

Portable compact disc player

Service
Service
Service



AZ7381 AZ7386
AZ7382 AZ7387
AZ7383 AZ7481
AZ7384 AZ7482
AZ7385 AZ7483
all versions

MABEL PLATFORM 3A/4A – PB2
THIS MANUAL IS VALID FROM FACTORY CHANGE CODE KT02 ONWARDS

Service Manual



TABLE OF CONTENTS

Technical specification	1-1
Connections and controls	1-2
Feature overview	1-2
Accessories	1-3
Safety warnings	1-4

Service hints

Repair positions	2-1
Service tools	2-1
Training material	2-1
ESD protection equipment	2-1
Handling chip components	2-2

Service test program	3-1...3-2
Blockdiagram	3-3
Start-up procedure	3-4
Pinning of ICs	3-5...3-9

Circuit diagrams

Supply/Servodriver part	4-1
Signal processing part	4-2
Membrane assembly 4822 360 10363	4-3
Control part	4-4
Audio part	4-5

Printed circuit board

Copperside view	4-6
Componentside view	4-7

Exploded view	5-1...5-2
Mechanical partslist	6-1
Electrical partslist	6-1...6-3

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Published by PW 9813 Service Audio Printed in The Netherlands Subject to modification

**CLASS 1
LASER PRODUCT**

GB 4822 725 26021



TECHNICAL SPECIFICATION

General

Dimensions (WxHxD)	: 128x28x136.5mm
Weight without batteries	: 225g

Power supply modes

DC-in socket	: 4.5-5.5V
Primary batteries (2xLR6)	: 1.55-3.6V
Rechargeable batteries	: 1.55-3.6V

Battery lifetime

BATTERY TYPE	ESA OFF	PSM ON	ESA ON
Primary batteries (2xLR6)	12hrs typ.	–	12hrs typ.
Accu-pack AY3361 (NiCd, 700mAh)	4hrs typ.	–	4hrs typ.

Battery empty detection

Battery weak level	: 2.1V nom. ± 150 mV
Battery empty level	: 1.6V nom. ± 100 /-50mV

Charge circuit

Charge current	: 200mA nom. $\pm 20\%$
Charge time for 80% AY3361	: 4.0hrs nom.
Max. charge time (μ P controlled)	: 5.0hrs nom.
Temperature protection	: none

Current consumption (DC-in=4.5V, excl. illumination)

OPERATION	ESA OFF	PSM ON	ESA ON
Play-mode	145mA typ.	–	165mA typ.
Jump-mode	450mA typ.	–	450mA typ.
Stand-by (excl. recharge)	15mA typ.		

Current consumption (Batt. supply=2.25V, excl. illumin.)

OPERATION	ESA OFF	PSM ON	ESA ON
Play-mode	165mA typ.	–	165mA typ.
Jump-mode	450mA typ.	–	450mA typ.
Stand-by (excl. recharge)	0.4mA typ.		

Shock resistance (ESA off)

+X/-X direction	: ≥ 2.5 g
+Y/-Y direction	: ≥ 2.5 g
+Z/-Z direction	: ≥ 2.0 g

Shock resistance by use of car base (ESA off)

+X/-X direction	: ≥ 6 g
+Y/-Y direction	: ≥ 6 g
+Z/-Z direction	: ≥ 6 g

Headphone out (measured with 16 Ω load, ESA & DBB off)

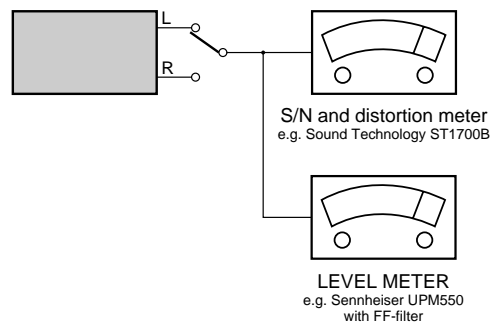
Output power (THD=10%)	: 2x12mW (+1/-3dB)
Frequency response (1mW)	: 100Hz-20kHz within 6dB
S/N ratio (unwght)	: > 80 dB (83dB typ.)
S/N ratio (A-wght)	: > 82 dB (85dB typ.)
THD+N (1kHz, 1mW)	: $< 1\%$ (0.2% typ.)
Channel crosstalk (1kHz, no load)	: < -24 dB (-44 dB typ.)
Channel unbalance (-40 dB)	: < 5 dB
Volume attenuation (1kHz)	: > 60 dB

Laser

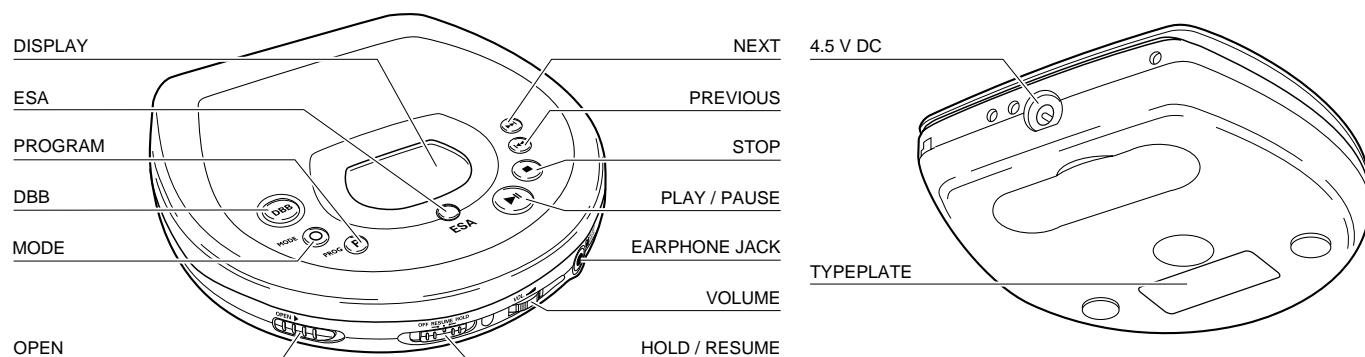
Output power	: < 5 mW (3mW typ.)
Wavelength	: 780nm

Measurement setup

Use Audio Signal disc SBC429 4822 397 30184



CONNECTIONS AND CONTROLS



DISPLAYshows the different playing modes, tracks and times

►►skips and searches forward

◄◄skips and searches backward

VOLUMEadjusts the volume level at the headphone socket

RESUME/HOLDactivates the RESUME function and/or HOLD function (locking all buttons)

MODE ○selects the different playing modes: SHUFFLE→SHUFFLE REPEAT ALL→REPEAT→REPEAT
ALL→SCAN→off

PROG Pstores tracks in a program and reviews the program

DBBDynamic Bass Boost: enhances the bass response,
DBB 1→DBB 2→DBB 3→off

Press this button for more than 3 seconds to switch off/on acoustic feedback.

STOP ■stops CD play, deletes various settings, switches off the CD player and activates charging.

OPENopens the lid of the CD player

►||starts and pauses CD play

ESAElectronic Shock Absorption is the buffer memory for uninterrupted sound

EARPHONEEarphone socket (3.5mm)

4.5 V DCSocket for external power supply

Battery compartment to insert batteries

FEATURE OVERVIEW

FEATURES OF CD-PORTABLE FAMILY MABEL 3A, 4A	PLATFORM 3A							PLATFORM 4A		
	AZ7381	AZ7382	AZ7383	AZ7384	AZ7385	AZ7386	AZ7387	AZ7481	AZ7482	AZ7483
ELECTRONIC SHOCK ABSORPTION (ESA)	12sec.	12sec.	12sec.	12sec.	12sec.	12sec.	12sec.	25sec.	25sec.	25sec.
POWER SAVE MODE (PSM)	—	—	—	—	—	—	—	—	—	—
HOLD / RESUME FUNCTION	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●
DBB STAGES	3	3	3	3	3	3	3	3	3	3
ACOUSTIC FEEDBACK	●	●	●	●	●	●	●	●	●	●
PROGRAM MEMORY	99	99	99	99	99	99	99	99	99	99
RECHARGE FUNCTION NiCd / NiMH	● / —	● / —	● / —	● / —	● / —	● / —	● / —	● / —	● / —	● / —
EXTERNAL BATTERY BOX PREPARED	—	—	—	—	—	—	—	—	—	—
LCD ILLUMINATION	—	—	—	—	—	—	—	—	—	—
CORD REMOTE CONTROL PREPARED	—	—	—	—	—	—	—	—	—	—
LINE / DIGITAL OUTPUT	— / —	— / —	— / —	— / —	— / —	— / —	— / —	— / —	— / —	— / —

ACCESSORIES FOR CD-PORTABLE FAMILY MABEL 3A, 4A		AZ7381				AZ7382				AZ7383				AZ7384	AZ7385	AZ7386	AZ7387	AZ7481			AZ7482			AZ7483		
		/00	/01	/14	/17	/00	/05	/11	/14	/01	/05	/11	/17	/17	/17	/17	/17	/00	/05	/14	/00	/05	/14	/00	/10	/17
AY3160/00A AC/DC ADAPTOR	4822 219 10257	X				X												X			X			X		
AY3160/02 AC/DC ADAPTOR	4822 219 10449		X						X																	
AY3160/05A AC/DC ADAPTOR	4822 219 10267						X				X								X							
AY3160/10A AC/DC ADAPTOR	4822 219 10346																								X	
AY3160/12A AC/DC ADAPTOR	4822 219 10428			X				X	X			X										X				
AY3160/37A AC/DC ADAPTOR	4822 219 10182				X								X	X			X									X
AY3263/00 POUCH	4822 600 10765	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	X	O	O	O	O
AY3361/00 BATTERY PACK NiCd	4822 138 10615	O	O	O	O	X	X	X	X	X	X	O	O	O	O	O	O	O	O	O	X	X				O
AY3501/00 CAR ADAPTOR CASSETTE	4822 397 10059	O	O	O		O	O	O	O	X	X							O	O	O	O	O	O	O	O	O
AY3501/37 CAR ADAPTOR CASSETTE	4822 397 10098				O							X	X													O
AY3545/00 CAR DC/DC CONVERTER	4822 219 10033	O	O	O		O	O	O	O	X	X							O	O	O	O	O	O	O	O	O
AY3545/37 CAR DC/DC CONVERTER	4822 219 10183				O							X	X					X								O
AY3674/00 EARPHONE	4822 242 10842	X	X	X		X	X		X	X	X							X	X	X			X	X	X	X
AY3674/00V EARPHONE	4822 242 10854							X													X	X				
AY3682/37 HEADPHONE	4822 242 10844				X							X	X					X								X
AY3860/00 ACTIVE SPEAKER BOX	4822 445 10513	O	O	O		O	O	O	O	O	O							O	O	O	O	O	O	O	O	O
AY3860/17 ACTIVE SPEAKER BOX	4822 445 10514				O							O	O													O
AY3464 HIFI CORD (3.5mm → cinch, L-plug)	4822 320 11881	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X	X	X	X	X	X	O	O	O

X.....supplied with the set, O.....optional available

SAFETY WARNINGS

Ⓖ⒃ 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.

ⒻⒻ ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD). Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.

Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfilez le bracelet serti d'une résistance de sécurité.

Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

ⒻⒹ WARNING

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.

ESD



ⒼⒶ 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 hetzelfde potentiaal.

ⒻⒶ AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).

La loro longevità potrebbe essere fortemente ridotta in caso di non osservazione della più grande cauzione alla loro manipolazione. Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.

Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

Ⓖ⒃ 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

Ⓖ⒃

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 ▲

ⒻⒻ

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



ⒻⒹ

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.

ⒼⒶ

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 ▲

ⒻⒶ

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 ▲

Ⓖ⒃

DANGER: Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.

**CLASS 1
LASER PRODUCT**

ⒶⒻ Varning !

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

ⒻⒹ Advarsel !

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

ⒻⒶ Varoitus !

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

Ⓖ⒃

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.

