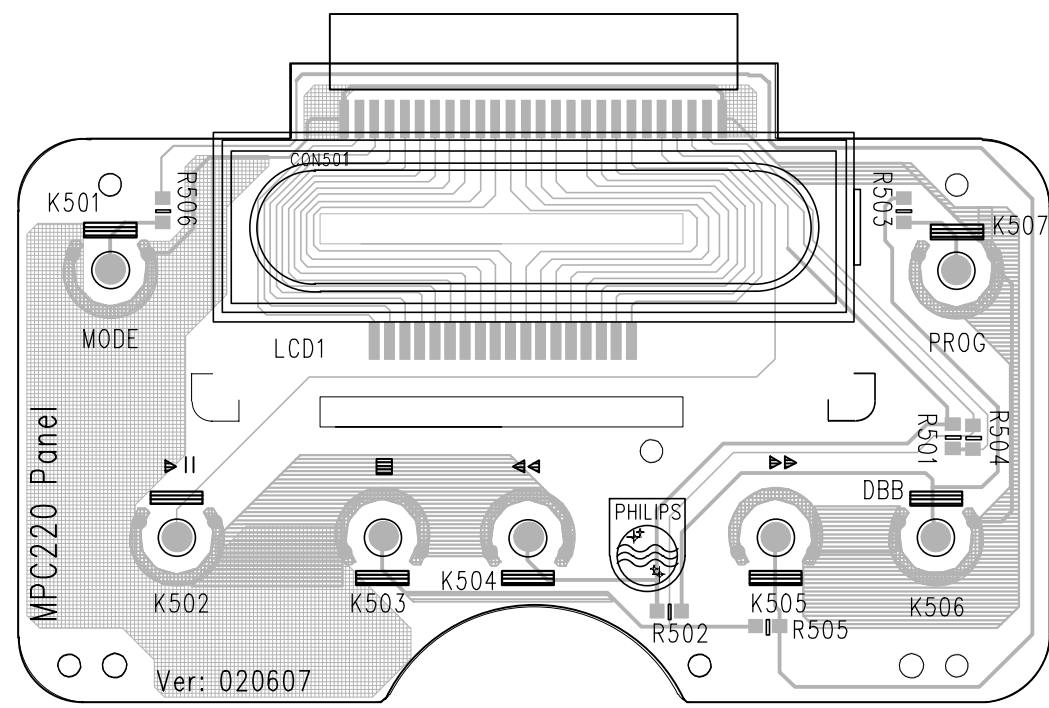
LAYOUT DIAGRAM - copper side



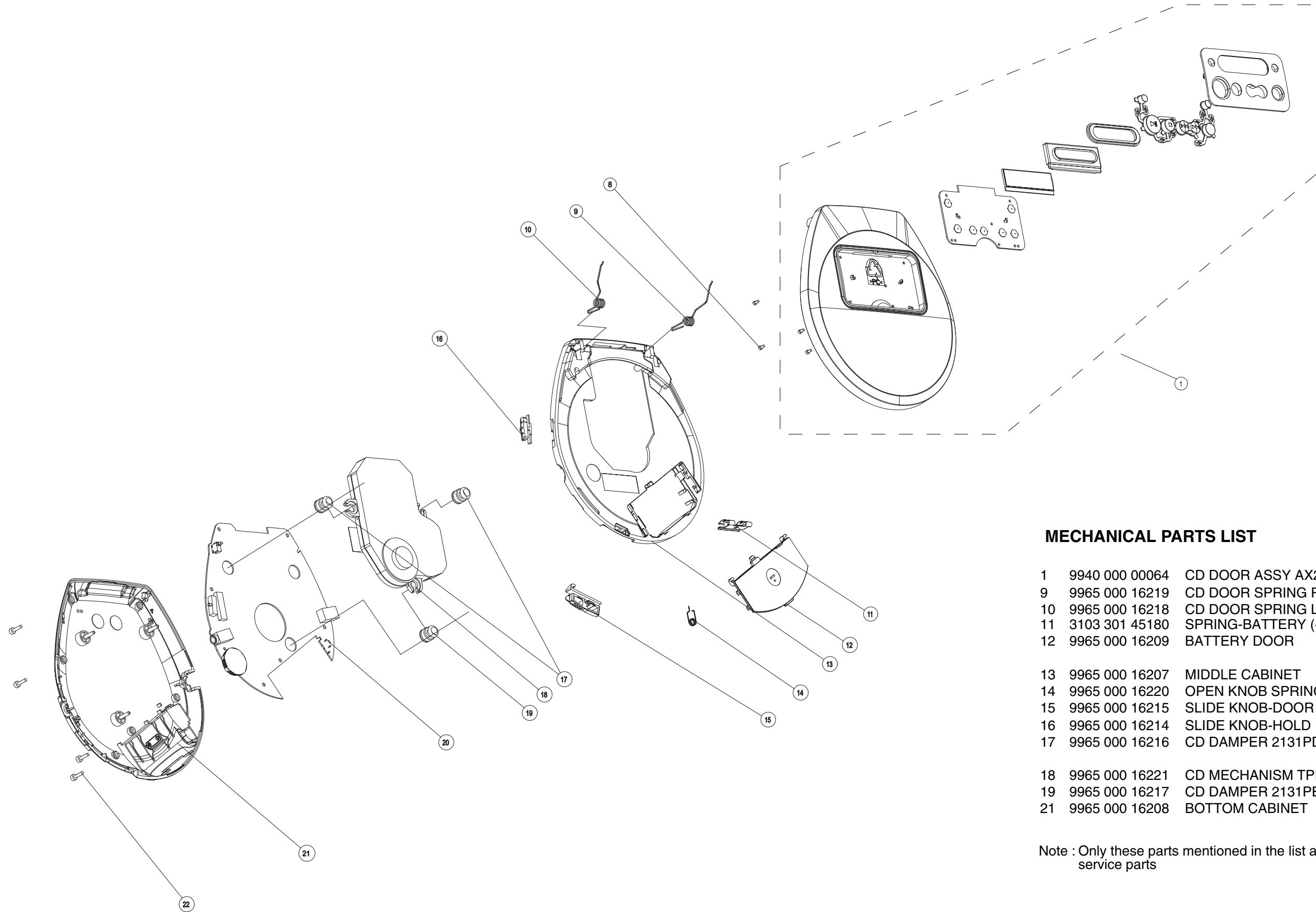
### CIRCUIT DIAGRAM - KEY BOARD



### LAYOUT DIAGRAM - KEY BOARD



## EXPLODED VIEW DIAGRAM



## MECHANICAL PARTS LIST

1	9940 000 00064	CD DOOR ASSY AX23xx
9	9965 000 16219	CD DOOR SPRING RIGHT
10	9965 000 16218	CD DOOR SPRING LEFT
11	3103 301 45180	SPRING-BATTERY (+/-)
12	9965 000 16209	BATTERY DOOR
13	9965 000 16207	MIDDLE CABINET
14	9965 000 16220	OPEN KNOB SPRING
15	9965 000 16215	SLIDE KNOB-DOOR OPEN
16	9965 000 16214	SLIDE KNOB-HOLD
17	9965 000 16216	CD DAMPER 2131PD YELLOW
18	9965 000 16221	CD MECHANISM TPP33BCP
19	9965 000 16217	CD DAMPER 2131PE WHITE
21	9965 000 16208	BOTTOM CABINET

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



**ELECTRICAL PARTSLIST****MISCELLANEOUS**

CON626	9965 000 16222	FFC 26P 61MM
F601	9965 000 16223	FUSE 0.63A
J601	9965 000 11404	DC JACK TC18-099-03
J603	9965 000 16224	3.5MM STEREO JACK
LCD501	9965 000 16225	LCD DISPLAY 92424TR-H
S601	9965 000 16226	CD DOOR SWITCH DTS-03
S602	9965 000 16227	SLIDE SWITCH 1P3T

**RESISTORS**

VR601	9965 000 16228	VOLUME B200K
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**COILS & FILTERS**

