

Service  
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# Service Manual



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**PHILIPS**

## TECHNICAL SPECIFICATION

### General

Dimensions (W x H x D) : 130.4 x 14.5 x 135.5mm  
 Weight without batteries : 125g

### Power supply modes

DC-in socket : 2.9..7.0V  
 Primary batteries (battery box) : 1.6..3.6V  
 Rechargeable batteries (AY3364) : 1.6..3.6V  
 Voltage protection DC-in socket : -14.5..+14.5V

### Battery lifetime

BATTERY LIFETIME	ESP/LP=on
Primary batteries 2 x LR06	≥31h (43h typ.)
Rechargeable batteries AY3364 (2 x 600mAh)	≥16h (23h typ.)
AY3364 + 2 x LR06	≥49h (70h typ.)

### Battery level detection

DETECTION LEVEL	RECHARGEABLE BATTERIES
Battery empty	1.7V +100/-50mV
Battery weak 1	battery empty level + 0.8V ±100mV
Battery weak 2	battery empty level + 0.6V ±100mV
Battery weak 3	battery empty level + 0.4V ±100mV

### Charge section (not on all versions)

Charge current : 280mA ±10%  
 Charge time for 80% AY3364 : 4.0h nom.  
 Charge time for 100% AY3364 : 6.0h nom.  
 Max. charge time (µP controlled) : 7h  
 Temperature protection : 50°C ±5°C

### Current consumption

CURRENT CONSUMPTION	DC-IN (4.5V)	BATTERY SUPPLY (2.25V)		
	ESP/LP=off	ESP/LP=on average	ESP/LP=on off-phase <sup>1)</sup>	ESP=on LP=off
Play-mode	80mA typ.	75mA typ.	25mA typ.	120mA typ.
Jump-mode	300mA typ.	n/a	n/a	n/a
Charge-mode	230mA typ.	n/a	n/a	250mA typ.
Stand-by (excl. recharge)	21mA typ.	250µA typ.	250µA typ.	250µA typ.

<sup>1)</sup> off-phase means servos switched off and audio data is played back from ESP memory

### Shock resistance (ESP=off)

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

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

Output power (THD≤10%)  
 /17 version only : 2x7mW (+1/-3dB)  
 all other versions : 2x3mW (+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

### Sound presets

SOUND PRESET	Frequency response		
	63kHz	1kHz	10kHz
DBB1	+6dB ±2dB	0dB ±2dB	0dB ±2dB
DBB2	+9dB ±2dB	0dB ±2dB	+5dB ±2dB