ⒻⒻ

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

SERVICE HINTS

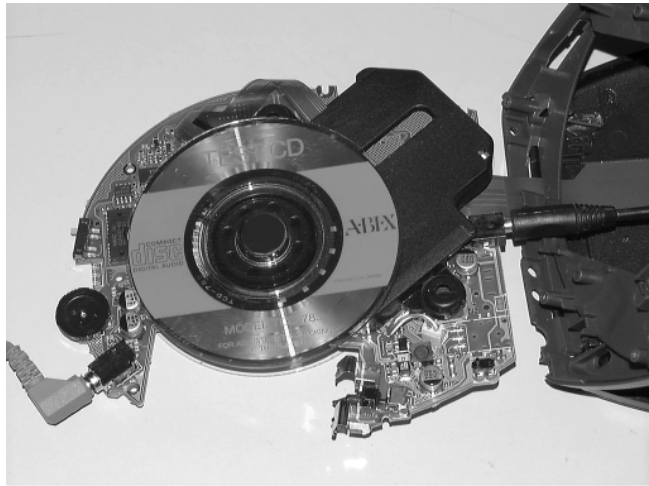
REPAIR POSITION COPPERSIDE



To get access to the copperside of the printed circuit board proceed as follows:

1. Remove the bottom screws (6x)
2. Lift the bottom-cabinet
3. Supply the unit via external DC-socket
4. Take care of door switch during measurement or enter service test program, radial test

REPAIR POSITION COMPONENTSIDE



To get access to the componentside of the printed circuit board proceed as follows:

1. Remove the bottom screws (6x)
2. Open the CD-door
3. Lift the top-cabinet and put it backwards on the table
4. Remove the bottom and supply the unit via the external DC-socket as shown in the picture above
5. Close the door-switch (i.e. adhesive tape) or enter service test program, radial test

The unit is now in a proper working position and can be turned in all directions necessary to get access for measurements.

SERVICE TOOLS

Audio signal disc **SBC429**

Playability test disc **SBC444**

Test disc 5 (disc without errors) + Test disc 5A (disc with dropout errors, black spots and fingerprints) **SBC426/SBC426A**

4822 397 30184

4822 397 30245

4822 397 30096

TRAINING MATERIAL

Portable CD 1994 – Principles of Electronic Shock Absorption System ESA,
Key components 1994, Remote control system

4822 725 24941

Portable CD 1996 – Key components 1996, Battery charging, DC/DC-converter

4822 725 24986

Portable CD 1998 – Key components 1998, Power Save Mode PSM
(available from April 1998 onwards)

4822 725 26017

ESD PROTECTION EQUIPMENT

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4822 320 11308

KIT ESD3 (combining all 6 prior products - small table mat)

4822 310 10671

Wristband tester

4822 344 13999

HANDLING CHIP COMPONENTS

GENERAL

Diagram illustrating the general assembly of a chip component onto a P.C.B. The component is shown being soldered onto the copper track. Labels include: SOLDER, CHIP COMPONENT, SOLDER, COPPER TRACK, P.C.B., and GLUE.

Diagram illustrating a service package containing multiple chip components.

SERVICE PACKAGE

DISMOUNTING

Diagram illustrating the dismounting process. It shows the use of a vacuum piston (e.g., 4822 395 10082) and a soldering iron (e.g., Weller solder tip PT-H7) to remove the component. The process is labeled A.

Diagram illustrating the dismounting process using a solder wick (e.g., 4822 321 40042) and a soldering iron. The process is labeled B.

Diagram illustrating the dismounting process using a pair of tweezers and heating. The process is labeled B.

Diagram illustrating the dismounting process using a soldering iron and solder wick for cleaning. The process is labeled C.

PRECAUTIONS

Diagram illustrating correct soldering technique. The label "CORRECT" is shown next to a diagram of a soldering iron being used on a copper track.

Diagram illustrating incorrect soldering technique. The label "CORRECT" is shown next to a diagram of a soldering iron being used on a chip component.

Diagram illustrating incorrect soldering technique. The label "CORRECT" is shown next to a diagram of a soldering iron being used on a chip component.

Diagram illustrating incorrect soldering technique. The label "CORRECT" is shown next to a diagram of a soldering iron being used on a chip component.

MOUNTING

Diagram illustrating the mounting process. It shows the use of a pair of tweezers (e.g., A PAIR OF TWEEZERS) and solder (e.g., SOLDER $\phi 0.5-0.8\text{mm}$) to place the component. The process is labeled A.

Diagram illustrating the mounting process using a soldering iron and pressure. The process is labeled B.

Diagram illustrating the mounting process using a soldering iron and pressure. The process is labeled B.

EXAMPLES

Diagram illustrating examples of correct and incorrect mounting. The label "CORRECT" is shown next to a diagram of a component being mounted correctly. The label "NOT" is shown next to a diagram of a component being mounted incorrectly.

SERVICE TEST PROGRAM

1. PRELIMINARY SETUP

- To enter the service test program hold the keys "MODE" and "STOP" depressed while turning POWER ON (i.e. connecting the AC/DC adaptor or inserting batteries).
- The display shows the software version of the built-in microprocessor (i.e. "5 - 19"). Versions are counted from "00" onwards; that means the higher the number the newer the software.
- The program is now in the main menu – various tests can be entered by pressing the corresponding buttons (see flow chart on next page or detailed description of test programs below).
- To exit the service test program disconnect the set from the power source.

2. DISPLAY TEST

Purpose: Check functionality of display and display driver.

- To enter the display test start service test program and press the "NEXT" button.
- The display shows test pattern1. All segments are activated for finding open circuits (see flow chart on next page).
- To jump to the next pattern press the "NEXT" button.
- The display shows test pattern2. All alternate pins (2, 4, ...) are activated for finding short circuits (see flow chart on next page).
- To jump back to test pattern1 press the "NEXT" button, to exit the display test and return to the main menu press the "STOP" button.

3. KEY TEST

Purpose: Check operation of keys.

- To enter the key test start service test program and press the "MODE" button.
- The display shows "- -".
- Hold key depressed and check corresponding key code on the display. Key codes can be found in table1 (see flow chart on next page).
- To exit the key test and return to the main menu press the "STOP" button.

4. PLAYBACK TEST WITH ERROR ANALYSIS

Purpose: Analyse errors that occur during playback and search for intermittent failures.

- To enter the playback test start service test program and press the "DBB" button. Note that the playback test can only be entered if the CD-door is closed.
- The set now reads the TOC and switches to stand-by.
- Press the "PLAY" button to start the error analysis.

As long as the playback is free of errors the display shows track and time information like in normal play-mode.

In case of an error a corresponding error code will be displayed. The meaning of this error code can be found in table2 (see flow chart on next page).

Note: Errors can either be "fatal" or "non fatal". Fatal errors always stop the playback, non fatal errors only cause a short interruption of the music. Fatal errors are displayed as long as the set is connected to the power source, non fatal errors are displayed until a new error occurs or a button is pressed.

- To stop the playback test disconnect the set from the power source.

5. SERVO TEST

Purpose: Check door switch and inner switch, movement of slide and acceleration of discmotor.

- To enter the servo test start service test program and press the "PLAY" button.
- The display shows "5 xy".
- "x" indicates state of door switch;
- "y" indicates state of inner switch.
- x,y = "0" means switch is closed; "1" means switch is open.

- To move slide outside hold the "NEXT" button depressed.
- To move slide inside hold the "PREV" button depressed.

- To accelerate the discmotor clockwise hold the "MODE" button depressed.
- To accelerate the discmotor counter-clockwise hold the "PROG" button depressed.
- To enter the focus test press the "PLAY" button, to exit the servo test and return to the main menu press the "STOP" button.

6. FOCUS TEST

Purpose: Check movement of lens and operation of focus servo.

- The focus servo loop is switched on and the set starts searching the focus ("focus ramping"). As soon as the focus has been found the focus servo loop is closed and the state of the focus is monitored continuously.
- If the focus is OK the display shows " F", else "- F".
- When the disc is turned manually "focus noise" is audible.
- To move slide outside hold the "NEXT" button depressed.
- To move slide inside hold the "PREV" button depressed.
- To accelerate the discmotor clockwise hold the "MODE" button depressed.
- To accelerate the discmotor counter-clockwise hold the "PROG" button depressed.
- In case the focus is OK the discmotor test can be entered by pressing the "PLAY" button, to exit the focus test and return to the main menu press the "STOP" button.

7. DISCMOTOR TEST

Purpose: Check speed regulation of discmotor.

- The speed regulation is switched on and the discmotor starts rotating. If the speed reaches 75% of the nom. speed the display shows " d", else "- d".
- In parallel also the state of the focus is monitored continuously (display " F" or "- F").
- In case the disc speed is OK and the focus is OK the radial test can be entered by pressing the "PLAY" button, to exit the discmotor test and return to the main menu press the "STOP" button.

8. RADIAL TEST

Purpose: Check if radial loop locks and an audio signal is audible at the headphone output.

- The radial servo loop is switched on, mute is released and the audio signal is audible. If the system is on track the display shows " r", else "- r".
- In parallel also the disc speed (display " d" or "- d") and the state of the focus (display " F" or "- F") are monitored continuously.

Note: In case of radial errors the audio output is muted and muting is not released automatically when the systems recovers from the error. "- r" remains on the display.

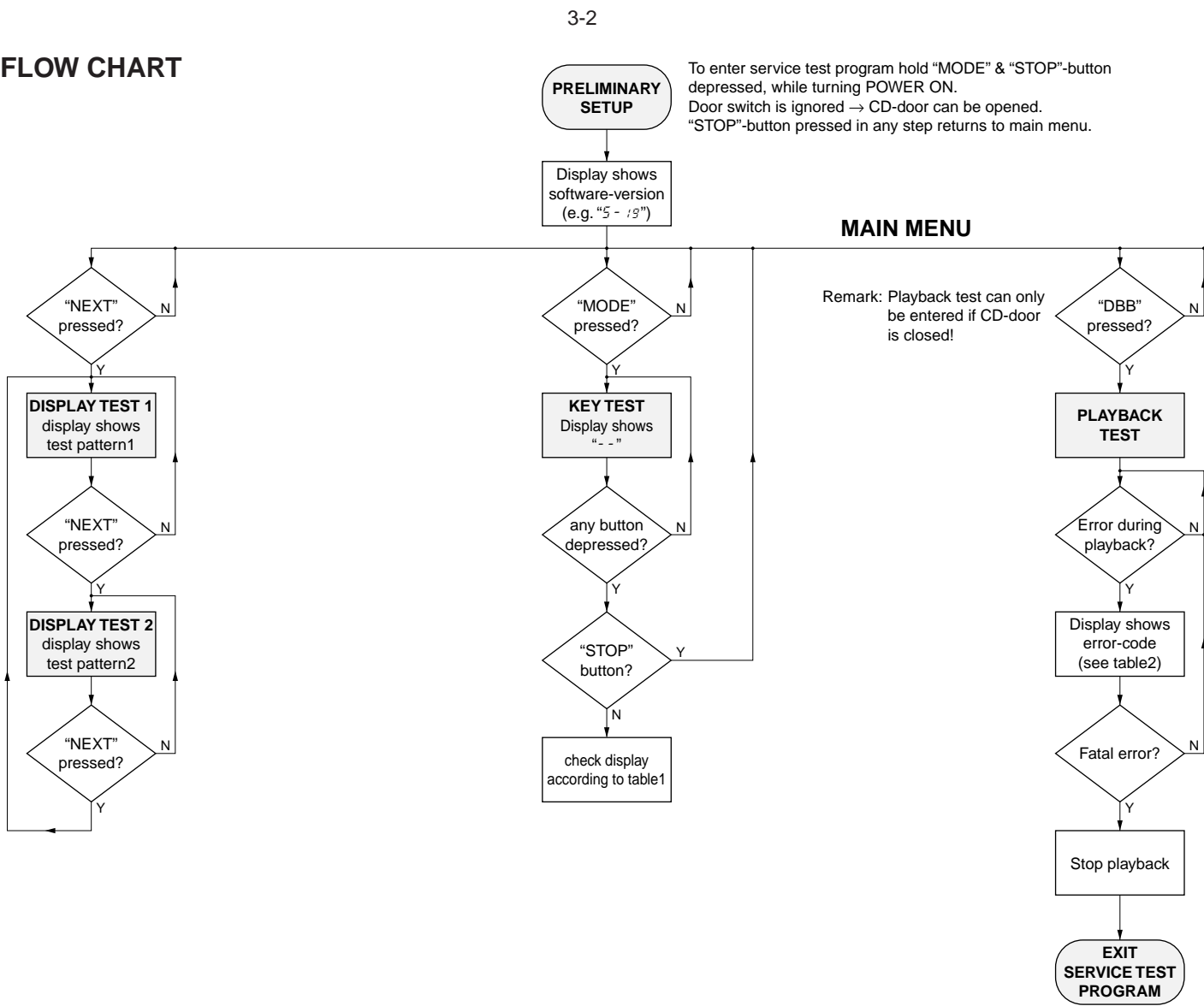
- To open mute again press the "NEXT" or "PREV" button.
- To jump 10 tracks outside press the "NEXT" button.
- To jump 10 tracks inside press the "PREV" button.
- To exit the radial test and return to the main menu press the "STOP" button, to exit the service test program disconnect the set from the power source.

