

Service
Service
Service



AZ7382
AZ7383
AZ7481
AZ7482
AZ7483
all versions

MABEL PLATFORM 3A/4A

Service Manual



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GB 4822 725 26016



TECHNICAL SPECIFICATION

General

Dimensions (WxHxD) : 128x27.1x136.5mm
 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)	15hrs typ.	18hrs typ.	15hrs typ.
Accu-pack AY3360 (NiMH, 1200mAh)	8.5hrs typ.	9.5hrs typ.	8.5hrs typ.
Accu-pack AY3361 (NiCd, 700mAh)	5hrs typ.	5.5hrs typ.	5hrs typ.

Battery empty detection

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

Charge circuit

Charge current : 320mA nom. \pm 20%
 Charge time for 80% AY3360 : 3.75hrs nom.
 Charge time for 80% AY3361 : 2.0hrs nom.
 Max. charge time (μ P controlled) : 5.5hrs nom.
 Temperature protection : 50°C \pm 5°C

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

OPERATION	ESA OFF	PSM ON	ESA ON
Play-mode	125mA typ.	100mA typ.	130mA typ.
Jump-mode	450mA typ.	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	145mA typ.	127mA typ.	145mA typ.
Jump-mode	450mA typ.	450mA typ.	450mA typ.
Stand-by (excl. recharge)	0.4mA typ.		

Shock resistance (ESA off)

+X/-X direction : \geq 2.5g
 +Y/-Y direction : \geq 2.5g
 +Z/-Z direction : \geq 2.0g

Shock resistance by use of car base (ESA off)

+X/-X direction : \geq 6g
 +Y/-Y direction : \geq 6g
 +Z/-Z direction : \geq 6g

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) : $>$ 80dB (83dB typ.)
 S/N ratio (A-wght) : $>$ 82dB (85dB typ.)
 THD+N (1kHz, 1mW) : $<$ 1% (0.2% typ.)
 Channel crosstalk (1kHz, no load) : $<$ -24dB (-44dB typ.)
 Channel unbalance (-40dB) : $<$ 5dB
 Volume attenuation (1kHz) : $>$ 60dB

CD-out (not on all versions, load impedance 47k Ω)

Output level (1kHz, 0dB) : 750Vrms \pm 2dB
 Frequency response : 20Hz-20kHz within 2dB
 S/N ratio (unwght) : $>$ 85dB (90dB typ.)
 S/N ratio (A-wght) : $>$ 88dB (95dB typ.)
 THD+N (1kHz, 0dB) : $<$ 0.2% (0.05% typ.)
 Channel crosstalk (1kHz) : $<$ -60dB (-70dB typ.)
 Channel crosstalk (10kHz) : $<$ -40dB (-50dB typ.)
 Channel unbalance (1kHz, 0dB) : $<$ 1dB

Optical output (not on all versions)

Connection : 3.5mm optical fiber jack
 Specification according to IEC958 (high accuracy mode).

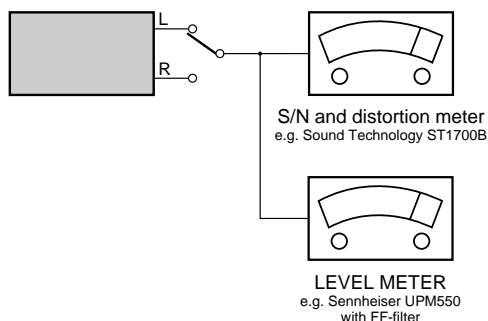
Laser

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

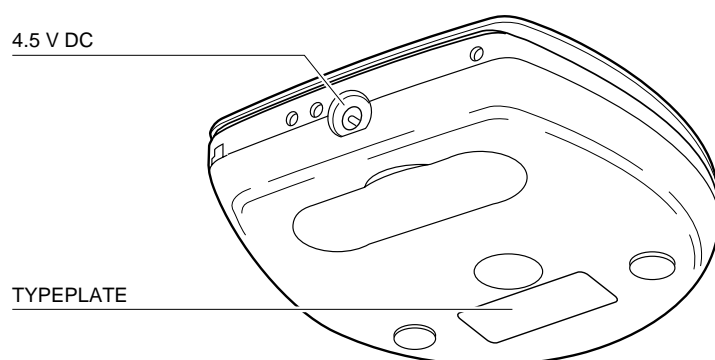
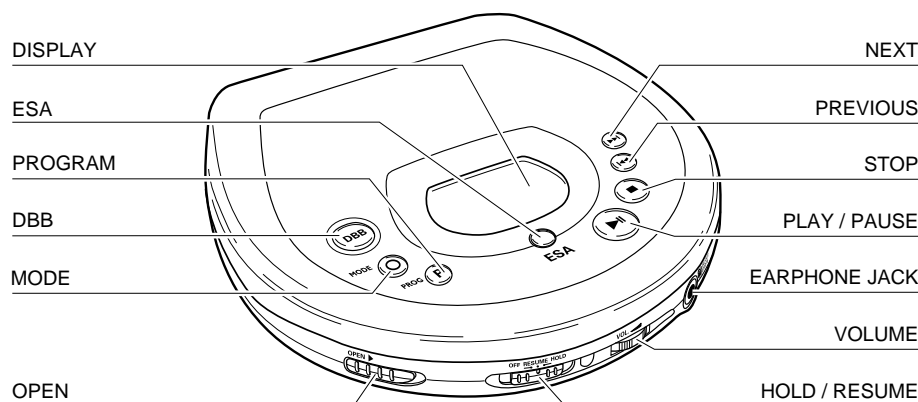
Measurement setup

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.
- OPEN.....opens the lid of the CD player
- ▶||.....starts and pauses CD play
- ESA.....Electronic Shock Absorption is the buffer memory for uninterrupted sound
- EARPHONE 📎Earphone socket (3.5mm)
- 4.5 V DCSocket for external power supply
- Battery compartment to insert batteries

FEATURES OF CD-PORTABLE FAMILY MABEL 3A, 4A	PLATFORM 3A			PLATFORM 4A		
	AZ7381	AZ7382	AZ7383	AZ7481	AZ7482	AZ7483
ELECTRONIC SHOCK ABSORPTION (ESA)	12sec.	12sec.	12sec.	25sec.	25sec.	25sec.
POWER SAVE MODE (PSM)	-	-	-	-	-	-
HOLD / RESUME FUNCTION	● / ●	● / ●	● / ●	● / ●	● / ●	● / ●
DBB STAGES	3	3	3	3	3	3
ACOUSTIC FEEDBACK	●	●	●	●	●	●
PROGRAM MEMORY	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				AZ7481	AZ7482		AZ7483		
		/00	/00	/05	/11	/14	/01	/05	/11	/17	/00	/00	/05	/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									
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							
AY3160/37A AC/DC ADAPTOR	4822 219 10182									X						X
AY3263/00 POUCH	4822 600 10765	O	O	O	O	O	O	O	O	O	O	X	X	O	O	O
AY3361/00 BATTERY PACK NiCd	4822 138 10615	O	X	X	X	X	X	X	X	O	O	X	X			O
AY3501/00 CAR ADAPTOR CASSETTE	4822 397 10059	O	O	O	O	O	X	X	X		O	O	O	O	O	
AY3501/37 CAR ADAPTOR CASSETTE	4822 397 10098									X						O
AY3545/00 CAR DC/DC CONVERTER	4822 219 10033		O	O	O	O	X	X	X		O	O	O	O	O	
AY3545/37 CAR DC/DC CONVERTER	4822 219 10183									X						O
AY3674/00 EARPHONE	4822 242 10842	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
AY3860/00 ACTIVE SPEAKER BOX	4822 445 10513	O	O	O	O	O	O	O	O		O	O	O	O	O	
AY3860/17 ACTIVE SPEAKER BOX	4822 445 10514									O						O
AY3464 HIFI CORD (3.5mm → cinch, L-plug)	4822 320 11881	O	O	O	O	O	O	O	O	O	X	X	X	O	O	O

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

SAFETY WARNINGS

Ⓒ **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 braceleterti d'une résistance de sécurité.

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

Ⓓ **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.



Ⓖ **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.

Ⓘ **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 del'apparecchio tramite un braccialetto a resistenza.

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

Ⓒ **AVAILABLE ESD PROTECTION EQUIPMENT :**

anti-static table mat large 1200x650x1.25mm
small 600x650x1.25mm

anti-static wristband

connection box (3 press stud connections, 1M Ω)

extendible cable (2m, 2M Ω , to connect wristband to connection box)

connecting cable (3m, 2M Ω , to connect table mat to connection box)

earth cable (1M Ω , to connect any product to mat or to connection box)

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

wristband tester

4822 466 10953

4822 466 10958

4822 395 10223

4822 320 11307

4822 320 11305

4822 320 11306

4822 320 11308

4822 310 10671

4822 344 13999

Ⓒ

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

Ⓓ

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

SAFETY



Ⓖ

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

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



Ⓔ **Varning !**

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

Ⓓ **Advarsel !**

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

Ⓕ **Varoitus !**

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

Ⓒ

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

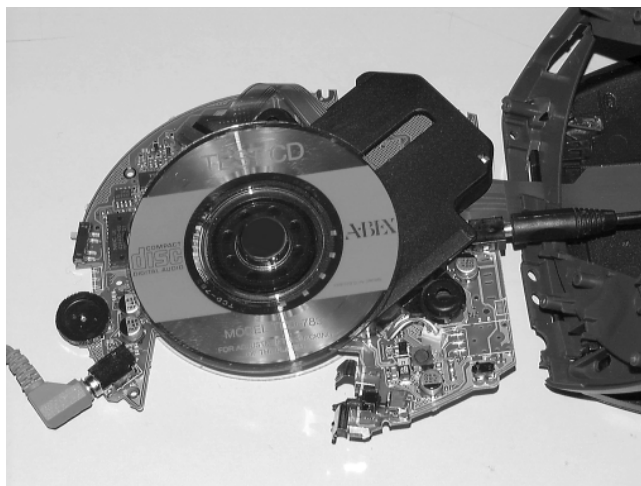


To get access to the copperside of the printed circuit board proceed as follows:

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

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

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

SERVICE TOOLS

Audio signal disc SBC429	4822 397 30184
Playability test disc SBC444	4822 397 30245
Test disc 5 (disc without errors) + Test disc 5A (disc with dropout errors, black spots and fingerprints) SBC426/SBC426A	4822 397 30096