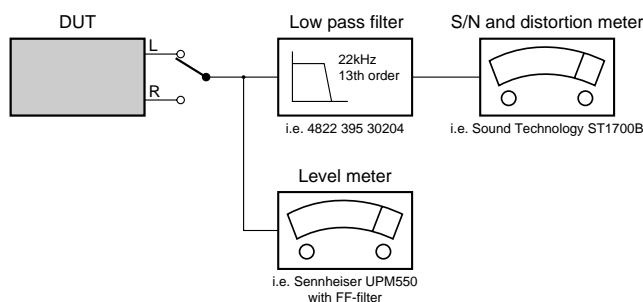
### Laser

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

### Measurement setup

Use Audio Signal disc SBC429

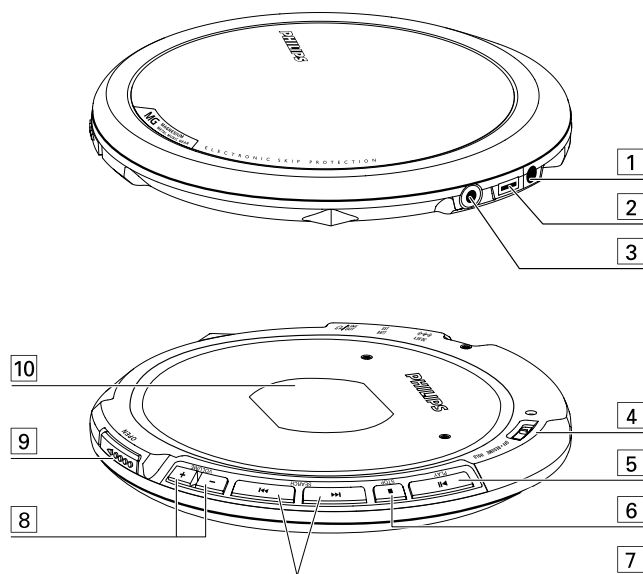
4822 397 30184



<sup>1)</sup> off-phase means servos switched off and audio data is played back from ESP memory

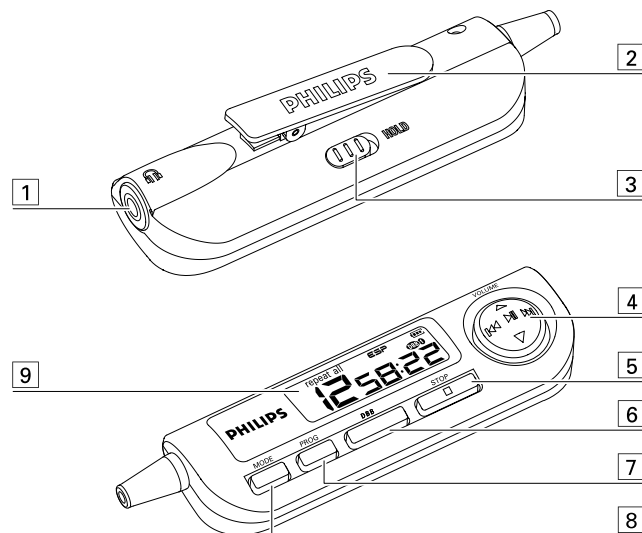
## CONNECTIONS AND CONTROLS

### Portable CD-player AX7201



- 1 4.5V DC .....jack for AC/DC adaptor power supply
- 2 EXT. BATT .....jack for external battery supply
- 3 /LINE OUT ....connect the remote control here and your headphones to the remote control. Insert the supplied **headphone jack adaptor** (for some versions only) first, if you want to connect the headphones direct, or want to connect the player to another audio input of an additional appliance.
- 4 OFF .....switches RESUME and HOLD off  
RESUME.....stores the last position played  
HOLD .....locks all buttons
- 5 .....switches the player on, starts or pauses CD play
- 6 .....stops CD play, clears a program or switches the player off
- 7 .....skips and searches CD tracks backwards  
 .....skips and searches CD tracks forwards
- 8 + .....volume up  
- .....volume down
- 9 .....opens the CD lid
- 10 .....type plate

### Remote Control AY3774



- 1 .....3.5mm headphone jack
- 2 Clip
- 3 HOLD .....locks all buttons
- 4 VOL (, ) .....adjusts the volume  
 .....switches the set on, starts and pauses playback  
 / .....skips and searches backward / forward tracks
- 5 .....stops playback and switches the set off
- 6 DBB.....switches the bass enhancement on and off
- 7 PROG .....programs tracks and reviews the program
- 8 MODE .....selects the different playing possibilities
- 9 DISPLAY

## FEATURES

FEATURES	AX7201 (all versions)
CD-REWRITABLE COMPATIBILITY	●
ELECTRONIC SKIP PROTECTION CDDA	45s
ESP DRAM SIZE	16Mbit
HOLD / RESUME FUNCTION	● / ●
DBB STAGES	2
ACOUSTIC FEEDBACK	●
PROGRAM MEMORY	99
RECHARGE FUNCTION	●
CORD LCD REMOTE CONTROL	●
LINE / DIGITAL OUTPUT	- / -