Important remark:

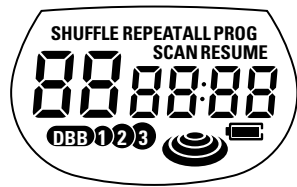
In radial test mode data to the DRAM is written at 1.2 times the nominal speed, and read from the DRAM at nominal speed. Because writing is done faster than reading the DRAM gets full after a certain time.

In normal play mode the system would now wait until the DRAM is partly emptied again, jump backwards and resume filling at the last written position. However, in radial test mode the jumps would disturb measurements on the radial servo loop. Therefore this function has been disabled and filling restarts immediately from the current position of the pick-up unit. As a result "jumps" are audible during playback.

FLOW CHART



test pattern1



test pattern2

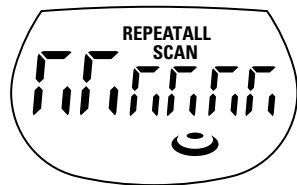


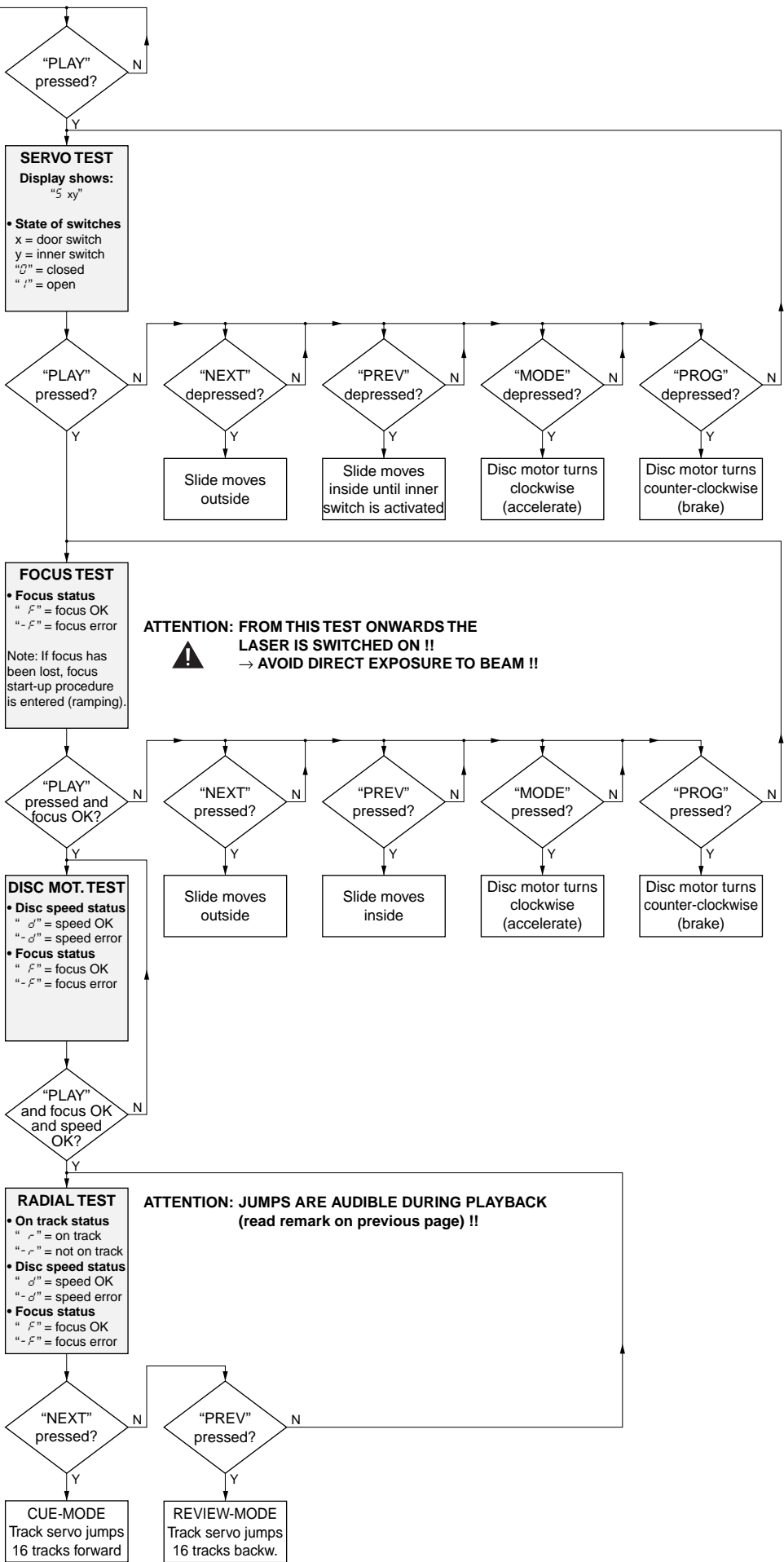
table1 – key test

KEYS OF SET	DISPLAY OF SET
PLAY	3
NEXT	5
PREVIOUS	6
ESA/ESP	2
MODE	7
PROGRAM	8
DBB	!

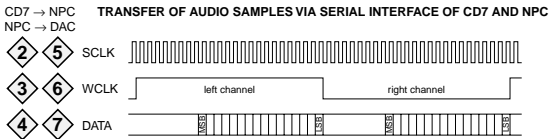
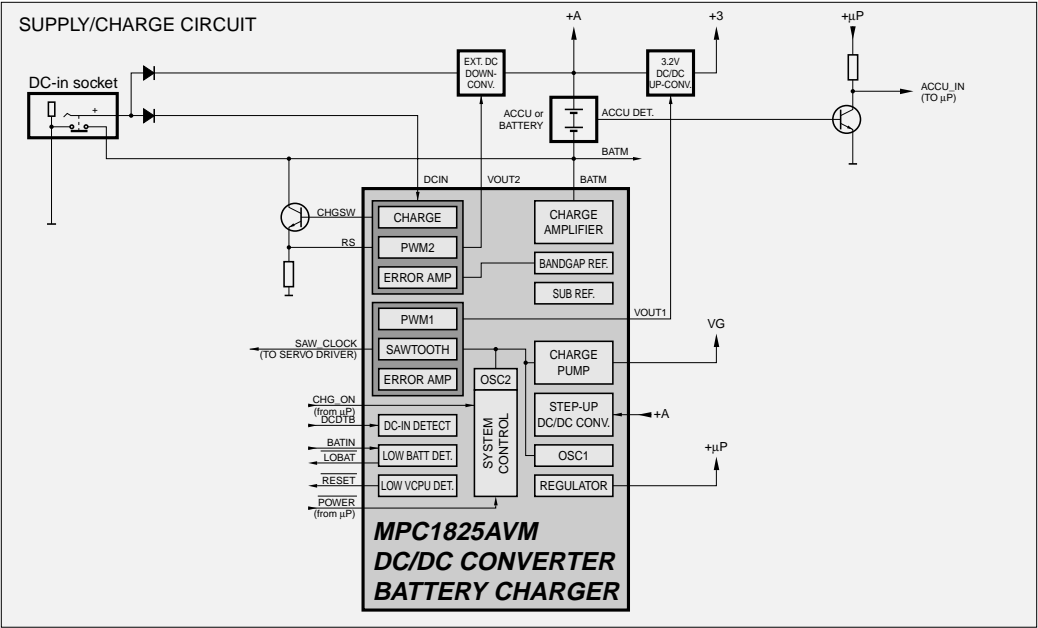
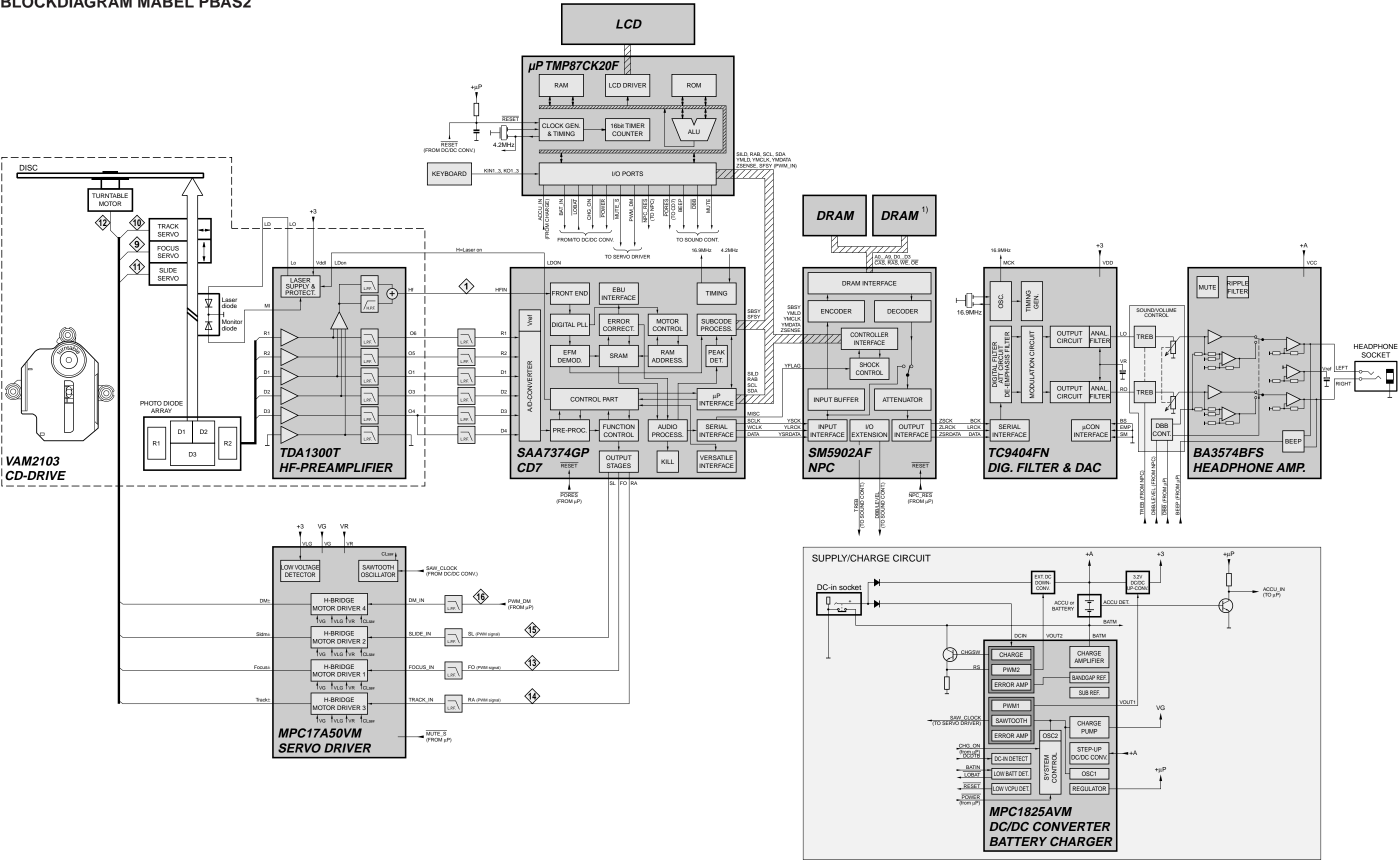
Press "STOP" on the CD-player to exit the key test.

table2 – playback error analysis

CODE	ERROR	TYPE	CAUSE
E 1000	focus error	non fatal	Focus point lost for at least 3ms.
E 1001	radial error	non fatal	CD7 indicates offtrack while radial tracking is switched on.
E 1002	sledge in error	non fatal	The slide did not reach it's inner pos. (inner switch of CDM doesn't close) within approx. 6 seconds.
E 1003	sledge out error	non fatal	The slide did not come out of it's inner pos. (inner switch of CDM is open) within approx. 250ms.
E 1004	DRAM filling error	non fatal	The DRAM controller was not able to connect two consecutive audio frames. The microcontroller had to perform a direct audio connection that produces audible clicks.
E 1005	jump error	non fatal	The offtrack values of CD7 don't decrease properly when jumping tracks, the jump destination could not be found.
E 1006	subcode error	non fatal	No valid subcode for approx. 230ms.
E 1008	turntable motor error	fatal	During start-up, the disc speed did not reach 75% of the nom. speed within approx. 6 seconds.
E 1020	focus search error	fatal	The focus point could not be found within approx. 10 seconds (no valid TOC info), resp. 30 seconds (valid TOC info).