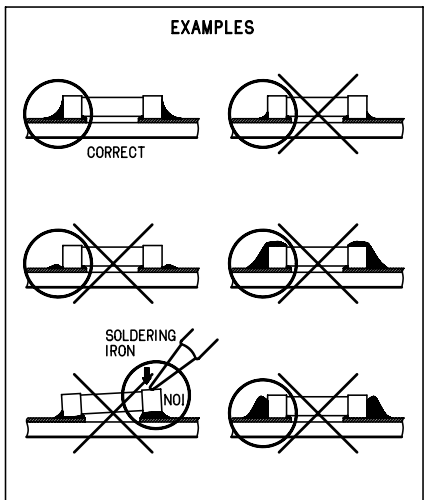
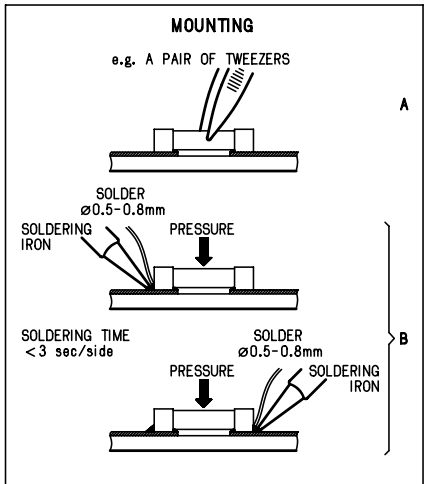
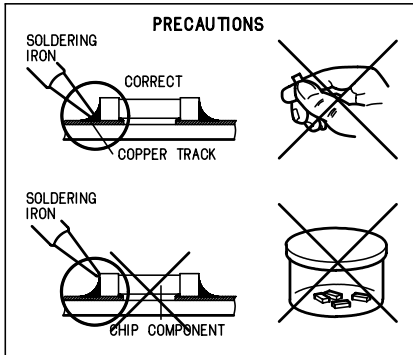
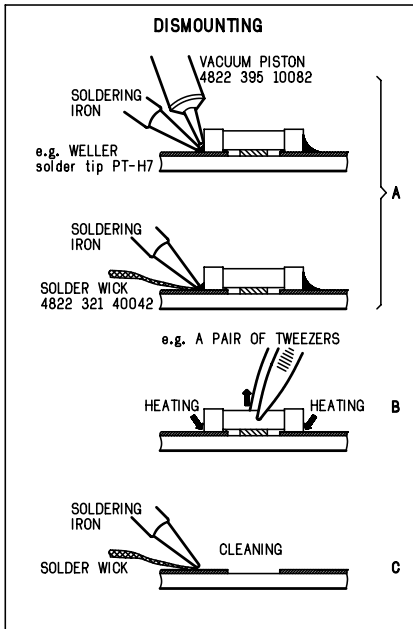
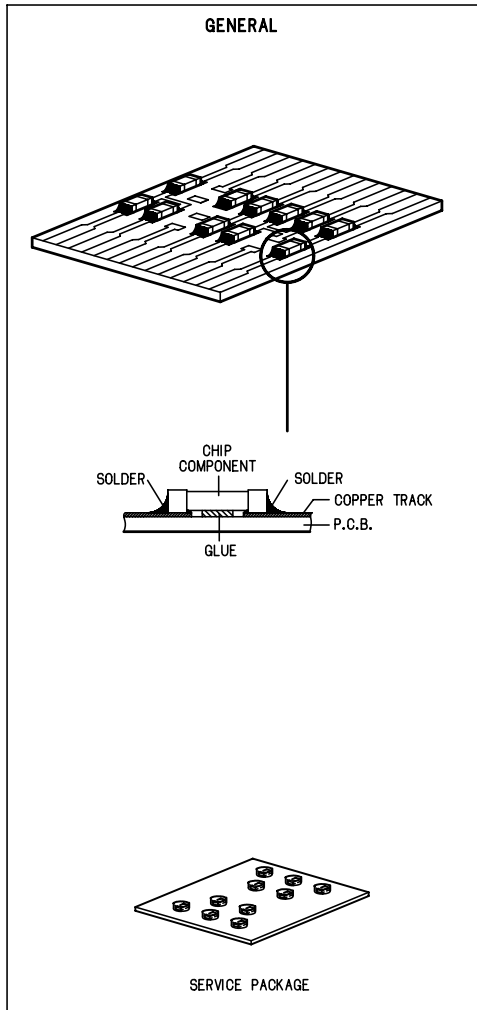
TRAINING MATERIAL

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

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, 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

HANDLING CHIP COMPONENTS



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 - 15"). 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.

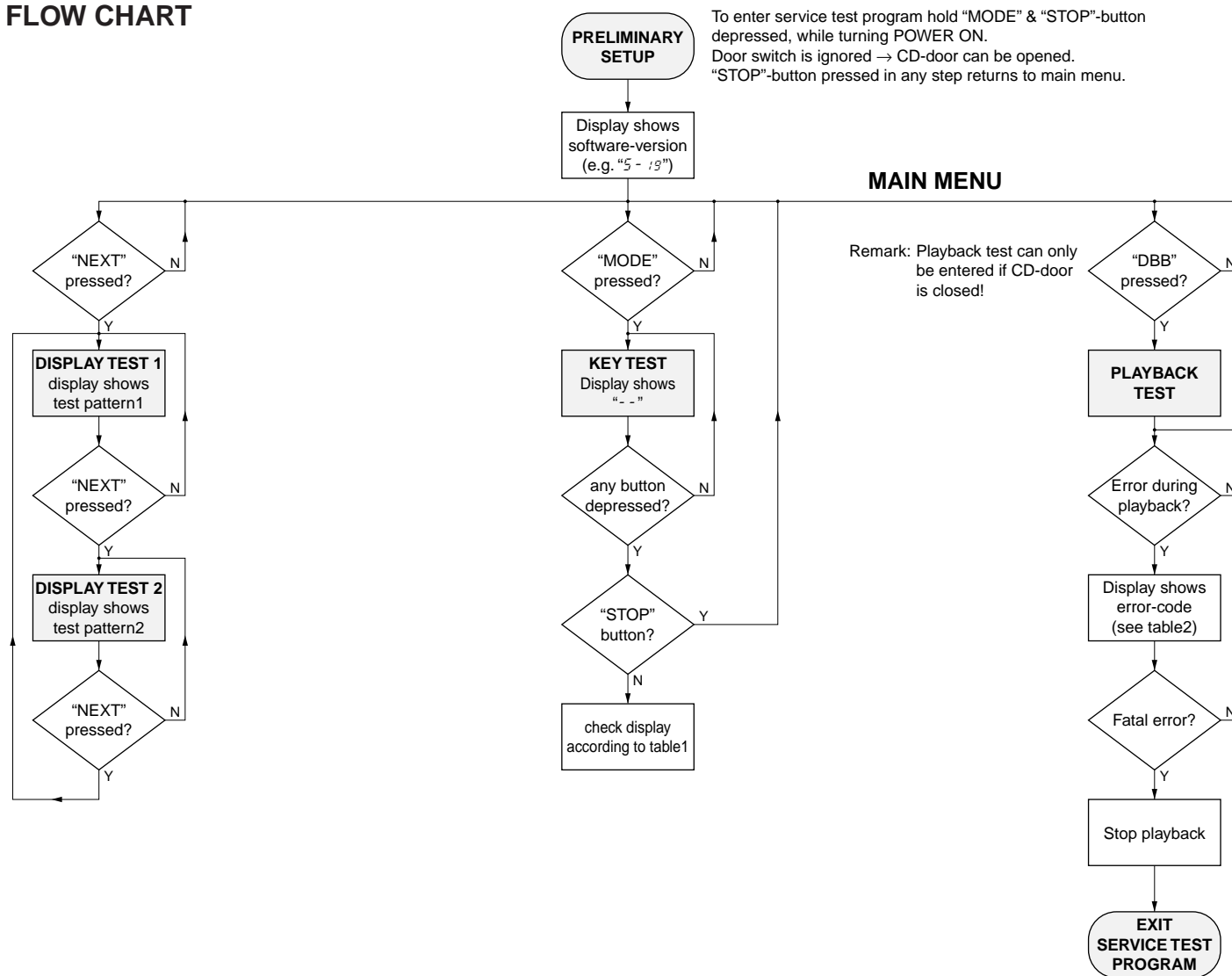
- The radial servo loop is switched on, mute is released and the audio signal is audible. If the system is on track the display shows " r", else "- r".
- In parallel also the disc speed (display " d" or "- d") and the state of the focus (display " F" or "- F") are monitored continuously.
- Note: In case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

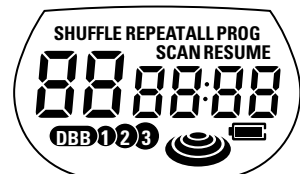
In radial test mode data to the DRAM is written at 1.2 times the nominal speed, and read from the DRAM at nominal speed. Because writing is done faster than reading the DRAM gets full after a certain time.