## ACCESSORIES

ACCESSORIES		AX7201				
		/00c	/01	/05z	/10	/17
AY3170/00 AC/DC Adaptor	4822 219 10617	X				
AY3170/02 AC/DC Adaptor	4822 219 10676		X			
AY3170/05 AC/DC Adaptor	3140 118 33610			X		
AY3170/10 AC/DC Adaptor	4822 219 10681				X	
AY3170/17 AC/DC Adaptor	4822 219 10616					X
AY3364 Rechargeable Gum batteries	3103 308 84601	X	X	X	X	X
AY3464 HIFI CORD (3.5mm → cinch, L-plug)	4822 320 11881	O	O	O	O	O
AY3380 External battery case	3140 118 51261	X	X	X	X	X
AY3501/00 Car Adaptor Cassette	4822 397 10059	O	O	O	O	O
AY3545/00 Car DC/DC Converter	4822 219 10033	O	O	O	O	O
AY3774 Cord LCD Remote Control	3140 118 51251	X	X	X	X	X
SBC HE545/77s Earphone (S-plug)	9082 100 00269	X	X	X	X	X
Headphone Jack Adaptor (2.5PG → 3.5ST)	3103 308 84670	X	X	X	X	X

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 $\Omega$ )

**extendible cable** (2m, 2M $\Omega$ , to connect wristband to connection box)

**connecting cable** (3m, 2M $\Omega$ , to connect table mat to connection box)

**earth cable** (1M $\Omega$ , 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 board assembly proceed as follows:

1. Remove the bottom screws (4x)
2. Remove the cabinet screws (4x)
3. Lift the bottom (take care of cabinet/bottom snaps)
4. Supply the unit via external DC-socket

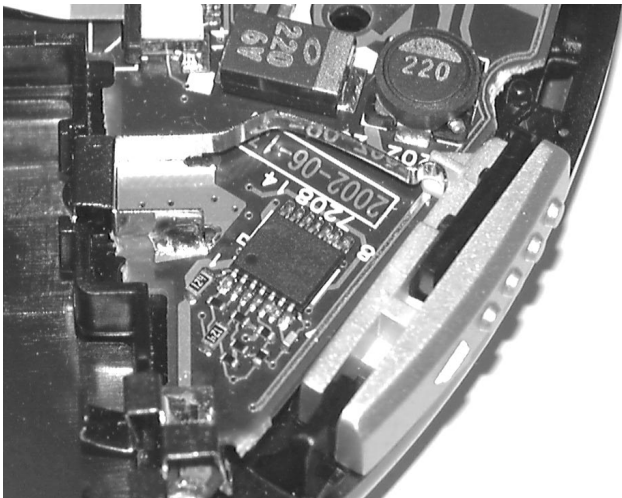
### REPAIR POSITION COMPONENTSIDE



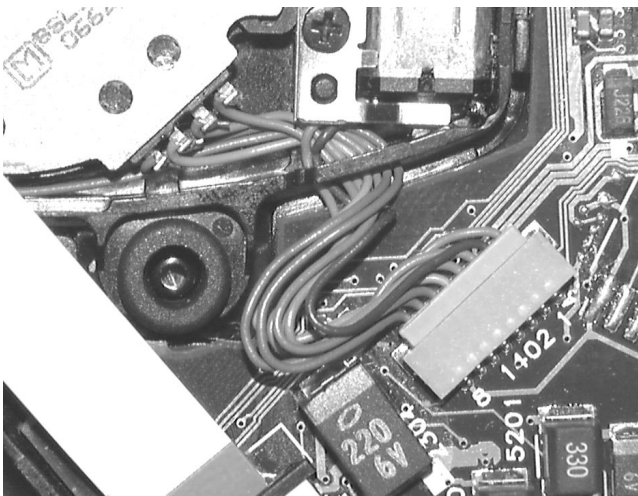
To get access to the componentside of the printed board assembly proceed as follows:

1. Remove the bottom screws (4x)
2. Remove the cabinet screws (4x)
3. Lift the bottom (take care of cabinet/bottom snaps)
4. Lift the printed boards and flip the main board
5. Supply the unit via external DC-socket
6. Short-circuit door-switch 1409 during measurements