BLOCKDIAGRAM MABEL PBAS2



1) not on all versions

START-UP PROCEDURE



PINNING OF INTEGRATED CIRCUITS

TDA1300T – HF-PREAMPLIFIER AND LASER SUPPLY CIRCUIT (part of CD-drive VAM2103)

Pin	Name	Direction	Description
1	O4	HF-preamp → CD7	output of current amplifier 4
2	O6	HF-preamp → CD7	output of current amplifier 6
3	O3	HF-preamp → CD7	output of current amplifier 3
4	O1	HF-preamp → CD7	output of current amplifier 1
5	O5	HF-preamp → CD7	output of current amplifier 5
6	O2	HF-preamp → CD7	output of current amplifier 2
7	LDon	CD7 → HF-preamp	control pin for switching the laser on/off
8	Vddl	+3	laser supply voltage
9	Vrfe	HF-preamp →	equalized output voltage of sum signal of amplifiers 1...4
10	Vrf	not connected	unequalized output
11	HG	GND	control pin for gain switch
12	LS	CD7 → HF-preamp	control pin for double speed switch (switches equalization)
13	C	external connection	external capacitor (bandwidth of ALPC)
14	Adj	→ HF-preamp	reference input
15	GND	GND	0V supply, substrate connection
16	Lo	HF-preamp → laser diode	current output to laser diode
17	MI	monitor diode → HF-preamp	laser monitor diode input
18	Vdd	+3	positive supply voltage
19	I2	GND	photo detector input 2 (not used)
20	I5	diode array → HF-preamp	photo detector input 5 (satellite)
21	I1	diode array → HF-preamp	photo detector input 1 (central)
22	I3	diode array → HF-preamp	photo detector input 3 (central)
23	I6	diode array → HF-preamp	photo detector input 6 (satellite)
24	I4	diode array → HF-preamp	photo detector input 4 (central)

TC9404FN – Σ - Δ MODULATION DAC WITH ANALOG FILTER

Pin	Name	Direction	Description
1	VDD	+3	logic power supply
2	T1	GND	test pin
3	P/S	+3	parallel control input, serial control switching input
4	VDA	+3	analog power supply
5	RO	DAC → sound control	audio output right channel
6	GNDA	GND	analog ground
7	VR	→ DAC	reference voltage input
8	GNDA	GND	analog ground
9	LO	DAC → sound control	audio output left channel
10	VDA	+3	analog power supply
11	L/R	not connected	digital 0 detection output
12	GNDD	GND	64fs/256fs/384fs system clock input
13	MCK	DAC →	master clock output
14	GNDX	GND	crystal oscillator ground
15	XI	→ DAC	crystal oscillator input
16	XO	DAC →	crystal oscillator output
17	VDX	+3	crystal oscillator power supply
18	BS	GND	parallel control: de-emphasis filter mode select input
19	(LATCH) EMP	GND	serial control: data latch signal input for ATT;
20	(SHIFT) SM	GND	parallel control: de-emphasis filter control input
21	(ATT) HS	GND	serial control: shift clock input for ATT;
22	DATA	+3	parallel control: soft mute control input
23	BCK	NPC → DAC	serial control: data input for ATT;
24	LRCK	NPC → DAC	standard/double speed operation mode switching input
			data input
			bit clock input
			LR clock input

SAA7374 – DECODER AND DIGITAL SERVO IC CD7 (low voltage version)

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	VSSA1	GND	supply (analog) of CD7
2	VDDA1	+3	supply (analog) of CD7
3	D1	HF-preamp → CD7	unipolar current input (central diode signal input)
4	D2	HF-preamp → CD7	unipolar current input (central diode signal input)
5	D3	HF-preamp → CD7	unipolar current input (central diode signal input)
6	VRL	GND	reference input for ADC
7	D4	HF-preamp → CD7	unipolar current input (central diode signal input)
8	R1	HF-preamp → CD7	unipolar current input (satellite diode signal input)
9	R2	HF-preamp → CD7	unipolar current input (satellite diode signal input)
10	IREFT	→ CD7	current reference for calibration ADC
11	VRH	CD7 →	reference output from ADC
12	VSSA2	GND	supply (analog) of CD7
13	SELPLL	+3	selects whether internal clock multiplier PLL is used
14	ISLICE	CD7 →	current feedback from data slicer
15	HFIN	→ CD7	comparator signal input
16	VSSA3	GND	supply (analog) of CD7
17	HFREF	→ CD7	comparator common mode input
18	IREF	→ CD7	reference current pin (nom. VDD/2)
19	VDDA2	+3	supply (analog) of CD7
20	TEST1	GND	test control input
21	CRIN	μP → CD7	crystal/resonator input
22	CDOUT	CD7 →	crystal/resonator output
23	TEST2	GND	test control input
24	CL16	CD7 →	16.9344MHz system clock output
25	CL11	CD7 →	11.2896MHz or 5.6448MHz clock output (3-state)
26	RA	CD7 → servo driver	radial actuator output
27	FO	CD7 → servo driver	focus actuator output
28	SL	CD7 → servo driver	slide actuator output
29	TEST3	GND	test control input
30	VDD1P	+3	supply (digital) of CD7
31	DOBM	CD7 →	bi-phase mark output (3-state)
32	VSS1	GND	supply (digital) of CD7
33	MOTO1	CD7 →	motor output1 of CD7; versatile (3-state)
34	MOTO2	CD7 →	motor output2 of CD7; versatile (3-state)
35	SBSY	CD7 → NPC	subcode block sync (3-state)
36	SFSY	CD7 → μP	subcode frame sync (3-state)
37	RCK	→ CD7	subcode clock input
38	SUB	CD7 →	P to W subcode bits (3-state)
39	VSS2	GND	supply (digital) of CD7
40	V5	CD7 →	versatile output pin of CD7
41	V4	CD7 → HF-preamp	versatile output pin of CD7
42	V3	CD7 → NPC	versatile output pin of CD7 (open drain)
43	KILL	CD7 →	kill output; programmable (open drain)
44	MISC	CD7 → NPC	C2 error flag; output only defined in CD-ROM modes (3-state)
45	DATA	CD7 → NPC	serial data output (3-state)
46	WCLK	CD7 → NPC	word clock output (3-state)
47	VDD2P	+3	supply (digital) of CD7
48	SCLK	CD7 → NPC	serial bit clock output (3-state)
49	VSS3	GND	supply (digital) of CD7
50	CL4	CD7 →	4.2336MHz μP clock output
51	SDA	μP ↔ CD7	μP interface data I/O line (open drain output)
52	SCL	μP → CD7	μP interface clock line
53	RAB	μP → CD7	μP interface R/W and load control line
54	SILD	μP → CD7	μP interface R/W and load control line
55	NC		no connection
56	VSS4	GND	supply (digital) of CD7
57	RESET	μP → CD7	power-on reset input (active low)
58	STATUS	CD7 → μP	servo interrupt request line/CD7 status register output (open drain)
59	VDD3C	+3	supply core (digital)
60	C2FAIL	CD7 →	indication of correction failure (open drain)
61	CFLG	CD7 →	correction flag output (open drain)
62	V1	→ CD7	versatile input pin
63	V2	→ CD7	versatile input pin
64	LDON	CD7 → HF-preamp	laser drive on output (open drain)

SM5902AF – COMPRESSION-TYPE ANTI-SHOCK MEMORY CONTROLLER NPC

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	VDD	+3	supply voltage
2	UC1	DRAM SELECT → NPC	μP interface extension I/O line 1
3	UC2	DRAM SELECT → NPC	μP interface extension I/O line 2
4	UC3	NPC → SOUND CONTROL	μP interface extension I/O line 3
5	UC4	NPC → SOUND CONTROL	μP interface extension I/O line 4
6	UC5	INNERSWITCH CDM → NPC	μP interface extension I/O line 5
7	DIT	NPC →	digital audio interface output
8	TEST2		test pin
9	CLK	DAC → NPC	16.9344MHz clock input
10	VSS	GND	ground
11	YSRDATA	CD7 → NPC	audio serial data input
12	YLRCK	CD7 → NPC	audio serial L/R clock input
13	YSCK	CD7 → NPC	audio serial bit clock input
14	ZSCK	NPC → DAC	audio serial bit clock output
15	ZLRCK	NPC → DAC	audio serial L/R clock output
16	ZSRDATA	NPC → DAC	audio serial data output
17	YFLAG	CD7 → NPC	signal processor IC RAM overflow flag
18	YFCLK	GND	crystal-controlled frame clock input
19	YBLCK	CD7 → NPC	subcode block clock signal output
20	RESET	μP → NPC	system reset input (active low)
21	ZSENSE	NPC → μP	μP interface status output
22	VDD2	+3	supply voltage
23	YDMUTE	GND	forced mute input
24	YMLD	μP → NPC	μP interface latch clock input
25	YMDATA	μP → NPC	μP interface serial data input
26	YMCLK	μP → NPC	μP interface shift clock input
27	OE	NPC → DRAM	DRAM OE control output (active low)
28	CAS	NPC → DRAM	DRAM CAS control output (active low)
29	D2	NPC ↔ DRAM	DRAM data input/output 2
30	D3	NPC ↔ DRAM	DRAM data input/output 3
31	D0	NPC ↔ DRAM	DRAM data input/output 0
32	D1	NPC ↔ DRAM	DRAM data input/output 1
33	WE	NPC → DRAM	DRAM WE control output (active low)
34	RAS	NPC → DRAM	DRAM RAS control output (active low)
35	A9	NPC → DRAM	DRAM address output 9
36	A8	NPC → DRAM	DRAM address output 8
37	A7	NPC → DRAM	DRAM address output 7
38	A6	NPC → DRAM	DRAM address output 6
39	A5	NPC → DRAM	DRAM address output 5
40	A4	NPC → DRAM	DRAM address output 4
41	A0	NPC → DRAM	DRAM address output 0
42	A1	NPC → DRAM	DRAM address output 1
43	A2	NPC → DRAM	DRAM address output 2
44	A3	NPC → DRAM	DRAM address output 3