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

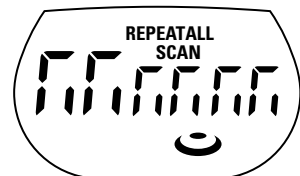


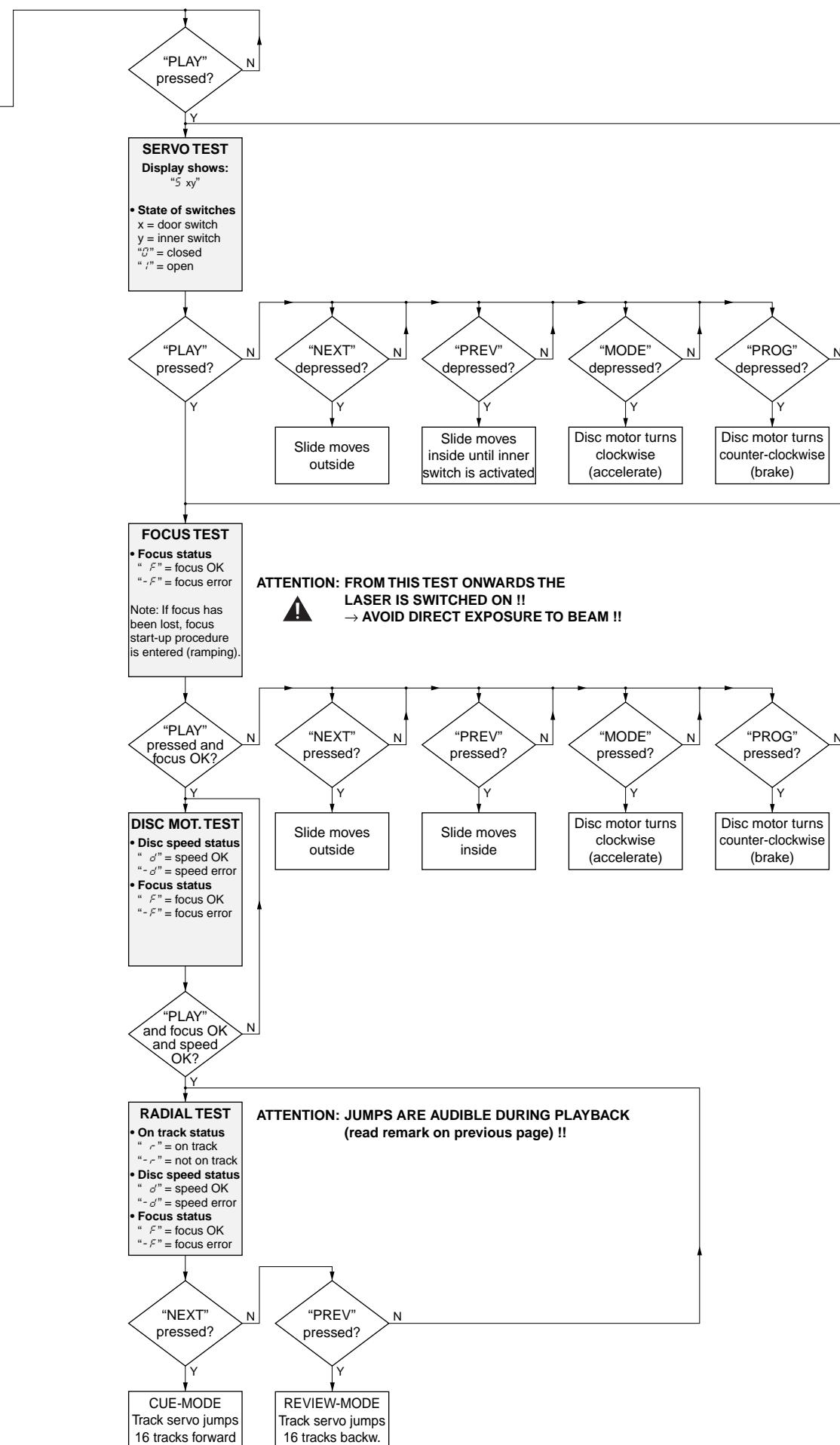
table1 - key test

KEYS OF SET	DISPLAY OF SET
PLAY	3
NEXT	5
PREVIOUS	6
ESA/ESP	2
MODE	7
PROGRAM	8
DBB	1

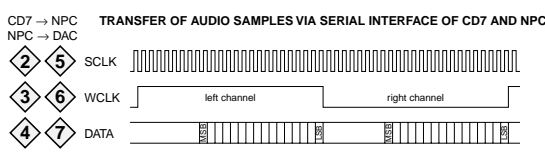
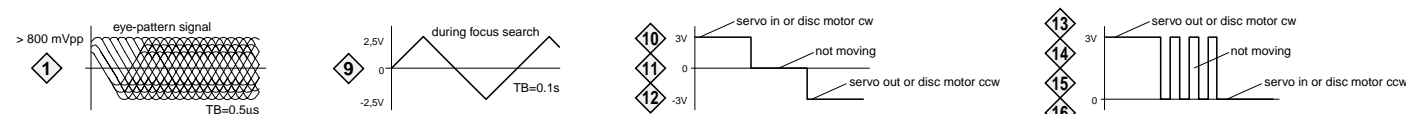
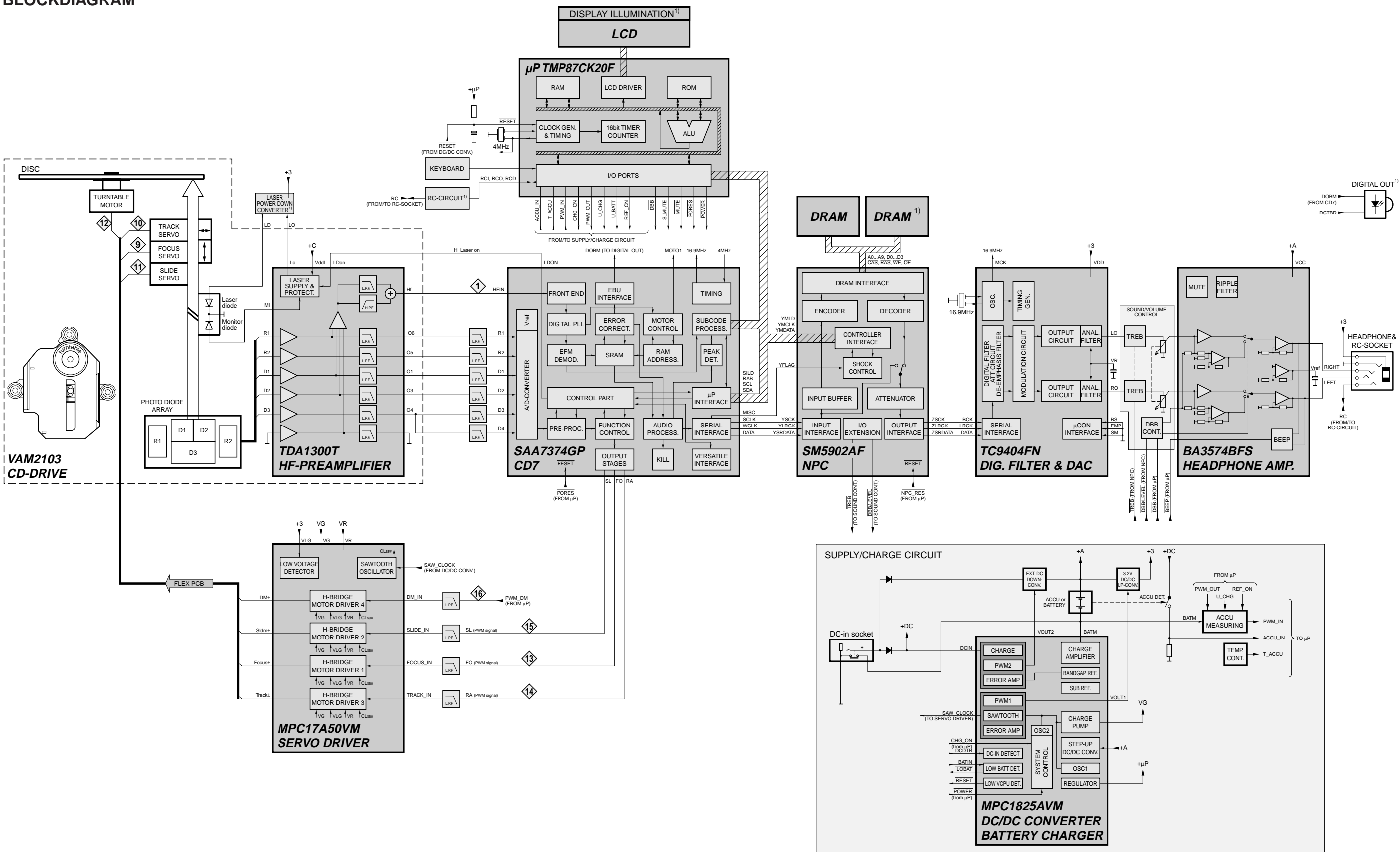
Press "STOP" on the CD-player to exit the key test.

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



1) not on all versions

START-UP PROCEDURE



PINNING OF INTEGRATED CIRCUITS

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

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
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	laser power control → HF-preamp	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	+3.5	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

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
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	GND A	GND	analog ground
7	VR	→ DAC	reference voltage input
8	GND A	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	GND D	GND	64fs/256fs/384fs system clock input
13	MCK	DAC →	master clock output
14	GND X	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	EMP (LATCH)	GND	serial control: data latch signal input for ATT;
19	EMP (SHIFT)	GND	parallel control: de-emphasis filter control input
20	SM (ATT)	GND	serial control: shift clock input for ATT;
20	SM (ATT)	GND	parallel control: soft mute control input
21	HS	+3	serial control: data input for ATT;
21	HS	+3	standard/double speed operation mode switching input
22	DATA	NPC → DAC	data input
23	BCK	NPC → DAC	bit clock input
24	LRCK	NPC → DAC	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	+C	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		reference output from ADC
12	VSSA2	GND	supply (analog) of CD7
13	SELPLL	+C	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	+C	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	+C	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 →	versatile output pin of CD7
42	V3	CD7 →	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	+C	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	+C	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	NPC ↔	μP interface extension I/O line 1
3	UC2	NPC ↔	μP interface extension I/O line 2
4	UC3	NPC ↔	μP interface extension I/O line 3
5	UC4	NPC ↔	μP interface extension I/O line 4
6	UC5	NPC ↔	μP interface extension I/O line 5
7	DIT	NPC → optical output	digital audio interface output
8	TEST2	+3	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	YBLKCK	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

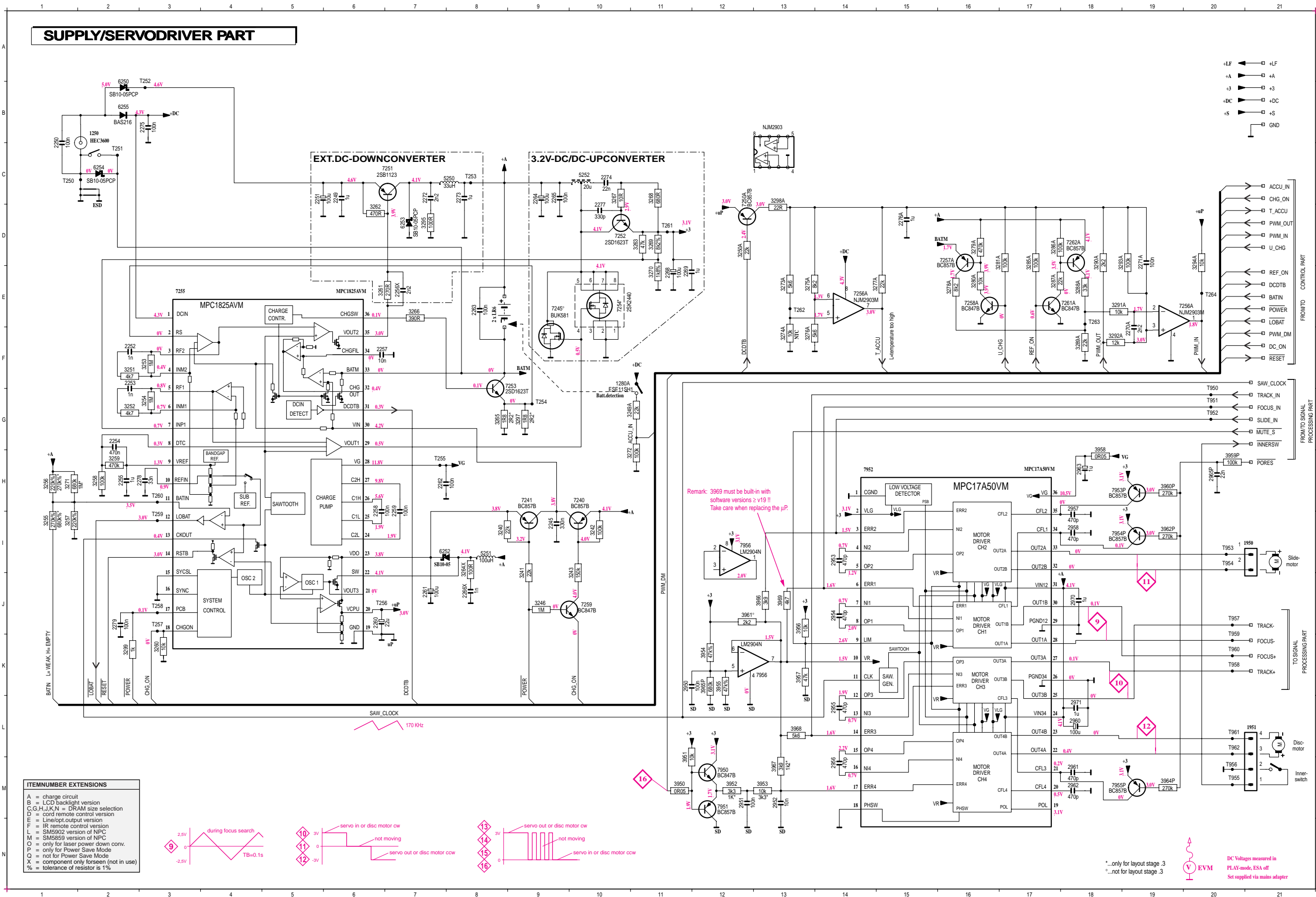
MPC17A50VM – 4-CHANNEL H-BRIDGE SERVODRIVER