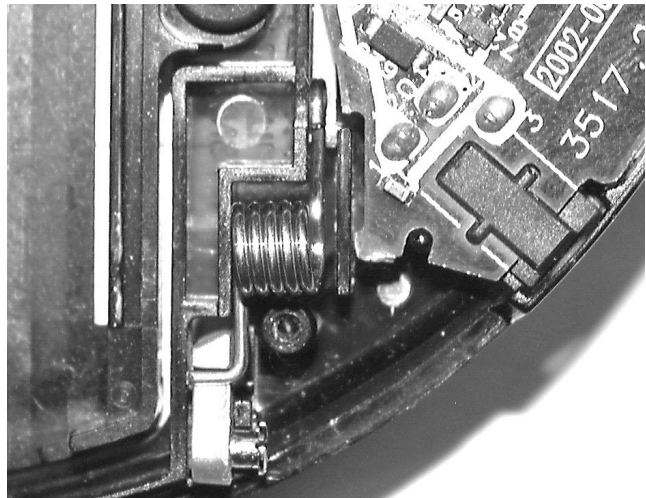
### POSITIONING OF SPRING-OPEN



### ROUTING OF CD-DRIVE WIRES

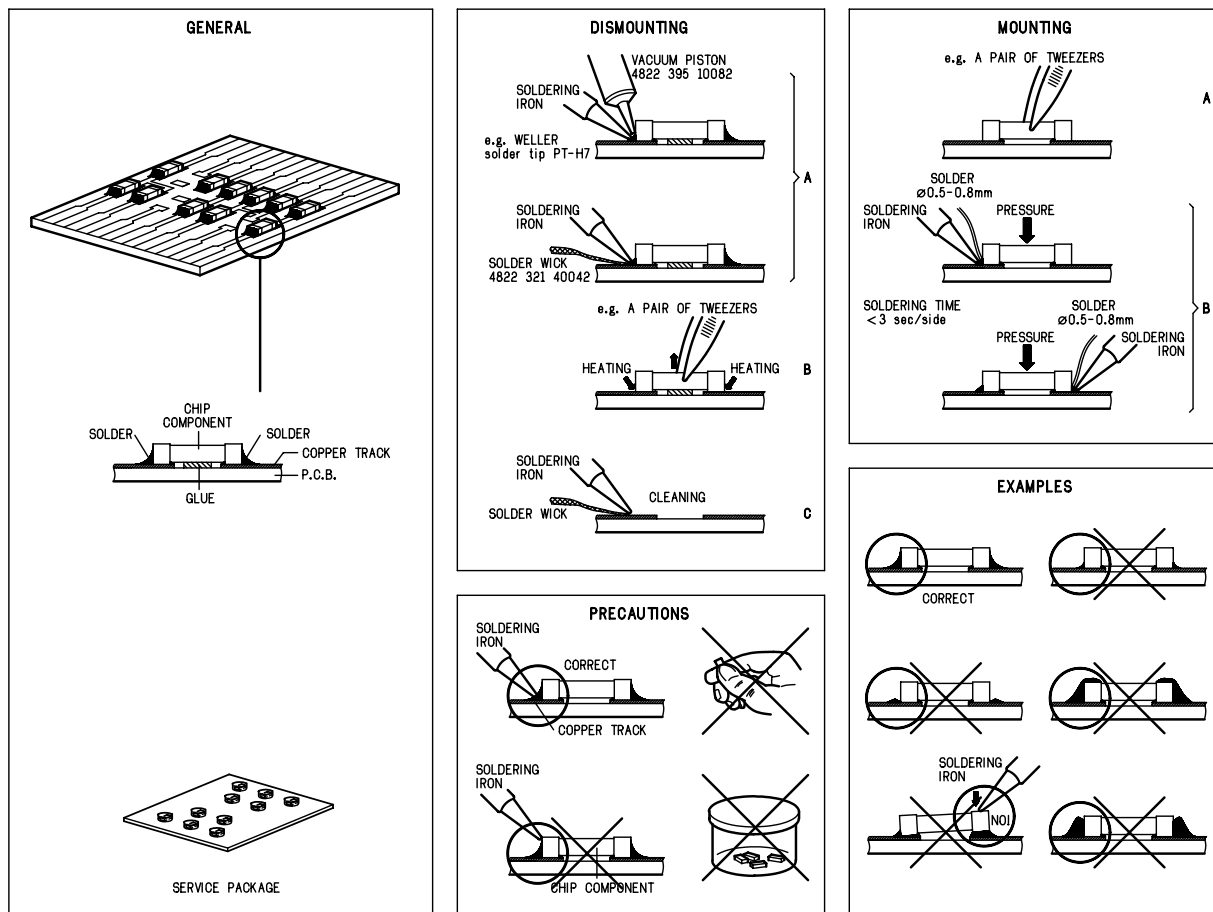


### POSITIONING OF SPRING-CD-DOOR



Remark: The spring for the CD-door is positioned loose in the cabinet assembly as shown in the picture above. It will be caught in its defined position just after mounting cabinet and bottom parts together.

**HANDLING CHIP COMPONENTS**



**SERVICE TOOLS**

Audio signal disc SBC429  
 Playability test disc SBC444A  
 CD-RW printed audio disc

4822 397 30184  
 4822 397 30245  
 7104 099 96611

**ESD PROTECTION EQUIPMENT**

Anti-static table mat large 1200x650x1.25mm  
 small 600x650x1.25mm  
 Anti-static wristband  
 Connection box (3 press stud connections, 1MΩ)  
 Extendible cable (2m, 2MΩ, to connect wristband to connection box)  
 Connecting cable (3m, 2MΩ, to connect table mat to connection box)  
 Earth cable (1MΩ, to connect any product to mat or to connection box)  
 KIT ESD3 (combining all 6 prior products - small table mat)  
 Wristband tester

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 4822 320 11308  
 4822 310 10671  
 4822 344 13999

## PIN DESCRIPTION OF INTEGRATED CIRCUITS

### AN8399SA – HF-PREAMPLIFIER

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	PD	→ HF-preamp	input for LD output monitoring PD signals