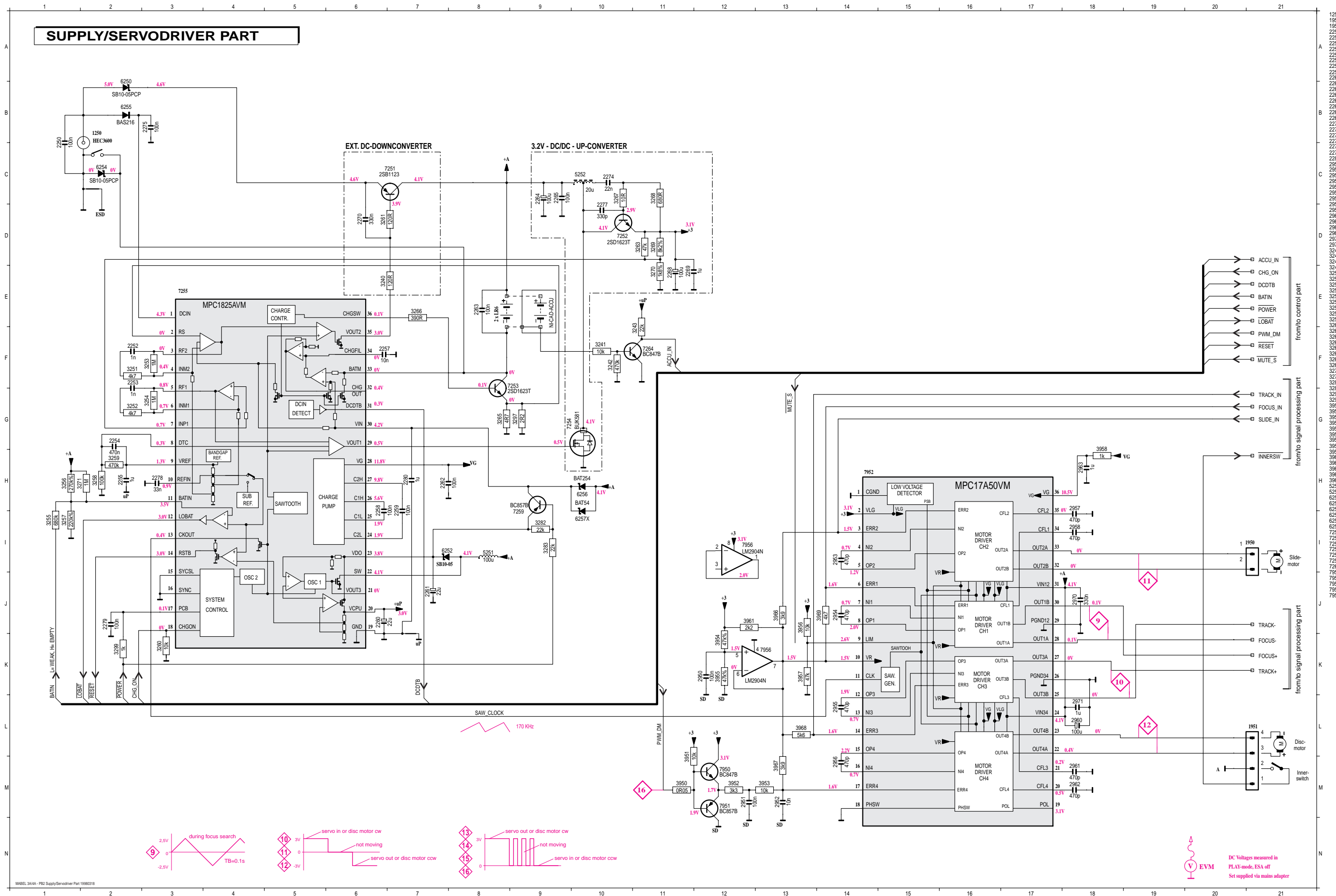
MPC17A50VM – 4-CHANNEL H-BRIDGE SERVODRIVER

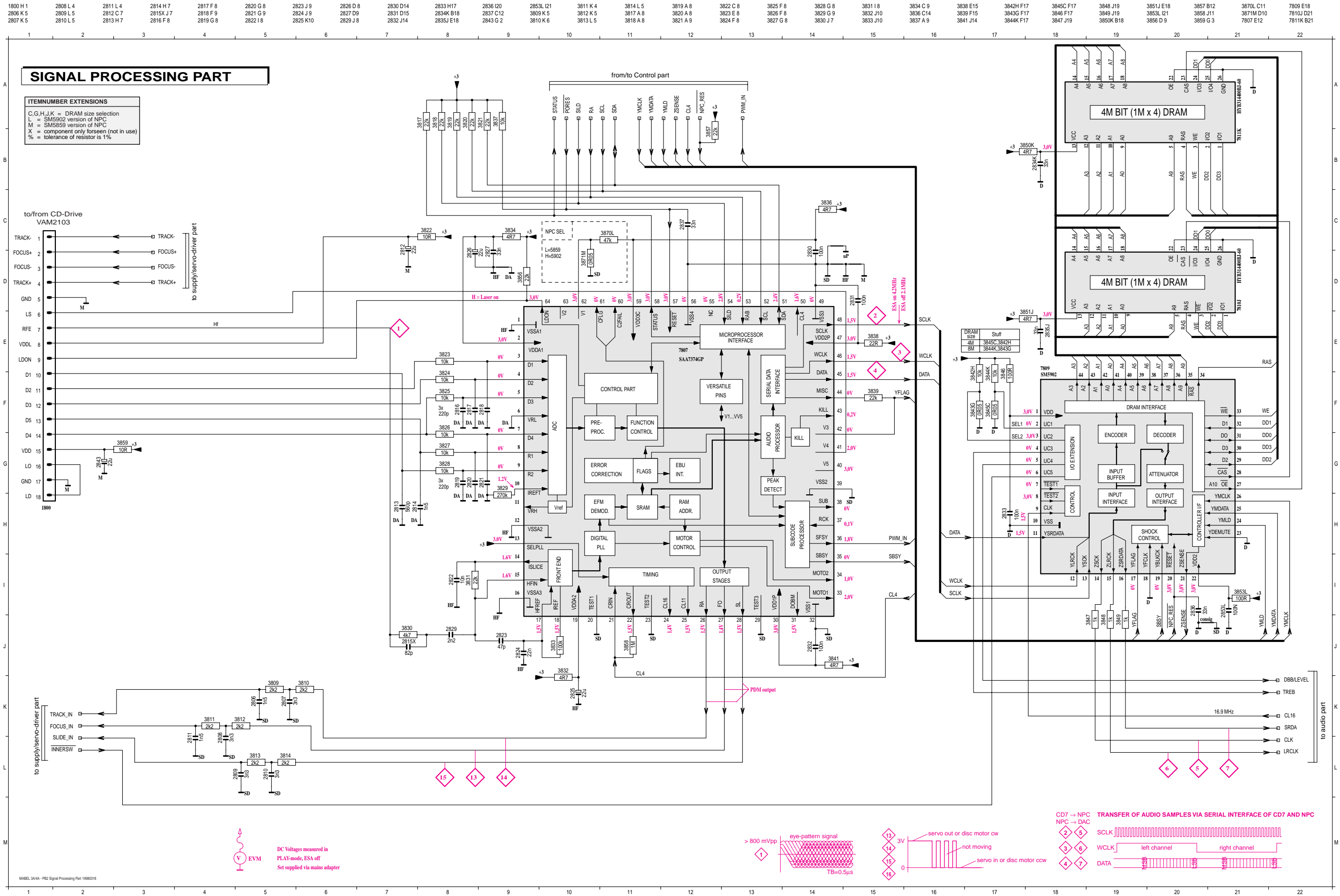
<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	CGND	GND	ground (control part)
2	VLG	+3	power supply input (control part)
3	ERR2	CD7 → servo driver	error level input (slide error signal)
4	NI2	→ servo driver	filter capacitor connection in ABS amp circuit section
5	OP2	→ servo driver	filter capacitor connection in ABS amp circuit section
6	ERR1	CD7 → servo driver	error level input (focus error signal)
7	NI1	→ servo driver	filter capacitor connection in ABS amp circuit section
8	OP1	→ servo driver	filter capacitor connection in ABS amp circuit section
9	LIM	→ servo driver	limit control level signal input
10	VR	→ servo driver	control reference voltage input (VR=VLG/2)
11	CLK	DC/DC converter → servo driver	clock signal input
12	OP3	→ servo driver	filter capacitor connection in ABS amp circuit section
13	NI3	→ servo driver	filter capacitor connection in ABS amp circuit section
14	ERR3	CD7 → servo driver	error level input (track error signal)
15	OP4	→ servo driver	filter capacitor connection in ABS amp circuit section
16	NI4	→ servo driver	filter capacitor connection in ABS amp circuit section
17	ERR4	μP → servo driver	error level input (disc speed error signal)
18	PHSW	GND	CH4 mode setup (if PHSW=high, CH4 operates half-bridge)
19	POL	not connected	CH4 polarity monitor output
20	CFL4	→ servo driver	pin for connecting filter for capacitor
21	CFL3	→ servo driver	pin for connecting filter for capacitor
22	OUT4A	servo driver → disc motor	H-bridge output A
23	OUT4B	servo driver → disc motor	H-bridge output B
24	VIN34	+A	CH3 and CH4 output stage power supply
25	OUT3B	servo driver → track actuator	H-bridge output B
26	PGND34	GND	CH3 and CH4 output stage ground
27	OUT3A	servo driver → track actuator	H-bridge output A
28	OUT1A	servo driver → focus actuator	H-bridge output A
29	PGND12	GND	CH1 and CH2 output stage ground
30	OUT1B	servo driver → focus actuator	H-bridge output B
31	VIN12	+A	CH1 and CH2 output stage power supply
32	OUT2B	servo driver → slide motor	H-bridge output B
33	OUT2A	servo driver → slide motor	H-bridge output A
34	CFL1	→ servo driver	pin for connecting filter for capacitor
35	CFL2	→ servo driver	pin for connecting filter for capacitor
36	VG	VG	power supply input (predriver circuit)

MPC1825A – DC/DC CONVERTER AND BATTERY CHARGER

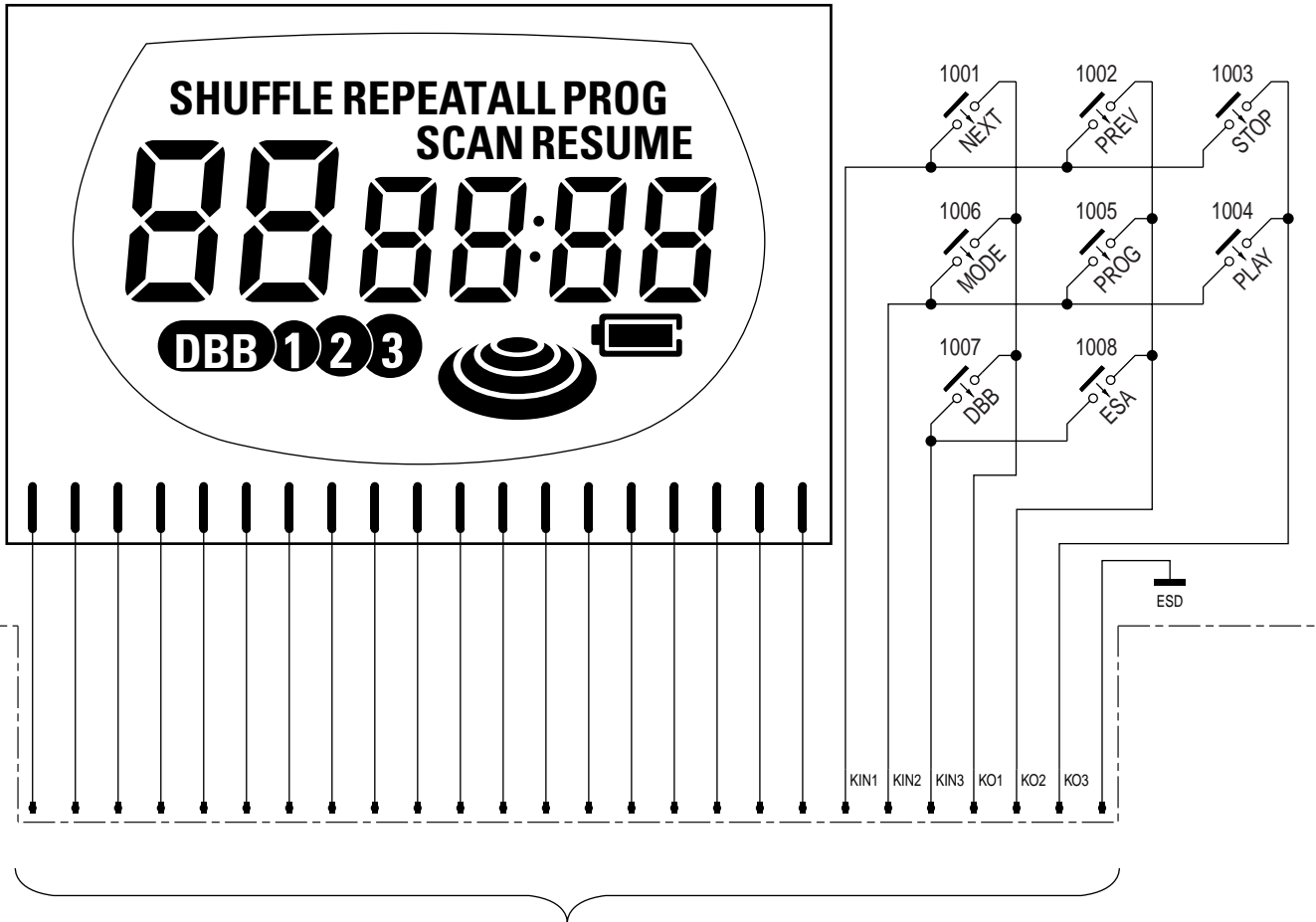
<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	DCIN	+DC	DC power supply input
2	RS	→ DC/DC converter	detection input of charge current (battery charger block)
3	RF2	→ DC/DC converter	connection of error amplifier feedback resistor (battery charger block)
4	INM2	→ DC/DC converter	inverting input of error amplifier (battery charger block)
5	RF1	DC/DC converter →	connection of feedback resistor (switched power supply block)
6	INM1	→ DC/DC converter	inverting input of error amplifier (switched power supply block)
7	INP1	→ DC/DC converter	non-inverting input of error amplifier (switched power supply block)
8	DTC	→ DC/DC converter	dead time control input (switched power supply block)
9	VREF	DC/DC converter →	reference voltage output
10	REFIN	→ DC/DC converter	external reference voltage input
11	BATIN	→ DC/DC converter	input voltage supervises battery cell
12	LOBAT	DC/DC converter → μ P	low voltage detection output
13	CKOUT	DC/DC converter → servo driver	clock output
14	RSTB	DC/DC converter → μ P	reset signal output
15	SYCSL	GND	88.2kHz/176.4kHz mode select input
16	SYNC	GND	external clock input
17	PCB	μ P → DC/DC converter	system control input
18	CHGON	μ P → DC/DC converter	system control input
19	GND	GND	ground
20	VCPU	DC/DC converter → + μ P	3V regulated voltage output
21	VOU3	not connected	DC/DC converter control signal output for system power supply
22	SW	+A	DC/DC converter driver output for system power supply (open drain)
23	VDO	DC/DC converter →	DC/DC converter output for system power supply
24	C2L	external connection	capacitor connection for charge pump
25	C1L	external connection	capacitor connection for charge pump
26	C1H	external connection	capacitor connection for charge pump
27	C2H	external connection	capacitor connection for charge pump
28	VG	DC/DC converter → VG	charge pump circuit output
29	VOU1	DC/DC converter →	external driver control signal at DC/DC converter
30	VIN	→ DC/DC converter	battery connection (+)
31	DCDTB	DC/DC converter →	DCIN detection circuit output
32	CHGOUT	not connected	rechargeable battery voltage detection circuit output
33	BATM	DC/DC converter → battery (-)	battery connection (-)
34	CHGFIL	external connection	external filter capacitor connection for battery charger voltage detection
35	VOU2	DC/DC converter →	external driver control signal (battery charger voltage block)
36	CHGSW	DC/DC converter →	battery charger switch control output