<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

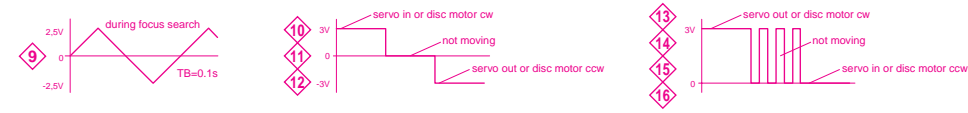
<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	DCIN	+DC	DC power supply input
2	RS	→ DC/DC converter	detection input of charge current (battery charger block)
3	RF2	→ DC/DC converter	connection of error amplifier feedback resistor (battery charger block)
4	INM2	→ DC/DC converter	inverting 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	VOUT3	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	VOUT1	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	VOUT2	DC/DC converter →	external driver control signal (battery charger voltage block)
36	CHGSW	DC/DC converter →	battery charger switch control output

SUPPLY/SERVODRIVER PART



ITEMNUMBER EXTENSIONS

- A = charge circuit
- B = LCD backlight version
- C, G, H, J, K, N = DRAM size selection
- D = cord remote control version
- E = Line/opt output version
- F = IR remote control version
- L = SM5802 version of NPC
- M = SM5859 version of NPC
- O = only for laser power down conv.
- P = only for Power Save Mode
- X = component only foreseen (not in use)
- % = tolerance of resistor is 1%

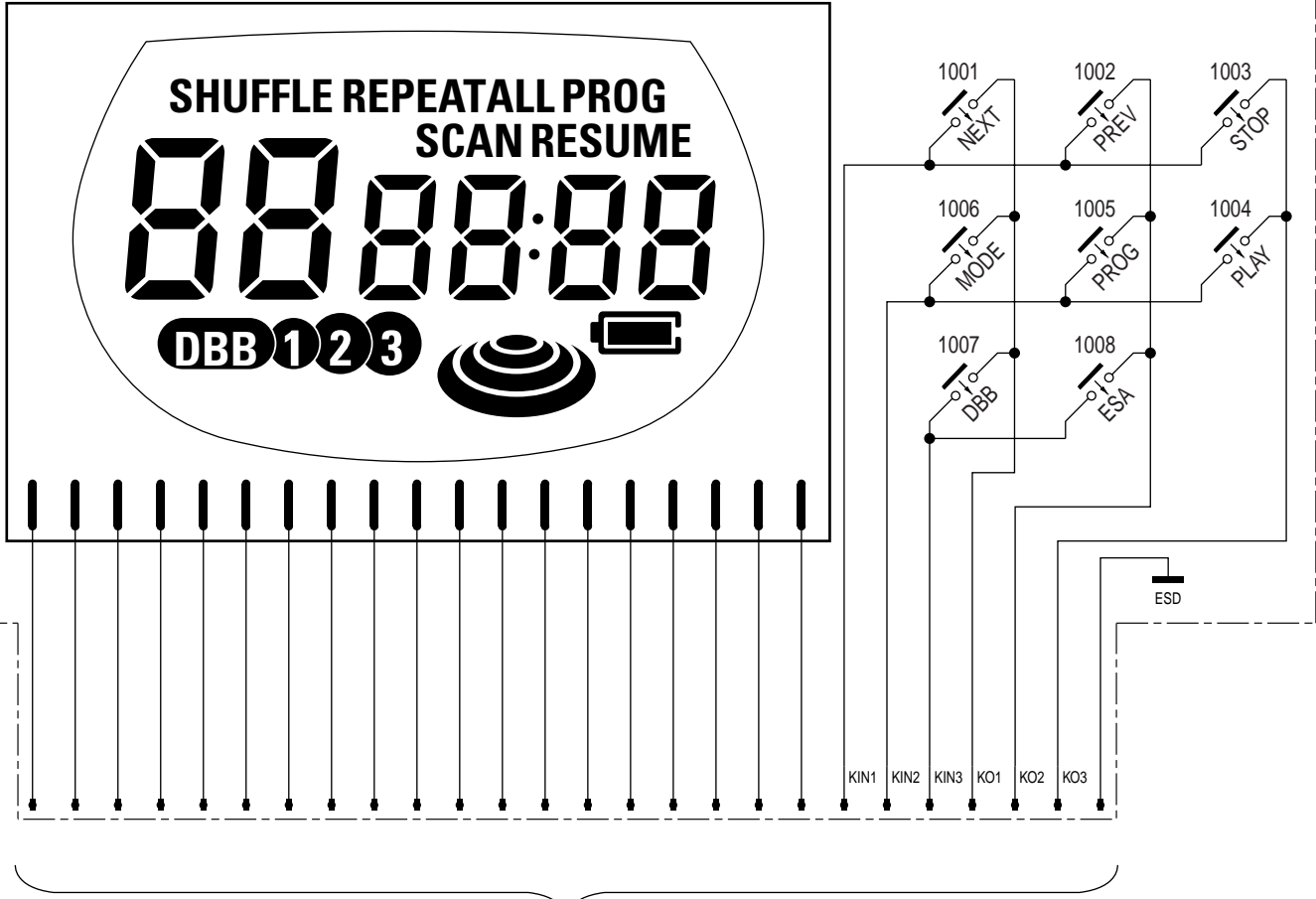


Remark: 3969 must be built-in with software versions > v19 !!
Take care when replacing the µP.

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

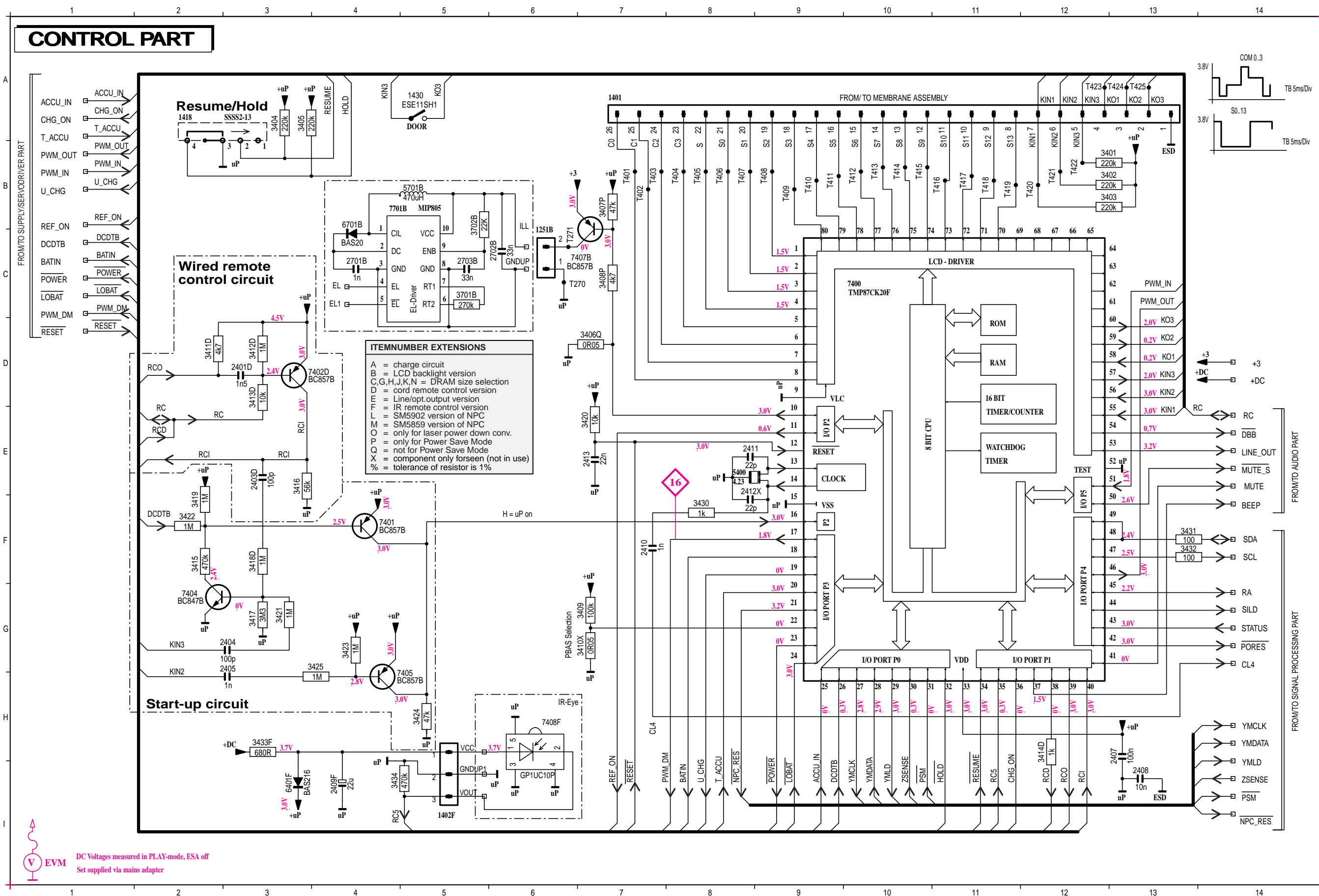
- 1250 B 2
- 1260 A F10
- 1350 C 2
- 1351 L 21
- 1352 A 3
- 1353 C 8
- 1354 G 9
- 1355 B 1
- 1356 C 5
- 1357 F 2
- 1358 F 2
- 1359 G 2
- 1360 H 2
- 1361 E 7
- 1362 F 6
- 1363 H 6
- 1364 C 9
- 1365 H 7
- 1366 J 6
- 1367 J 7
- 1368 E 8
- 1369 C 9
- 1370 J 8
- 1371 J 8
- 1372 C 8
- 1373 C 8
- 1374 C 10
- 1375 B 3
- 1376 A D15
- 1377 D 10
- 1378 H 3
- 1379 F 2
- 1380 K 11
- 1381 M 12
- 1382 H 13
- 1383 H 4
- 1384 J 4
- 1385 H 8
- 1386 H 8
- 1387 M 18
- 1388 M 18
- 1389 M 18
- 1390 M 18
- 1391 H 8
- 1392 H 8
- 1393 H 8
- 1394 H 8
- 1395 H 8
- 1396 H 8
- 1397 H 8
- 1398 H 8
- 1399 H 8
- 1400 H 8
- 1401 H 8
- 1402 H 8
- 1403 H 8
- 1404 H 8
- 1405 H 8
- 1406 H 8
- 1407 H 8
- 1408 H 8
- 1409 H 8
- 1410 H 8
- 1411 H 8
- 1412 H 8
- 1413 H 8
- 1414 H 8
- 1415 H 8
- 1416 H 8
- 1417 H 8
- 1418 H 8
- 1419 H 8
- 1420 H 8
- 1421 H 8
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- 1442 H 8
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- 1461 H 8
- 1462 H 8
- 1463 H 8
- 1464 H 8
- 1465 H 8
- 1466 H 8
- 1467 H 8
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- 1480 H 8
- 1481 H 8
- 1482 H 8
- 1483 H 8
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- 1485 H 8
- 1486 H 8
- 1487 H 8
- 1488 H 8
- 1489 H 8
- 1490 H 8
- 1491 H 8
- 1492 H 8
- 1493 H 8
- 1494 H 8
- 1495 H 8
- 1496 H 8
- 1497 H 8
- 1498 H 8
- 1499 H 8
- 1500 H 8