L4	9965 000 16229	INDUCTOR 2.2UH
L8	9965 000 16230	FERRITE BEAD
L9	9965 000 16230	FERRITE BEAD
L10	9965 000 16230	FERRITE BEAD
L11	9965 000 16229	INDUCTOR 2.2UH
L601	9965 000 16231	DC-DC OSC COIL
L602	9965 000 16232	FXD INDUCTOR 33UH
XT602	9965 000 16233	CERAMIC RES. 8.467MHZ
XT603	9965 000 16234	CERAMIC RES. 4.19 MHZ

**DIODES**

D1	4822 130 83918	PRL5817
D2	4822 130 83918	PRL5817
D3	4822 130 11397	BAS316
D5	4822 130 11397	BAS316
D9	4822 130 83918	PRL5817
D10	4822 130 83918	PRL5817

**TRANSISTORS AND IC**

Q1	9965 000 16235	PBSS5140T
Q2	9965 000 16236	PBSS4140T
Q4	9965 000 16237	FET BSH103
Q8	4822 130 42615	BC817-40
Q9	5322 130 42755	BC847C
Q11	5322 130 42755	BC847C
Q13	4822 130 42615	BC817-40
Q14	4822 130 42615	BC817-40
Q15	4822 130 42615	BC817-40
Q16	4822 130 42615	BC817-40
Q17	4822 130 42615	BC817-40
Q19	5322 130 30691	BAW56
Q21	5322 130 30691	BAW56
Q22	4822 130 42615	BC817-40
Q23	4822 130 42615	BC817-40
U1	9965 000 16238	MM1538XQ
U4	9965 000 16239	TMP86CH21U-MPC220
U5	9965 000 16240	SAA7824HL/M0D
U6	9322 169 78671	SM5907AF (NIPR) Y
U7	9322 175 89668	MSM51V17405F-60SJ

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