SUPPLY/SERVO DRIVER PART





MEMBRANE ASSEMBLY 4822 360 10363



TO/FROM CONTROL PART / 1401

Resume/Hold
1418 SSSS2-13
RESUME
HOLD

Start-up circuit
DCDTB
KIN2
KIN3
2404 1n
3421 1M
3417 1M
7404 BC847B
2.5V
2405 1n
3423 1M
3425 1M
7405 BC857B
3.0V
3424 47k
+uP

from/to membrane assembly
1401
C0 C1 C2 C3 S S0 S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 KIN1 KIN2 KIN3 KO1 KO2 KO3
26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
1.5V 1.5V 1.5V 1.5V
+uP
3401 220k
3402 220k
3403 220k
ESD

7400 TMP87CH20F
LCD-DRIVER
ROM
RAM
8 BIT CPU
16 BIT TIMER/COUNTER
WATCHDOG TIMER
I/O P2
RESET
CLOCK
VSS
P2
I/O PORT P3
I/O PORT P0
VDD
I/O PORT P1
I/O P5
I/O P4
TEST
DBB
MUTE
BEEP
SDA
SCL
RA
SILD
STATUS
PORES
CL4
YMCLK
YMDATA
YMLD
ZSENSE
NPC_RES
PWM_IN

SERVICE TEST
COM 3
Pin 6
3.8V
TB 5ms/Div

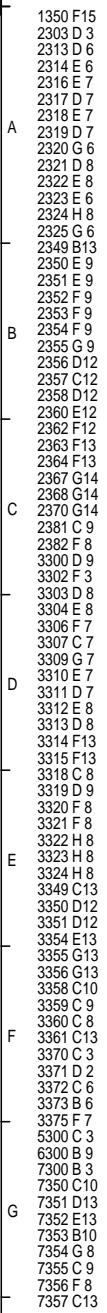
from/to audio part
from/to signal processing part

DC Voltages measured in PLAY-mode, ESA off
Set supplied via mains adapter

MABEL3A/4A - PB2 Control Part 19980318

CS 46 529

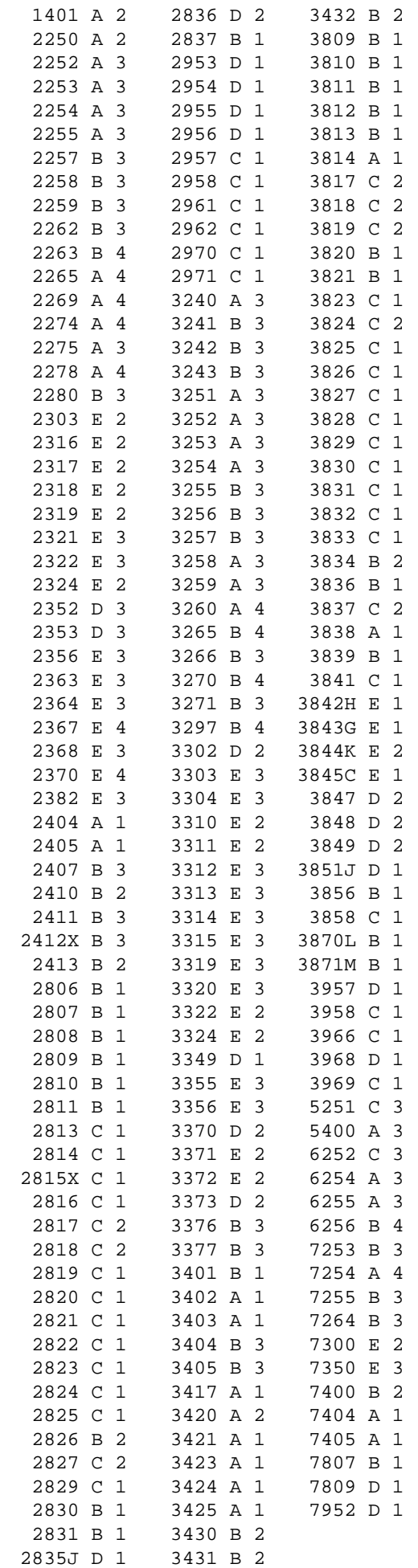
1



5 SCLK

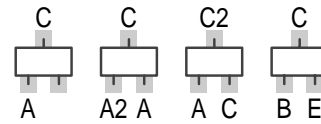
6 WCLK

7 DATA

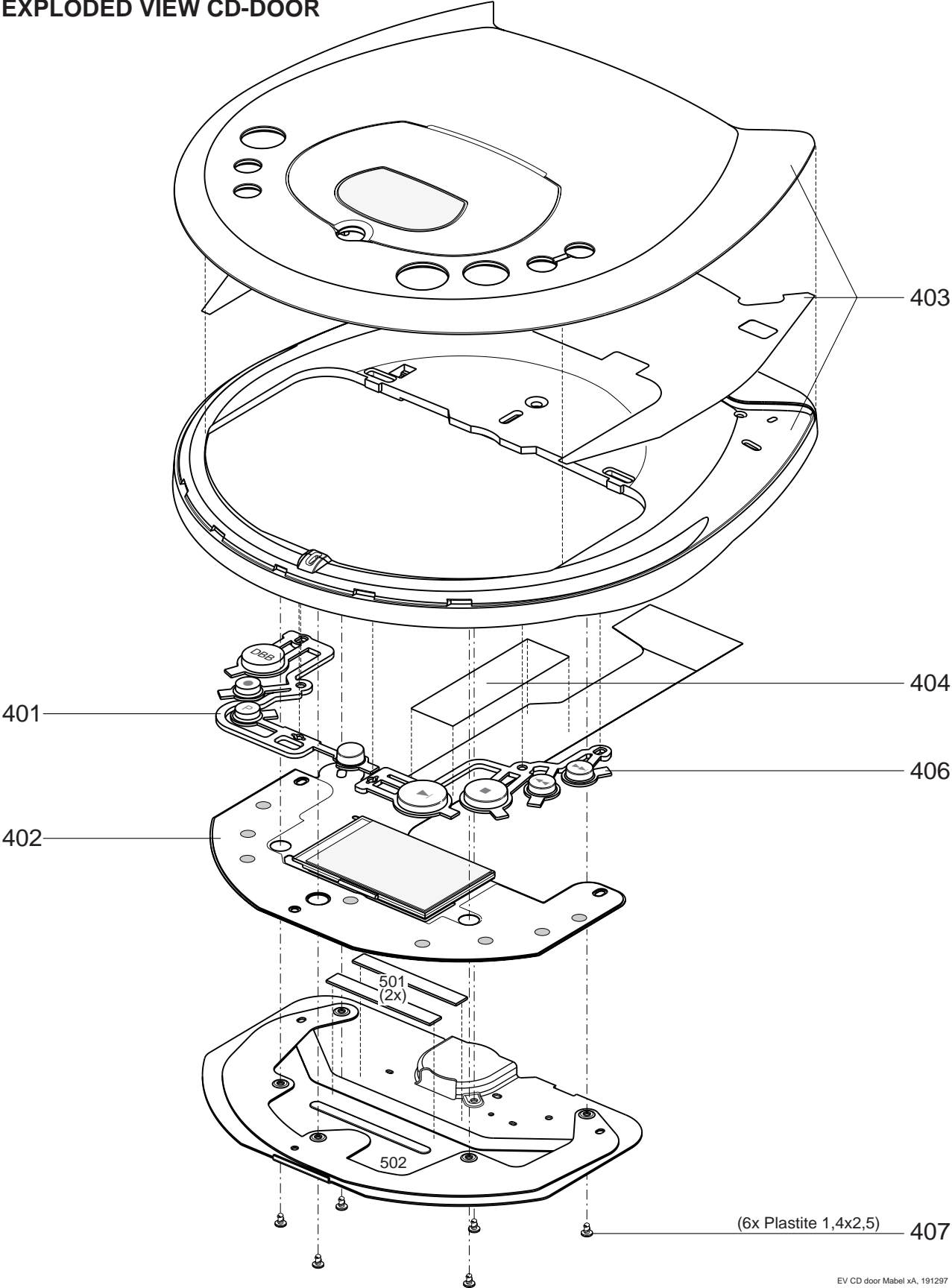


1250	A	3	3853L	D	2
1350	E	4	3857	D	2
1418	E	2	3859	D	1
1430	A	4	3950	C	1
1800	D	1	3951	C	1
1950	A	4	3952	D	1
1951	D	2	3953	D	1
2260	B	4	3954	C	1
2261	B	4	3955	C	1
2264	A	4	3956	D	1
2268	B	4	3961	C	1
2270	A	3	3967	D	1
2277	A	4	5252	A	4
2279	A	4	5300	D	2
2313	E	2	6250	A	3
2314	E	2	6257X	B	4
2320	D	3	6300	C	3
2323	E	2	7251	A	3
2325	E	2	7252	A	4
2349	E	3	7259	B	4
2350	D	3	7351	E	3
2351	D	3	7352	E	3
2354	D	3	7353	D	3
2355	D	3	7354	E	2
2357	E	3	7355	E	2
2358	E	3	7356	E	2
2360	E	3	7357	E	3
2362	E	3	7810J	D	2
2381	E	3	7811K	D	2
2812	D	1	7950	D	1
2832	B	1	7951	C	1
2833	D	1	7956	C	1
2834K	E	1			
2843	D	1			
2853L	D	2			
2950	C	1			
2951	C	1			
2952	C	1			
2960	C	1			
2963	C	1			
3261	A	3			
3263	A	4			
3267	A	4			
3268	A	4			
3269	A	4			
3282	B	4			
3283	B	4			
3299	A	4			
3300	E	3			
3306	E	3			
3307	E	2			
3309	E	3			
3318	E	2			
3321	E	2			
3323	E	2			
3350	E	3			
3351	E	3			
3354	E	3			
3358	E	3			
3359	D	3			
3360	C	3			
3361	E	3			
3375	D	3			
3822	D	1			
3846	D	1			
3850K	E	1			

This assembly drawing shows a summary
of all possible versions.
For components used in a specific version
see schematic diagram respectively partslist.