MEMBRANE ASSEMBLY 4822 360 10363



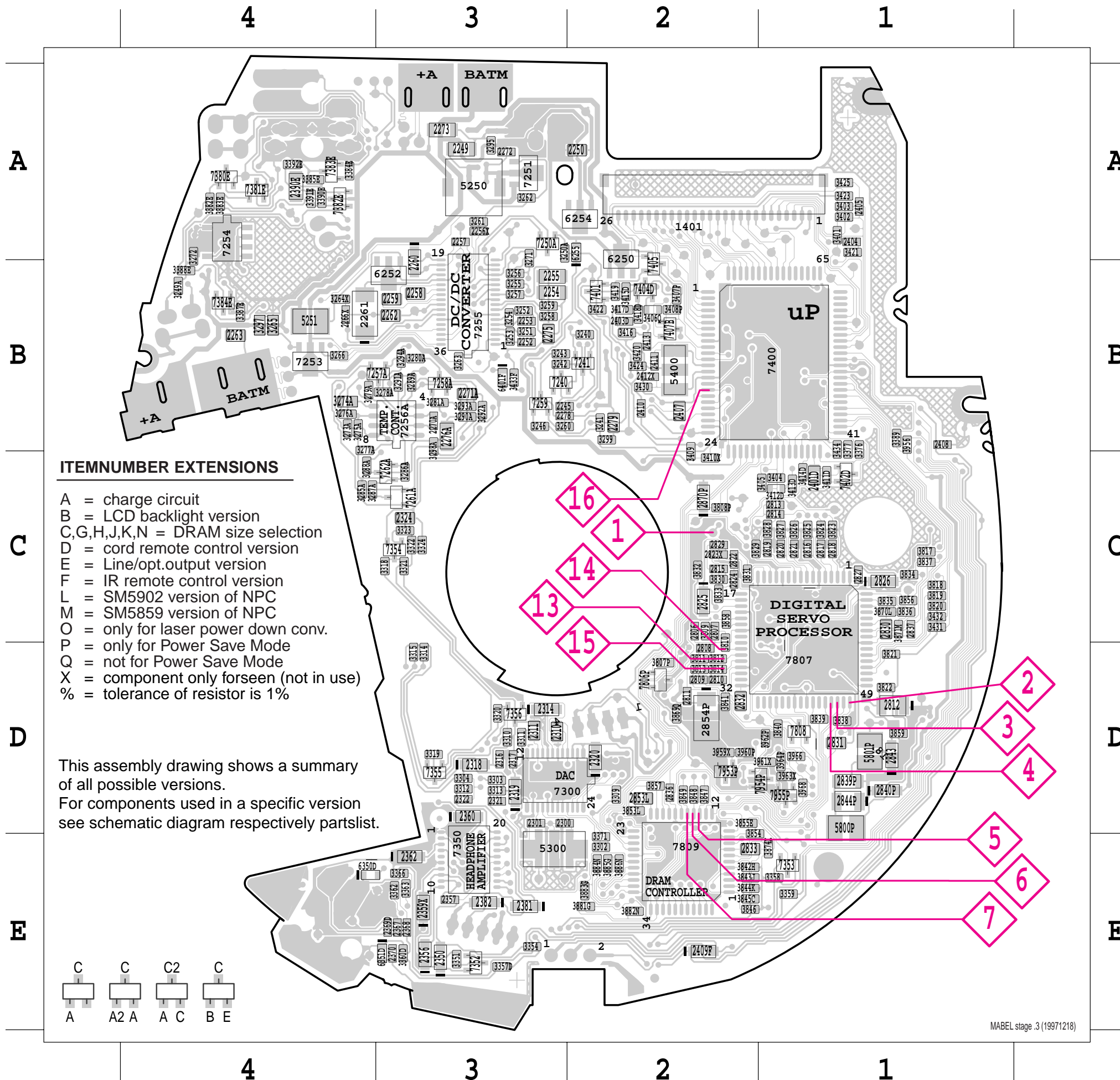
TO/FROM CONTROL PART / 1401

CONTROL PART



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

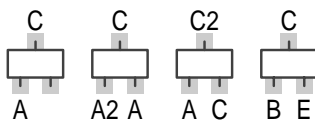
1251B C6
1401 A 7
1402F I5
1418 A 2
1430 A 5
2401D D3
2403D E3
2404 G 3
2405 G 3
2407 H13
2408 I13
2409F I4
2410 F 7
2411 E 8
2412X E 8
2413 E 7
2701B C 4
2702B C 6
2703B C 5
3401 B13
3402 B13
3403 B13
3404 A 3
3405 A 3
3406Q D 7
3407P B 7
3408P C 7
3409 G 7
3410X G 7
3411D D 2
3412D D 3
3413D D 3
3414D H12
3415 F 2
3416 E 3
3417 G 3
3418D F 3
3419 F 2
3420 E 7
3421 G 3
3422 F 2
3423 G 4
3424 H 5
3425 G 4
3430 F 8
3431 F13
3432 F13
3433F H 3
3434 I 4
3701B C 5
3702B B 5
5400 E 8
5701B B 5
6401F I 3
6701B B 4
7400 C10
7401 F 4
7402D D 3
7404 G 2
7405 H 4
7407B C 7
7701B B 4
T270 C 7
T271 C 6
T401 B 7
T402 B 7
T403 B 7
T404 B 8
T405 B 8
T406 B 8
T407 B 8
T408 B 9
T409 B 9
T410 B 9
T411 B 9
T412 B10
T413 B10
T414 B10
T415 B10
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T420 B12
T421 B12
T422 B12
T423 A12
T424 A12
T425 A13



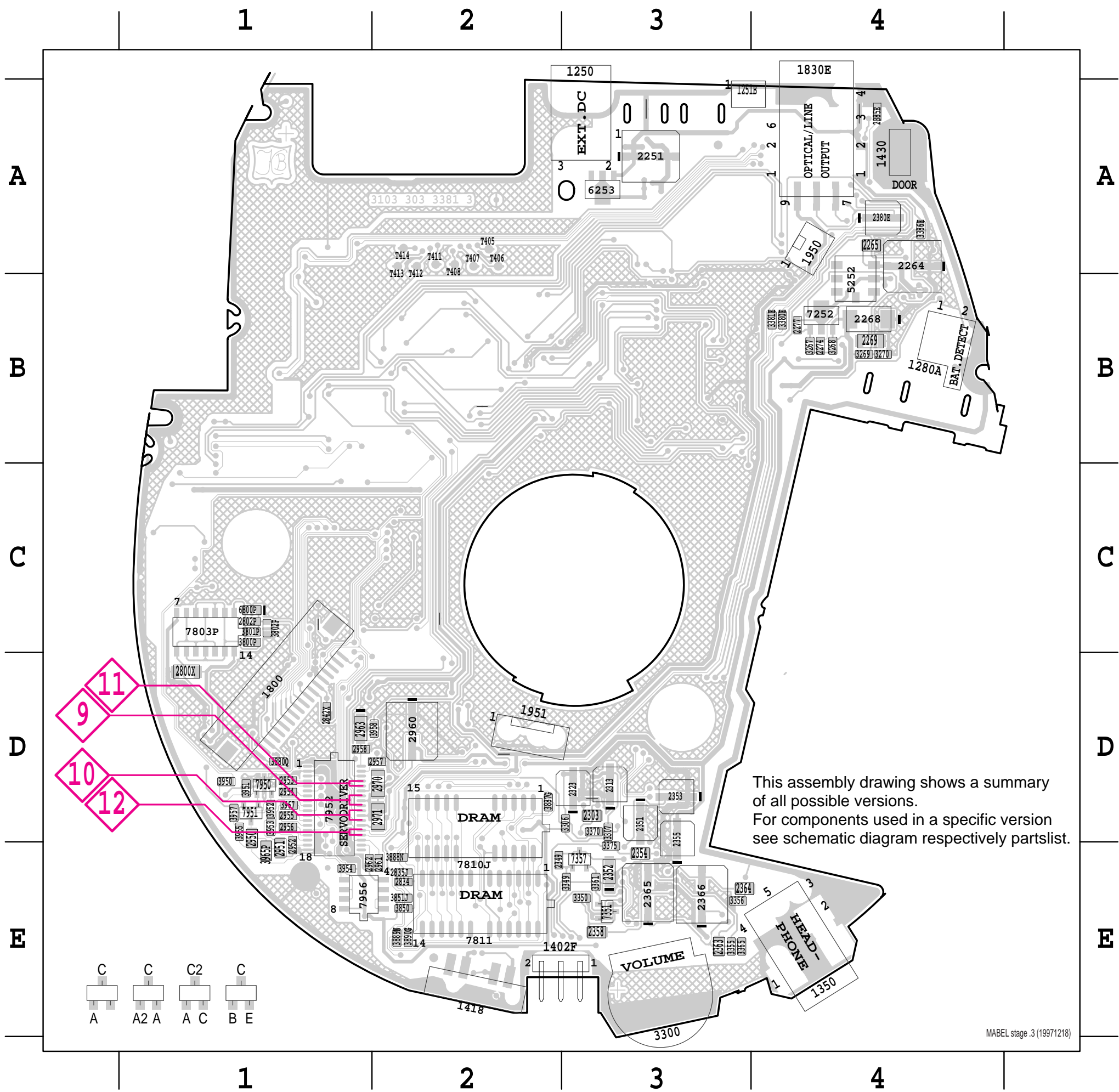
ITEMNUMBER EXTENSIONS

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- M = SM5859 version of NPC
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- Q = not for Power Save Mode
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- % = tolerance of resistor is 1%

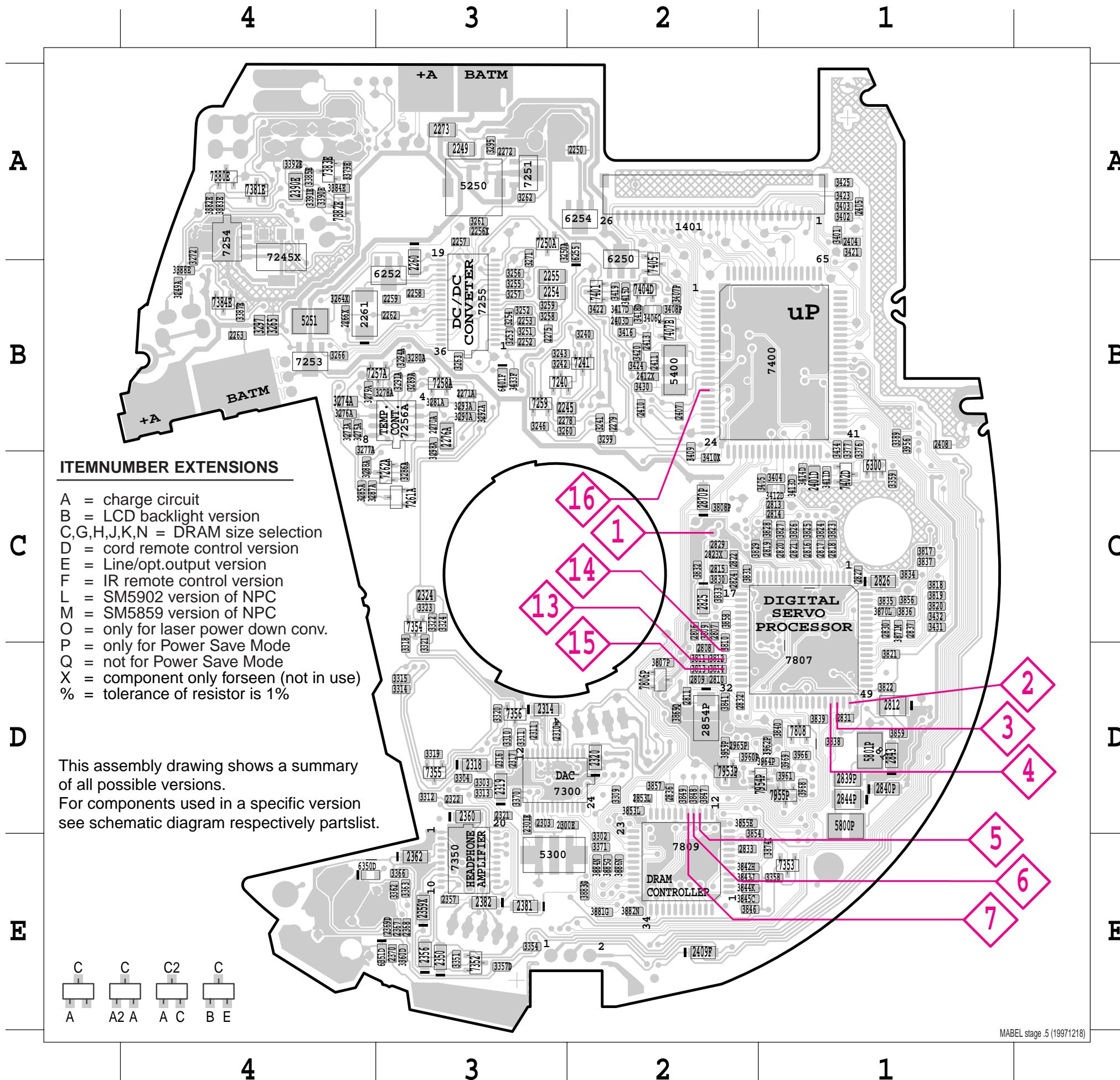
This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram respectively partslist.



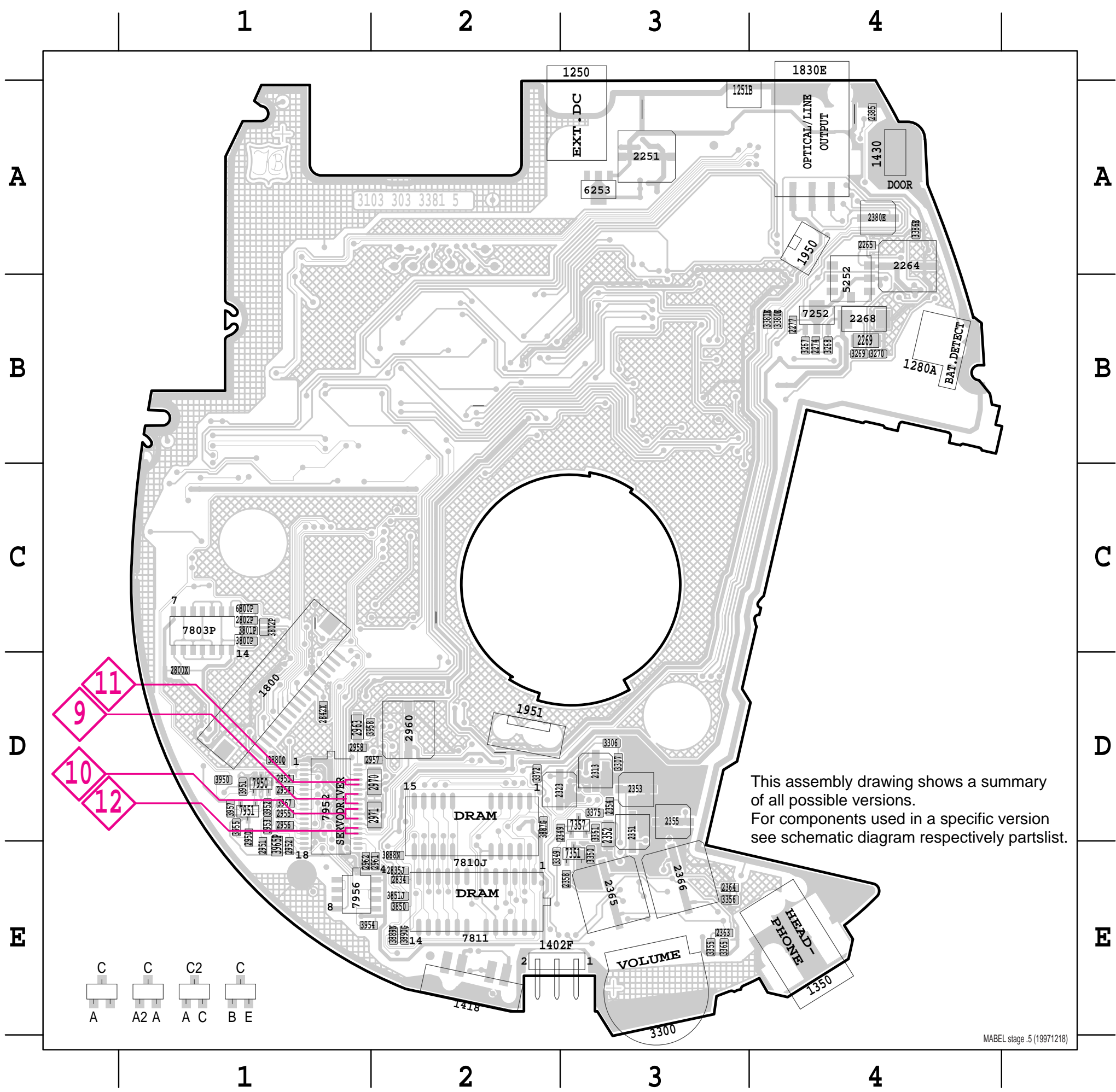
1401 A 2	2823X C 2	3320 D 3	3831 C 2	7381E A 4
2245 B 3	2824 C 2	3321 C 3	3832 C 2	7382E A 4
2249 A 3	2825 C 2	3322 C 3	3833 C 2	7383E A 4
2250 A 2	2826 C 1	3323 C 3	3834 C 1	7384E B 4
2252 B 3	2827 C 1	3324 C 3	3835 C 1	7400 B 1
2253 B 3	2829 C 2	3351 E 3	3836 C 1	7401 B 2
2254 B 3	2830 C 1	3354 E 3	3837 C 1	7402D C 1
2255 B 3	2831 D 1	3357D E 3	3838 D 1	7404 B 2
2256X A 3	2832 D 2	3358 E 1	3839 D 1	7405 B 2
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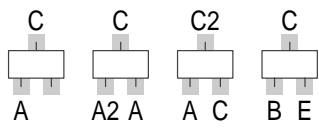
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1951 D 2	3370 D 3
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2952 E 1	7351 E 3
2953 D 1	7357 E 3
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2955 D 1	7803P C 1
2956 D 1	7810J D 2
2957 D 2	7811 E 2
2958 D 1	7950 D 1
2960 D 2	7951 D 1
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2970 D 2	
2971 D 2	
3267 B 4	
3268 B 4	
3269 B 4	