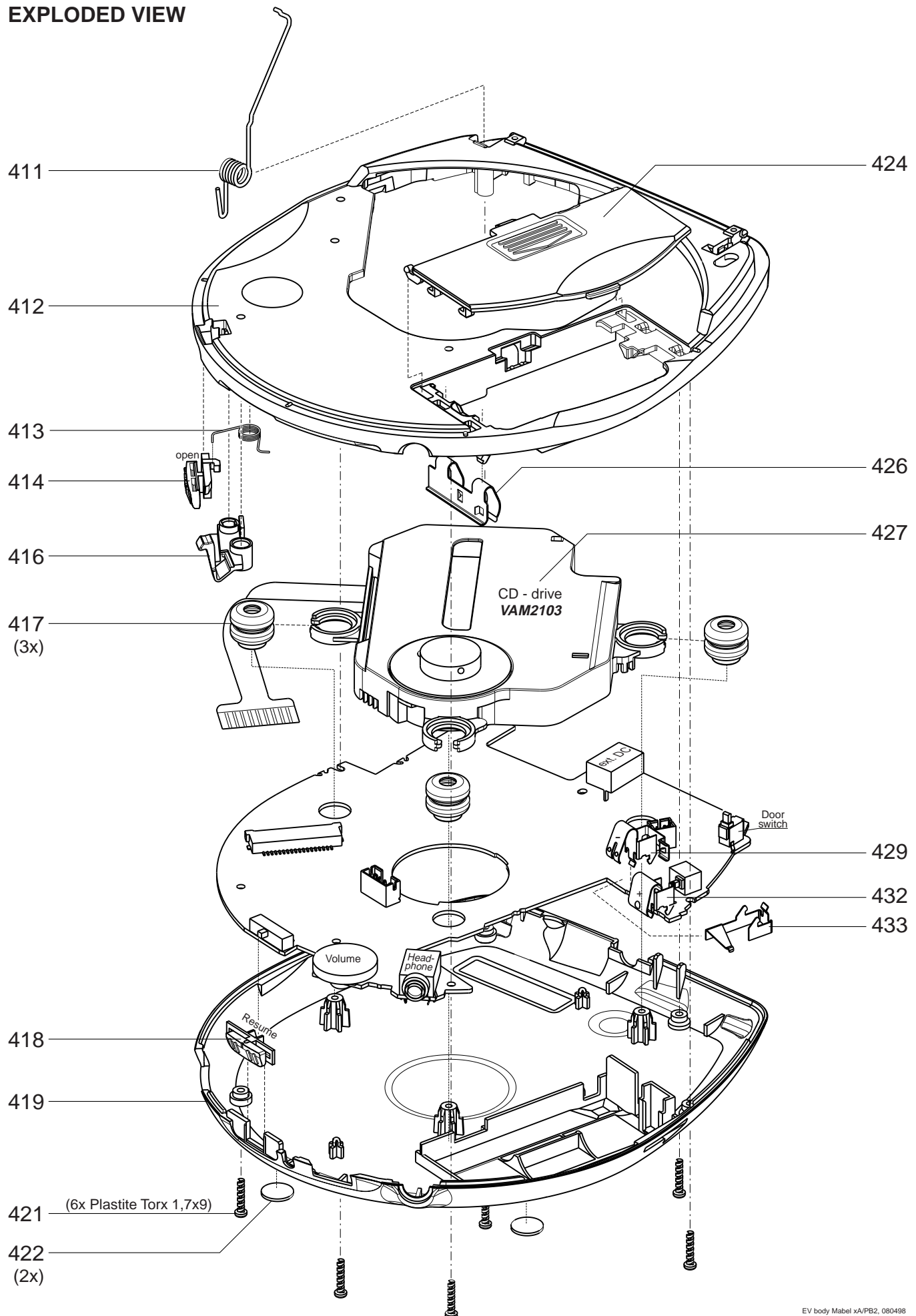


EXPLODED VIEW CD-DOOR



EV CD door Mabel xA, 191297

EXPLODED VIEW



MECHANICAL PARTSLIST

401	4822 410 11567	BUTTON-SET-ESA-2-LAC-PRINTED
402	4822 360 10363	MEMBRANE-LCD-2 ASSY
403	4822 443 10893	SERV.ASSY CD-DOOR (2) PH AZ738x only
403	4822 443 10894	SERV.ASSY CD DOOR (2) MVX AZ738x only
403	4822 443 10895	SERV.ASSY CD DOOR (2-25) PH AZ748x only
403	4822 443 10896	SERV.ASSY CD DOOR (2-25) MVX AZ748x only
404	4822 320 12214	FOIL-ADHESIVE-FLEX
406	4822 410 11568	BUTTON-SET-STOP-2-LAC.
407	4822 502 14513	SCREW PLASTITE 1.4x2.5
411	4822 492 11524	SPRING-OPEN-CD DOOR
412	4822 449 80201	CABINET(L)-PRINTED
413	4822 492 11523	SPRING-SLIDER-OPEN
414	4822 463 11176	SLIDER-OPEN
416	4822 402 10896	LEVER-OPEN
417	4822 402 10897	DAMPER-CD DRIVE
418	4822 463 11177	SLIDER-RESUME
419	4822 442 01191	BOTTOM-L
421	4822 502 21247	SCREW PLASTITE TORX 1.7x9
422	4822 462 41819	RUBBER FOOT
424	4822 443 10859	DOOR-BATTERY
426	4822 492 11525	SPRING-BATTERY-SHORTCIRCUIT
427	4822 691 10665	VAM 2103, CD DRIVE
429	4822 492 11517	SPRING-BATTERY –
431	4822 535 10522	ACTUATING PIN-RECHARGE
432	4822 492 11516	SPRING-BATTERY +

Differences for coloured versions

AZ7484(blue) and AZ7386(green)

403	SERV.ASSY CD-DOOR → code number follows by Service Information
412	4822 449 80238 CABINET(L)-PRINTED
419	4822 442 01329 BOTTOM-L
424	4822 443 10918 DOOR-BATTERY

AZ7385(gold) and AZ7387(bronze)

401	BUTTON SET-ESA → code number follows by Service Information
403	SERV.ASSY CD-DOOR → code number follows by Service Information
406	BUTTON SET-STOP → code number follows by Service Information
412	4822 449 80238 CABINET(L)-PRINTED
419	4822 442 01329 BOTTOM-L
424	4822 443 10918 DOOR-BATTERY

ELECTRICAL PARTSLIST

MISCELLANEOUS

1250	4822 265 10626	SOCKET, EXT. SUPPLY
1350	4822 265 11247	HEADPHONE SOCKET
1401	4822 267 10694	CONNECTOR, FLEXFOIL (26 pins)
1418	4822 277 21705	SLIDE SWITCH, RESUME/HOLD
1430	4822 276 12889	SWITCH, CD-DOOR

CAPACITORS

2250 ©	4822 126 14305	100nF	10%	16V
2252 ©	5322 126 11578	1nF	10%	63V
2253 ©	5322 126 11578	1nF	10%	63V
2254 ©	4822 124 12096	470nF	10%	16V
2255 ©	4822 123 14042	1µF	10%	16V
2257 ©	4822 123 14045	10nF	10%	50V
2258 ©	4822 126 14305	100nF	10%	16V
2259 ©	4822 126 14305	100nF	10%	16V
2260	4822 124 40998	22µF	20%	6,3V
2261	4822 124 40998	22µF	20%	6,3V
2262 ©	4822 126 14305	100nF	10%	16V
2263 ©	4822 126 14305	100nF	10%	16V
2264	4822 124 42234	100µF	20%	6,3V
2265 ©	4822 126 14305	100nF	10%	16V
2268 ©	4822 124 12108	100µF	20%	4V
2269 ©	4822 123 14042	1µF	10%	16V
2270 ©	4822 126 12102	330nF	20%	50V
2274 ©	4822 126 14239	22nF		25V
2275 ©	4822 126 14305	100nF	10%	16V
2277 ©	4822 126 14243	330pF		50V
2278 ©	4822 126 14242	33nF		16V
2279 ©	4822 126 14305	100nF	10%	16V
2280 ©	4822 123 14042	1µF	10%	16V
2303 ©	4822 126 14305	100nF	10%	16V
2313 ©	4822 124 12108	100µF	20%	4V
2314 ©	4822 124 12194	2,2µF	20%	50V
2316 ©	4822 126 14238	2,2nF		50V
2317 ©	4822 126 14238	2,2nF		50V
2318 ©	4822 123 14042	1µF	10%	16V
2319 ©	4822 123 14042	1µF	10%	16V
2320 ©	4822 124 81061	22µF	20%	6,3V
2321 ©	4822 126 14247	1,5nF		50V
2322 ©	4822 126 14247	1,5nF		50V
2323 ©	4822 124 12108	100µF	20%	4V
2324 ©	4822 123 14042	1µF	10%	16V
2325 ©	4822 126 14305	100nF	10%	16V
2349 ©	4822 126 14242	33nF		16V
2350 ©	4822 124 81061	22µF	20%	6,3V
2351 ©	4822 124 81061	22µF	20%	6,3V
2352 ©	5322 124 10798	1µF	20%	16V
2353 ©	4822 124 12107	22µF	20%	4V
2354 ©	4822 126 14305	100nF	10%	16V
2355 ©	4822 124 81061	22µF	20%	6,3V
2356 ©	4822 123 14018	2,2µF	10%	10V
2357 ©	4822 126 14305	100nF	10%	16V
2358 ©	4822 126 14305	100nF	10%	16V
2360 ©	4822 123 14042	1µF	10%	16V
2362 ©	4822 124 11348	2,2µF	20%	10V
2363 ©	4822 126 14305	100nF	10%	16V
2364 ©	4822 126 14305	100nF	10%	16V
2367 ©	4822 126 14242	33nF		16V
2368 ©	4822 126 14242	33nF		16V
2370 ©	4822 126 14243	330pF		50V
2381 ©	4822 126 12102	330nF	20%	50V
2382 ©	4822 126 12102	330nF	20%	50V

CAPACITORS

2404	©	5322	126	11578	1nF	10%	63V
2405	©	5322	126	11578	1nF	10%	63V
2407	©	4822	126	14305	100nF	10%	16V
2410	©	5322	126	11578	1nF	10%	63V
2411	©	4822	126	14246	22pF		50V

2413	©	4822	126	14239	22nF		25V
2806	©	4822	126	14247	1,5nF		50V
2807	©	4822	126	14248	3,3nF		50V
2808	©	4822	126	14248	3,3nF		50V
2809	©	4822	126	14248	3,3nF		50V

2810	©	4822	126	14248	3,3nF		50V
2811	©	4822	126	14247	1,5nF		50V
2812	©	4822	124	81061	22μF	20%	6,3V
2813	©	4822	126	14249	560pF	10%	50V
2814	©	4822	126	14247	1,5nF		50V

2815	©	4822	126	14226	82pF		50V
2816	©	4822	126	14251	220pF	10%	50V
2817	©	4822	126	14251	220pF	10%	50V
2818	©	4822	126	14251	220pF	10%	50V
2819	©	4822	126	14251	220pF	10%	50V

2820	©	4822	126	14251	220pF	10%	50V
2821	©	4822	126	14251	220pF	10%	50V
2822	©	4822	123	14045	10nF	10%	50V
2824	©	4822	126	14239	22nF		25V
2825	©	4822	124	12107	22μF	20%	4V

2826	©	4822	124	12107	22μF	20%	4V
2827	©	4822	126	14242	33nF		16V
2829	©	4822	126	14238	2,2nF		50V
2830	©	4822	126	14305	100nF	10%	16V
2831	©	4822	126	14305	100nF	10%	16V

2832	©	4822	126	14305	100nF	10%	16V
2833	©	4822	126	14305	100nF	10%	16V
2834	©	4822	126	14242	33nF		16V
2835	©	4822	126	14242	33nF		16V
2836	©	4822	126	14242	33nF		16V