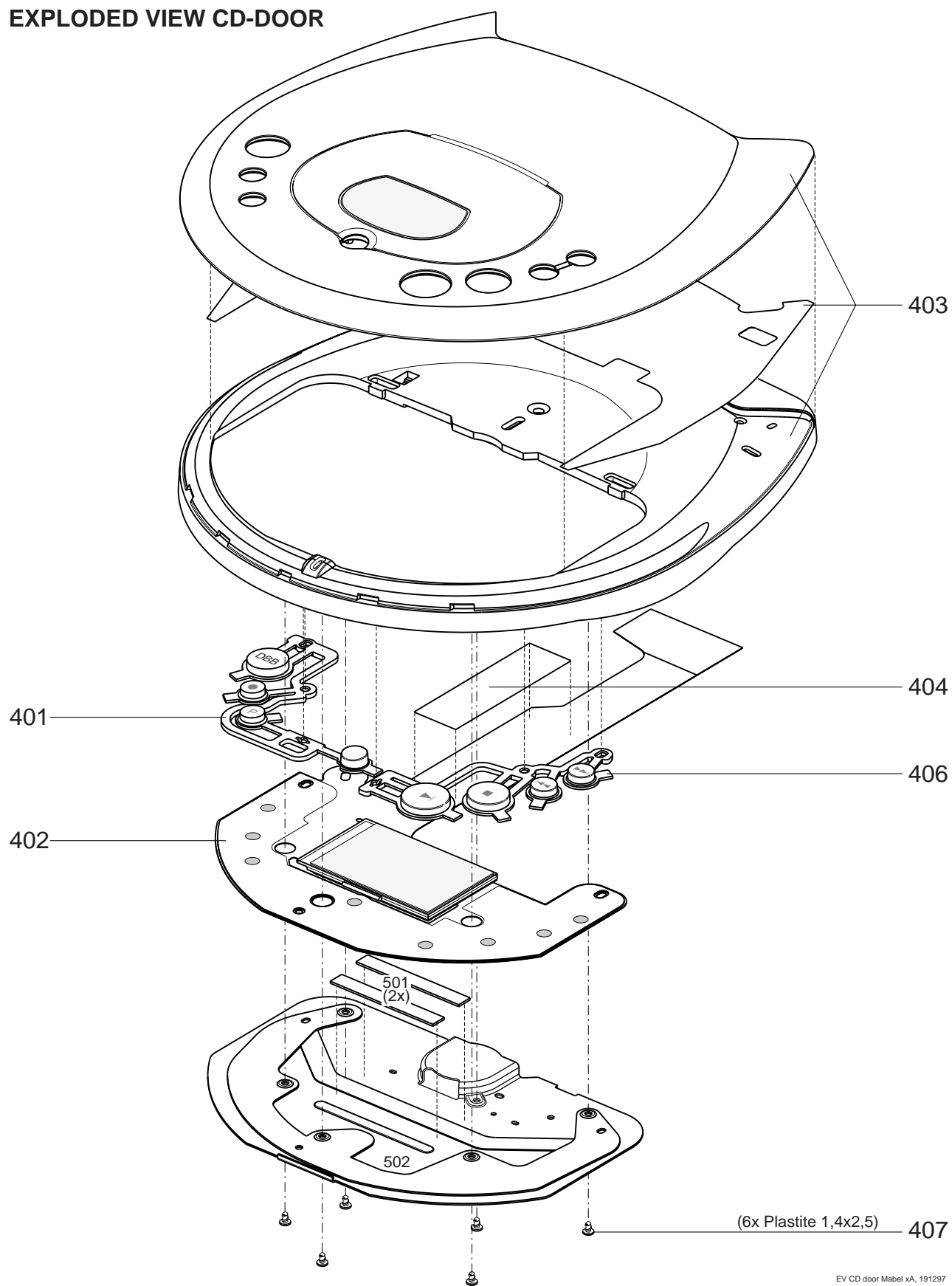
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2250	A	2	2825	C	2	3321	D	3	3830	C	2	7355	D	3
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2316	D	3	3254	B	3	3401	A	1	3870L	C	1			
2317	D	3	3255	B	3	3402	A	1	3871M	C	1			
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2321	D	3	3259	B	3	3406Q	B	2	3883G	E	2			
2322	D	3	3260	B	3	3407P	B	2	3884N	E	2			
2324	C	3	3261	A	3	3408P	B	2	3885G	E	2			
2350	E	3	3262	A	3	3409	C	2	3886N	E	2			
2356	E	3	3263	B	3	3410X	C	2	3956	B	1			
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2362	E	3	3271	A	3	3414D	C	1	3962P	D	1			
2367	E	3	3272	A	4	3415	B	2	3964P	D	1			
2368	E	3	3273A	B	4	3416	B	2	3966	D	1			
2369D	E	3	3274A	B	4	3417	B	2	3968	D	1			
2370	E	3	3275A	B	4	3418D	B	2	3969	D	1			
2381	E	3	3276A	B	4	3419	B	2	5250	A	3			
2382	E	3	3277A	B	4	3420	B	2	5251	B	4			
2390E	A	4	3278A	B	3	3421	A	1	5300	E	3			
2401D	C	1	3279A	B	4	3422	B	2	5400	B	2			
2403D	B	2	3280A	B	3	3423	A	1	5800P	D	1			
2404	A	1	3281A	B	3	3424	B	2	5801P	D	1			
2405	A	1	3285A	C	4	3425	A	1	6250	B	2			
2407	B	2	3286A	C	3	3430	B	2	6252	B	3			
2408	B	1	3287A	C	4	3431	C	1	6254	A	2			
2409F	E	2	3288A	C	4	3432	C	1	6255	A	2			
2410	B	2	3289A	B	3	3433F	B	3	6300	C	1			
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2412X	B	2	3291A	B	3	3807P	D	2	6351D	E	3			
2413	B	2	3292A	B	3	3808P	C	2	6401F	B	3			
2806	C	2	3293A	B	3	3809	C	2	7240	B	3			
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2820	C	1	3314	D	3	3825	C	1	7300	D	3			
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1250 A 3	3270 B 4
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1280A B 4	3306 D 3
1350 E 4	3307 D 3
1402F E 3	3349 E 2
1418 E 2	3350 E 3
1430 A 4	3355 E 3
1800 D 1	3356 E 3
1830E A 4	3361 D 3
1950 A 4	3365 E 3
1951 D 2	3372 D 2
2251 A 3	3375 D 3
2264 A 4	3380E B 4
2265 A 4	3381E B 4
2268 B 4	3386E A 4
2269 B 4	3800P C 1
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2323 D 2	3851J E 2
2349 D 3	3880Q D 1
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2363 E 3	3952 D 1
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2802P C 1	3967 D 1
2834 E 2	5252 B 4
2835J E 2	6253 A 3
2842X D 1	6800P C 1
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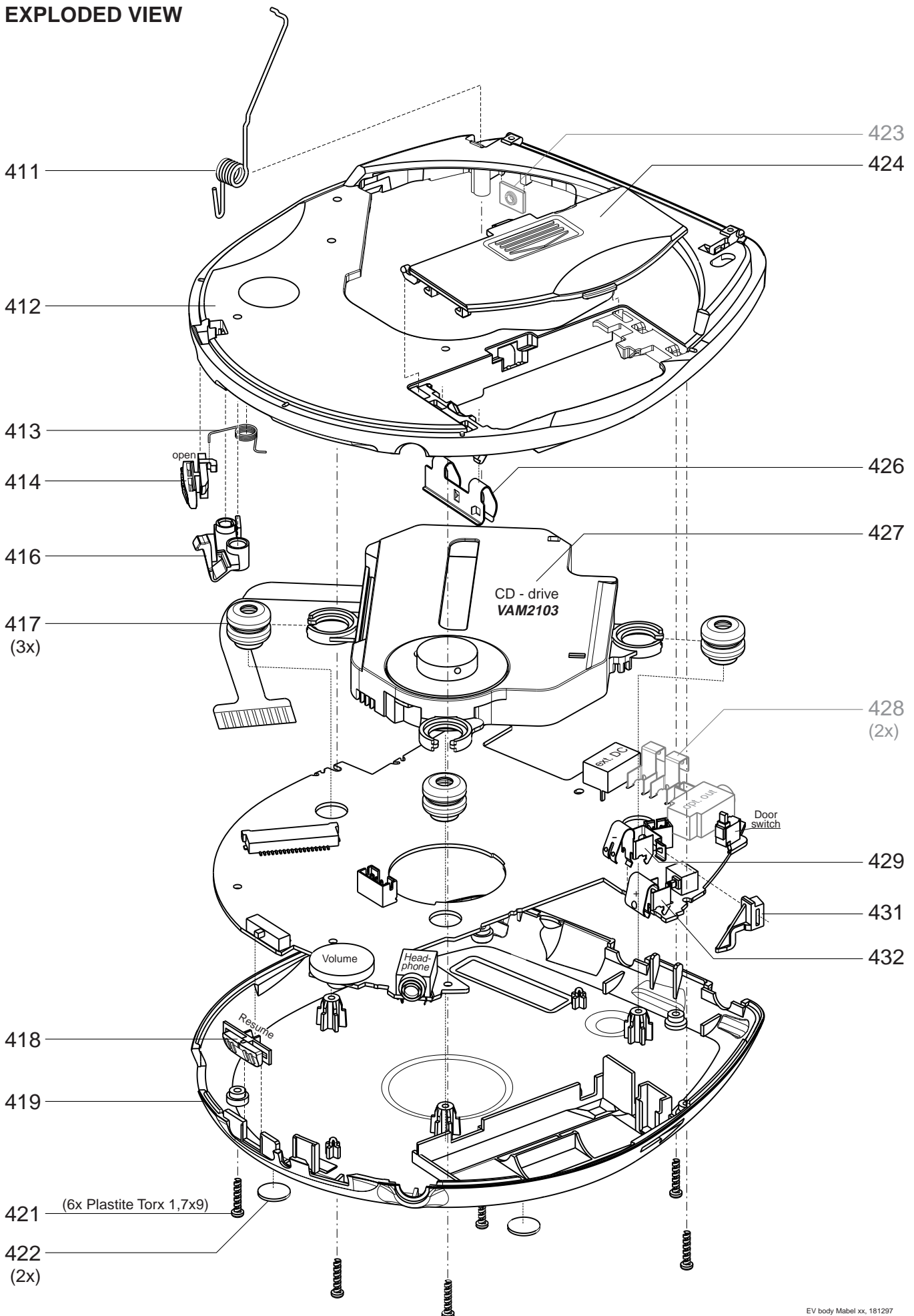


EXPLODED VIEW CD-DOOR



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 +

ELECTRICAL PARTSLIST

MISCELLANEOUS

1250	4822 265 10626	SOCKET, EXT. SUPPLY
1280	4822 276 13695	SWITCH, BATT. DETECTION
1350	4822 267 41192	HEADPHONE&RC-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

2245	© 4822 126 12102	330nF	20%	50V
2249	© 4822 123 14042	1µF	10%	16V
2250	© 4822 126 14305	100nF	10%	16V
2251	© 4822 124 11519	100µF	20%	10V
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 12107	22µF	20%	4V
2261	© 4822 124 12108	100µF	20%	4V
2262	© 4822 126 14305	100nF	10%	16V
2263	© 4822 126 14305	100nF	10%	16V
2264	© 4822 124 11519	100µF	20%	10V
2265	© 4822 126 14305	100nF	10%	16V
2268	© 4822 124 12108	100µF	20%	4V
2269	© 4822 123 14042	1µF	10%	16V
2270	© 4822 126 14238	2,2nF		50V
2271	© 4822 126 14305	100nF	10%	16V
2272	© 4822 126 14238	2,2nF		50V
2273	© 4822 123 14042	1µF	10%	16V
2274	© 4822 126 14239	22nF		25V
2275	© 4822 126 14305	100nF	10%	16V
2276	© 4822 123 14042	1µF	10%	16V
2277	© 4822 126 14241	330pF		50V
2278	© 4822 126 14242	33nF		16V
2279	© 4822 126 14305	100nF	10%	16V
2303	© 4822 126 14305	100nF	10%	16V
2310	© 4822 126 14305	100nF	10%	16V
2311	© 4822 126 14305	100nF	10%	16V
2313	© 4822 124 81058	47µF	20%	4V
2314	© 4822 124 11348	2,2µF	20%	10V
2316	© 4822 126 14238	2,2nF		50V
2317	© 4822 126 14238	2,2nF		50V
2318	© 4822 124 12109	10µF	20%	4V
2319	© 4822 124 12109	10µF	20%	4V
2320	© 4822 124 12107	22µF	20%	4V
2321	© 4822 126 14247	1,5nF		50V
2322	© 4822 126 14247	1,5nF		50V
2323	© 4822 124 81058	47µF	20%	4V
2324	© 4822 126 12102	330nF	20%	50V
2324	© 5322 124 10798	1µF	20%	16V
2349	© 4822 126 14242	33nF		16V
2350	© 4822 124 12107	22µF	20%	4V
2351	© 4822 124 81061	22µF	20%	6,3V
2352	© 5322 124 10798	1µF	20%	16V
2353	© 4822 124 81061	22µF	20%	6,3V
2354	© 4822 126 14305	100nF	10%	16V
2355	© 4822 124 81061	22µF	20%	6,3V
2356	© 5322 124 10798	1µF	20%	16V
2357	© 4822 126 14305	100nF	10%	16V

not for stage .3
only for stage .3

not for stage .3

CAPACITORS

2357	4822 126 14242	33nF	16V	only for stage .3
2358	4822 126 14305	100nF 10%	16V	
2360	5322 124 10798	1µF 20%	16V	
2362	4822 124 11348	2,2µF 20%	10V	
2363	4822 126 14305	100nF 10%	16V	
2364	4822 126 14305	100nF 10%	16V	
2365	4822 124 80352	330µF 20%	6,3V	not for stage .3
2365	4822 124 81059	220µF 20%	6,3V	only for stage .3
2366	4822 124 80352	330µF 20%	6,3V	not for stage .3
2366	4822 124 81059	220µF 20%	6,3V	only for stage .3
2367	4822 126 14242	33nF	16V	
2368	4822 126 14242	33nF	16V	
2370	4822 126 14243	330pF	50V	
2381	4822 124 11348	2,2µF 20%	10V	
2382	4822 124 11348	2,2µF 20%	10V	
2385	4822 126 14241	330pF	50V	
2404	4822 126 14244	100pF	50V	
2405	5322 126 11578	1nF 10%	63V	
2407	4822 126 14305	100nF 10%	16V	
2408	4822 123 14045	10nF 10%	50V	
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 12111	47µF 20%	4V	
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 12107	22µF 20%	4V	
2853	4822 126 14305	100nF 10%	16V	
2854	4822 124 12108	100µF 20%	4V	
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	
2955	4822 126 14245	470pF	50V	
2956	4822 126 14245	470pF	50V	
2957	4822 126 14245	470pF	50V	
2958	4822 126 14245	470pF	50V	

CAPACITORS

2960	4822 124 11519	100µF 20%	10V
2961	4822 126 14245	470pF	50V
2962	4822 126 14245	470pF	50V
2963	5322 124 10798	1µF 20%	16V
2970	4822 123 14042	1µF 10%	16V

2971	4822 123 14042	1µF 10%	16V
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RESISTORS

3240	4822 117 12883	22kΩ	5% 0,0625W
3241	4822 117 12883	22kΩ	5% 0,0625W
3242	4822 117 12884	100kΩ	5% 0,0625W
3243	4822 117 12885	150kΩ	5% 0,0625W
3246	4822 117 12887	1MΩ	5% 0,0625W
3249	4822 117 12883	22kΩ	5% 0,0625W
3250	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 12889	270kΩ	1% 0,0625W
3255	4822 117 12901	680Ω	5% 0,0625W
3256	4822 117 12891	220kΩ	1% 0,0625W
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 117 12894	270Ω	5% 0,0625W
3262	4822 117 12895	470Ω	5% 0,0625W
3263	4822 117 12896	47kΩ	5% 0,0625W
3265	4822 051 20188	1,8Ω	5% 0,1W
3265	4822 051 20228	2,2Ω	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 12888	680kΩ	5% 0,0625W
3271	4822 117 12887	1MΩ	5% 0,0625W
3272	4822 117 12884	100kΩ	5% 0,0625W
3273	4822 117 12904	5,6kΩ	5% 0,0625W
3274	4822 116 30467	10kΩ	5% NTC
3275	4822 117 12905	8,2kΩ	5% 0,0625W
3276	4822 117 12904	5,6kΩ	5% 0,0625W
3277	4822 117 12883	22kΩ	5% 0,0625W
3278	4822 117 12905	8,2kΩ	5% 0,0625W
3279	4822 117 12892	470kΩ	5% 0,0625W
3280	4822 117 12893	10kΩ	5% 0,0625W
3281	4822 117 12884	100kΩ	5% 0,0625W
3285	4822 117 12884	100kΩ	5% 0,0625W
3286	4822 117 12884	100kΩ	5% 0,0625W
3287	4822 117 12883	22kΩ	5% 0,0625W
3288	4822 117 12907	33kΩ	5% 0,0625W
3289	4822 117 12883	22kΩ	5% 0,0625W
3290	4822 117 12908	2,2kΩ	5% 0,0625W
3291	4822 117 12893	10kΩ	5% 0,0625W
3292	4822 117 12909	12kΩ	5% 0,0625W
3293	4822 117 12884	100kΩ	5% 0,0625W
3294	4822 117 12893	10kΩ	5% 0,0625W
3295	4822 117 12911	100Ω	5% 0,0625W
3297	4822 051 20188	1,8Ω	5% 0,1W
3297	4822 051 20228	2,2Ω	5% 0,1W
3298	4822 117 12912	22Ω	5% 0,0625W

not for stage .3

only for stage .3

not for stage .3

only for stage .3

not for stage .3

only for stage .3

not for stage .3

only for stage .3

not for stage .3

only for stage .3

RESISTORS

3299	© 4822 117 12913	1kΩ	5% 0,0625W
3300	© 4822 101 11866	2x10kΩ	POTMETER
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 117 12911	100Ω	5% 0,0625W
3307	© 4822 117 12911	100Ω	5% 0,0625W
3309	© 4822 117 12911	100Ω	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 12886	4,7kΩ	5% 0,0625W
3315	© 4822 117 12886	4,7kΩ	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 12895	470Ω	5% 0,0625W
3359	© 4822 117 12913	1kΩ	5% 0,0625W
3361	© 4822 117 12884	100kΩ	5% 0,0625W
3362	© 4822 117 12917	1Ω	5% 0,0625W
3363	© 4822 117 12917	1Ω	5% 0,0625W
3365	© 4822 117 12918	330Ω	5% 0,0625W
3366	© 4822 117 12918	330Ω	5% 0,0625W
3370	© 4822 117 12913	1kΩ	5% 0,0625W
3371	© 4822 117 12911	100Ω	5% 0,0625W
3372	© 4822 117 12911	100Ω	5% 0,0625W
3375	© 4822 051 30008	CHIP JUMPER 0603	not used in stage .3
3375	© 4822 117 12883	22kΩ	5% 0,0625W
3376	© 4822 117 12892	470kΩ	5% 0,0625W
3376	© 4822 117 12884	100kΩ	5% 0,0625W
3377	© 4822 117 12892	470kΩ	5% 0,0625W
3377	© 4822 117 12884	100kΩ	5% 0,0625W
3389	© 4822 117 12883	22kΩ	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
3406	© 4822 051 30008	CHIP JUMPER 0603	only for stage .3
3409	© 4822 117 12884	100kΩ	5% 0,0625W
3415	© 4822 117 12892	470kΩ	5% 0,0625W
3416	© 4822 117 12906	56kΩ	5% 0,0625W
3417	© 4822 117 12921	3,3MΩ	5% 0,0625W
3419	© 4822 117 12887	1MΩ	5% 0,0625W
3420	© 4822 117 12893	10kΩ	5% 0,0625W
3421	© 4822 117 12887	1MΩ	5% 0,0625W
3422	© 4822 117 12887	1MΩ	5% 0,0625W
3423	© 4822 117 12887	1MΩ	5% 0,0625W
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

RESISTORS

3434	© 4822 117 12892	470kΩ	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
3835	© 4822 117 12883	22kΩ	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
3840	© 4822 117 12896	47kΩ	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 12912	22Ω	5% 0,0625W
3847	© 4822 117 12911	100Ω	5% 0,0625W
3848	© 4822 117 12911	100Ω	5% 0,0625W
3849	© 4822 117 12911	100Ω	5% 0,0625W
3850	© 4822 117 12923	4,7Ω	5% 0,0625W
3851	© 4822 117 12923	4,7Ω	5% 0,0625W
3853	© 4822 117 12912	22Ω	5% 0,0625W
3854	© 4822 051 30008	CHIP JUMPER 0603	
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
3869	© 4822 051 30008	CHIP JUMPER 0603	
3870	© 4822 117 12896	47kΩ	5% 0,0625W
3880	© 4822 051 30008	CHIP JUMPER 0603	
3881	© 4822 051 30008	CHIP JUMPER 0603	
3883	© 4822 051 30008	CHIP JUMPER 0603	
3885	© 4822 051 30008	CHIP JUMPER 0603	
3887	© 4822 051 30008	CHIP JUMPER 0603	
3890	© 4822 051 30008	CHIP JUMPER 0603	
3950	© 4822 051 30008	CHIP JUMPER 0603	
3951	© 4822 117 12893	10kΩ	5% 0,0625W
3952	© 4822 117 12924	3,3kΩ	5% 0,0625W
3952	© 4822 117 12913	1kΩ	5% 0,0625W
3953	© 4822 117 12893	10kΩ	5% 0,0625W
3953	© 4822 117 12924	3,3kΩ	5% 0,0625W
3954	© 4822 117 12925	47kΩ	1% 0,0625W
3955	© 4822 117 12925	47kΩ	1% 0,0625W

not for stage .3
only for stage .3not for stage .3
only for stage .3

RESISTORS

3956	4822 117 12893	10k Ω	5%	0,0625W	
3957	4822 117 12896	47k Ω	5%	0,0625W	
3958	4822 051 30008	CHIP JUMPER 0603			
3961	4822 117 12908	2,2k Ω	5%	0,0625W	not used in stage .3
3966	4822 051 30392	3,9k Ω	5%	0,06W	
3967	4822 051 30392	3,9k Ω	5%	0,06W	not for stage .3
3967	12NC follows	1,2k Ω	5%	0,0625W	only for stage .3
3968	4822 117 12904	5,6k Ω	5%	0,0625W	
3969	4822 117 12886	4,7k Ω	5%	0,0625W	

Remark: 3969 must be built-in with software versions \geq v19 !!
Take care when replacing the μ P.

COILS

5250	4822 157 10395	33 μ H	20%	D73F
5251	4822 157 70753	100 μ H	10%	LQH4N
5252	4822 146 10412	20 μ H		395HN-A002EG
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
6253	4822 130 82588	SB10-05PCP
6254	4822 130 82588	SB10-05PCP
6255	4822 130 83757	BAS216

6300 © 5322 130 34331 BAV70

TRANSISTORS

7240	5322 130 60508	BC857B
7241	5322 130 60508	BC857B
7245	4822 130 10736	BUK581-60A not for layout stage .3
7250	5322 130 60508	BC857B
7251	4822 130 62808	2SB1123

7252	4822 130 63646	2SD1623T
7253	4822 130 63646	2SD1623T
7254	12NC follows	2SK2440 only for layout stage .3
7257	5322 130 60508	BC857B
7258	4822 130 60511	BC847B

7259	4822 130 60511	BC847B
7261	4822 130 60511	BC847B
7262	5322 130 60508	BC857B
7351	4822 130 60511	BC847B
7352	4822 130 60511	BC847B

7353	4822 130 60511	BC847B
7354	5322 130 60508	BC857B
7355	4822 130 60511	BC847B
7356	4822 130 60511	BC847B
7357	4822 130 60511	BC847B

7401	5322 130 60508	BC857B
7404	4822 130 60511	BC847B
7405	5322 130 60508	BC857B
7808	4822 130 60511	BC847B
7950	4822 130 60511	BC847B

7951 © 5322 130 60508 BC857B

INTEGRATED CIRCUITS

7255	4822 209 16081	MPC1825AVM DC/DC-CONVERTER
7256	4822 209 71448	NJM2903M
7300	4822 209 16082	TC9404FN DAC
7350	4822 209 16083	BA3574BFS HEADPHONE AMP.
7400	4822 209 16213	TMP87CK20AF AZ7395.2 (v19)

7807	4822 209 16084	SAA7374GP/M1/C DECODER CD7
7809	4822 209 16211	SM5902AF NPC
7810	4822 209 16094	HYB314400BJ-60 DRAM 4Mbit
7811	4822 209 16094	HYB314400BJ-60 DRAM 4Mbit
7952	4822 209 16085	MPC17A50VM SERVO DRIVER

7956 © 5322 209 12343 LM2904D