2837	©	4822	126	14242	33nF		16V
2843	©	4822	124	81061	22μF	20%	6,3V
2853	©	4822	126	14305	100nF	10%	16V
2950	©	4822	126	14305	100nF	10%	16V
2951	©	4822	126	14305	100nF	10%	16V

2952	©	4822	123	14045	10nF	10%	50V
2953	©	4822	126	14245	470pF		50V
2954	©	4822	126	14245	470pF		50V
2955	©	4822	126	14245	470pF		50V
2956	©	4822	126	14245	470pF		50V

2957	©	4822	126	14245	470pF		50V
2958	©	4822	126	14245	470pF		50V
2960	©	4822	124	11519	100μF	20%	10V
2961	©	4822	126	14245	470pF		50V
2962	©	4822	126	14245	470pF		50V

2963	©	4822	123	14042	1μF	10%	16V
2970	©	4822	126	12102	330nF	20%	50V
2971	©	4822	123	14042	1μF	10%	16V

RESISTORS

3240	©	4822	051	30121	120Ω	5%	0,0625W
3241	©	4822	117	12893	10kΩ	5%	0,0625W
3242	©	4822	117	12892	470kΩ	5%	0,0625W
3243	©	4822	117	12883	22kΩ	5%	0,0625W
3251	©	4822	117	12886	4,7kΩ	5%	0,0625W

3252	©	4822	117	12886	4,7kΩ	5%	0,0625W
3253	©	4822	117	12887	1MΩ	5%	0,0625W
3254	©	4822	117	12887	1MΩ	5%	0,0625W
3255	©	4822	117	12888	680kΩ	5%	0,0625W

RESISTORS

3256	©	4822	117	12889	270kΩ	1%	0,0625W
3257	©	4822	117	12891	220kΩ	1%	0,0625W
3258	©	4822	117	12884	100kΩ	5%	0,0625W
3259	©	4822	117	12892	470kΩ	5%	0,0625W
3260	©	4822	117	12893	10kΩ	5%	0,0625W

3261	©	4822	051	30121	120Ω	5%	0,0625W
3263	©	4822	117	12896	47kΩ	5%	0,0625W
3265	©	4822	051	20478	4,7Ω	5%	0,1W
3266	©	4822	117	12898	390Ω	5%	0,0625W
3267	©	4822	117	12899	10Ω	5%	0,0625W

3268	©	4822	117	12901	680Ω	5%	0,0625W
3269	©	4822	117	12902	8,2kΩ	1%	0,0625W
3270	©	4822	117	12903	1,8kΩ	1%	0,0625W
3271	©	4822	117	12887	1MΩ	5%	0,0625W
3282	©	4822	117	12883	22kΩ	5%	0,0625W

3283	©	4822	117	12883	22kΩ	5%	0,0625W
3297	©	4822	051	20228	2,2Ω	5%	0,1W
3299	©	4822	117	12913	1kΩ	5%	0,0625W
3300	©	4822	101	11866	10kΩ	20%	0,3W
3302	©	4822	117	12896	47kΩ	5%	0,0625W

3303	©	4822	117	12905	8,2kΩ	5%	0,0625W
3304	©	4822	117	12905	8,2kΩ	5%	0,0625W
3306	©	4822	051	30151	150Ω	5%	0,0625W
3307	©	4822	051	30151	150Ω	5%	0,0625W
3309	©	4822	051	30151	150Ω	5%	0,0625W

3310	©	4822	117	12914	220Ω	5%	0,0625W
3311	©	4822	117	12914	220Ω	5%	0,0625W
3312	©	4822	117	12915	27kΩ	5%	0,0625W
3313	©	4822	117	12915	27kΩ	5%	0,0625W
3314	©	4822	117	12917	1Ω	5%	0,0625W

3315	©	4822	117	12917	1Ω	5%	0,0625W
3318	©	4822	117	12893	10kΩ	5%	0,0625W
3319	©	4822	117	12908	2,2kΩ	5%	0,0625W
3320	©	4822	117	12908	2,2kΩ	5%	0,0625W
3321	©	4822	117	12893	10kΩ	5%	0,0625W

3322	©	4822	117	12896	47kΩ	5%	0,0625W
3323	©	4822	117	12896	47kΩ	5%	0,0625W
3324	©	4822	117	12883	22kΩ	5%	0,0625W
3349	©	4822	117	12887	1MΩ	5%	0,0625W
3350	©	4822	117	12887	1MΩ	5%	0,0625W

3351	©	4822	117	12884	100kΩ	5%	0,0625W
3354	©	4822	117	12893	10kΩ	5%	0,0625W
3355	©	4822	117	12916	2,2Ω	5%	0,0625W
3356	©	4822	117	12916	2,2Ω	5%	0,0625W
3358	©	4822	117	12911	100Ω	5%	0,0625W

3359	©	4822	117	12913	1kΩ	5%	0,0625W
3360	©	4822	117	12893	10kΩ	5%	0,0625W
3361	©	4822	117	12884	100kΩ	5%	0,0625W
3370	©	4822	117	12913	1kΩ	5%	0,0625W
3371	©	4822	117	12911	100Ω	5%	0,0625W

3372	©	4822	051	30008	CHIP JUMPER 0603		
3373	©	4822	051	30008	CHIP JUMPER 0603		
3375	©	4822	051	30008	CHIP JUMPER 0603		
3376	©	4822	117	12887	1MΩ	5%	0,0625W
3377	©	4822	117	12887	1MΩ	5%	0,0625W

3401	©	4822	117	12919	220kΩ	5%	0,0625W
3402	©	4822	117	12919	220kΩ	5%	0,0625W
3403	©	4822	117	12919	220kΩ	5%	0,0625W
3404	©	4822	117	12919	220kΩ	5%	0,0625W
3405	©	4822	117	12919	220kΩ	5%	0,0625W

3417	©	4822	117	12887	1MΩ	5%	0,0625W
3420	©	4822	117	12893	10kΩ	5%	0,0625W
3421	©	4822	117	12887	1MΩ	5%	0,0625W
3423	©	4822	117	12887	1MΩ	5%	0,0625W

RESISTORS

3424	4822 117 12896	47kΩ	5% 0,0625W
3425	4822 117 12887	1MΩ	5% 0,0625W
3430	4822 117 12913	1kΩ	5% 0,0625W
3431	4822 117 12911	100Ω	5% 0,0625W
3432	4822 117 12911	100Ω	5% 0,0625W
3809	4822 117 12908	2,2kΩ	5% 0,0625W
3810	4822 117 12908	2,2kΩ	5% 0,0625W
3811	4822 117 12908	2,2kΩ	5% 0,0625W
3812	4822 117 12908	2,2kΩ	5% 0,0625W
3813	4822 117 12908	2,2kΩ	5% 0,0625W
3814	4822 117 12908	2,2kΩ	5% 0,0625W
3817	4822 117 12883	22kΩ	5% 0,0625W
3818	4822 117 12883	22kΩ	5% 0,0625W
3819	4822 117 12883	22kΩ	5% 0,0625W
3820	4822 117 12883	22kΩ	5% 0,0625W
3821	4822 117 12883	22kΩ	5% 0,0625W
3822	4822 117 12899	10Ω	5% 0,0625W
3823	4822 117 12893	10kΩ	5% 0,0625W
3824	4822 117 12893	10kΩ	5% 0,0625W
3825	4822 117 12893	10kΩ	5% 0,0625W
3826	4822 117 12893	10kΩ	5% 0,0625W
3827	4822 117 12893	10kΩ	5% 0,0625W
3828	4822 117 12893	10kΩ	5% 0,0625W
3829	4822 117 12922	270kΩ	5% 0,0625W
3830	4822 117 12886	4,7kΩ	5% 0,0625W
3831	4822 117 12883	22kΩ	5% 0,0625W
3832	4822 117 12923	4,7Ω	5% 0,0625W
3833	4822 117 12884	100kΩ	5% 0,0625W
3834	4822 117 12923	4,7Ω	5% 0,0625W
3836	4822 117 12923	4,7Ω	5% 0,0625W
3837	4822 117 12893	10kΩ	5% 0,0625W
3838	4822 117 12912	22Ω	5% 0,0625W
3839	4822 117 12883	22kΩ	5% 0,0625W
3841	4822 117 12923	4,7Ω	5% 0,0625W
3842	4822 117 12893	10kΩ	5% 0,0625W
3843	4822 051 30008	CHIP JUMPER 0603	
3844	4822 117 12893	10kΩ	5% 0,0625W
3845	4822 051 30008	CHIP JUMPER 0603	
3846	4822 117 12911	100Ω	5% 0,0625W
3847	4822 117 12913	1kΩ	5% 0,0625W
3848	4822 117 12913	1kΩ	5% 0,0625W
3849	4822 117 12913	1kΩ	5% 0,0625W
3850	4822 117 12923	4,7Ω	5% 0,0625W
3851	4822 117 12923	4,7Ω	5% 0,0625W
3853	4822 117 12911	100Ω	5% 0,0625W
3856	4822 117 12883	22kΩ	5% 0,0625W
3857	4822 117 12883	22kΩ	5% 0,0625W
3858	4822 117 12887	1MΩ	5% 0,0625W
3859	4822 117 12899	10Ω	5% 0,0625W
3870	4822 117 12896	47kΩ	5% 0,0625W
3950	4822 051 30008	CHIP JUMPER 0603	
3951	4822 117 12893	10kΩ	5% 0,0625W
3952	4822 117 12924	3,3kΩ	5% 0,0625W
3953	4822 117 12893	10kΩ	5% 0,0625W
3954	4822 117 12925	47kΩ	1% 0,0625W
3955	4822 117 12925	47kΩ	1% 0,0625W
3956	4822 117 12893	10kΩ	5% 0,0625W
3957	4822 117 12896	47kΩ	5% 0,0625W
3958	4822 117 12913	1kΩ	5% 0,0625W
3961	4822 117 12908	2,2kΩ	5% 0,0625W
3966	4822 051 30392	3,9kΩ	5% 0,06W
3967	4822 051 30392	3,9kΩ	5% 0,06W
3968	4822 051 30562	5,6kΩ	5% 0,0625W
3969	4822 117 12886	4,7kΩ	5% 0,0625W

COILS

5251	4822 157 70753	100μH 10% LQH4N
5252	4822 146 10663	TRANSFORMER 6RG (DC/DC)
5300	4822 242 81545	CER. RES. 16,93MHz
5400	4822 242 10845	CER. RES. 4,23MHz

DIODES

6250	4822 130 82588	SB10-05PCP
6252	4822 130 82588	SB10-05PCP
6254	4822 130 82588	SB10-05PCP
6255	4822 130 83757	BAS216
6256	4822 130 10654	BAT254
6300	4822 130 83757	BAS216

TRANSISTORS

7251	4822 130 62808	2SB1123
7252	4822 130 63646	2SD1623T
7253	4822 130 63646	2SD1623T
7254	4822 130 10736	BUK581-60A
7259	5322 130 60508	BC857B
7264	4822 130 60511	BC847B
7351	4822 130 60511	BC847B
7352	4822 130 60511	BC847B
7353	4822 130 42615	BC817-40
7354	5322 130 60508	BC857B
7355	4822 130 60511	BC847B
7356	4822 130 60511	BC847B
7357	4822 130 60511	BC847B
7404	4822 130 60511	BC847B
7405	5322 130 60508	BC857B
7950	4822 130 60511	BC847B
7951	5322 130 60508	BC857B

INTEGRATED CIRCUITS

7255	4822 209 16081	MPC1825AVM DC/DC-CONVERTER
7300	4822 209 16082	TC9404FN DAC
7350	4822 209 16083	BA3574BFS HEADPHONE AMP.
7400	4822 209 16543	TMP87CK20AF-AZ7395.3
7807	4822 209 16301	SAA7374GP CD7
7809	4822 209 16211	SM5902AF DRAM CONTROLLER
7810	4822 209 16518	HYB314400BJ-60 4Mbit DRAM
7811	4822 209 16518	HYB314400BJ-60 4Mbit DRAM
7952	4822 209 16085	MPC17A50VM SERVO DRIVER
7956	5322 209 12343	LM2904D