2	LD	→ HF-preamp	external TR drive pin for driving LD
3	VCC	+HF	power supply
4	RFN	→ HF-preamp	RF addition amp inverting input
5	RFOUT	HF-preamp →	RF addition amp output
6	RFIN	→ HF-preamp	AGC amp input
7	LDRCTL	→ HF-preamp	LD reference voltage control pin
8	CAGC	→ HF-preamp	AGC loop filter connection pin
9	ARF	HF-preamp →	RF after AGC output
10	CEA	→ HF-preamp	capacitor for 3T-ENV detection filter connection pin
11	3TOUT	HF-preamp →	3T-ENV detection output
12	CBDO	→ HF-preamp	capacitor for low-speed dark level BDO detection connection pin
13	BDO	HF-preamp →	BDO detection output
14	COFTR	→ HF-preamp	capacitor for low-speed off-track detection connection pin
15	OFTR	HF-preamp →	off-track detection output
16	NRFDET	HF-preamp →	RF signal amplitude detection information output
17	GND	GND	ground pin
18	SLPSW	→ HF-preamp	sleep mode control pin
19	VREF	VREF	reference voltage output ( $VCC / 2$ )
20	TEN	→ HF-preamp	TE amp inverting input
21	TEOUT	HF-preamp →	track error output
22	FEN	→ HF-preamp	FE amp inverting input
23	FEOUT	HF-preamp →	focus error output
24	GCTL	→ HF-preamp	gain & APC control pin
25	FBAL	→ HF-preamp	pin to input signal for controlling focus balance adjustment
26	TBAL	→ HF-preamp	pin to input signal for controlling tracking balance adjustment
27	E	→ HF-preamp	satellite diode signal input
28	F	→ HF-preamp	satellite diode signal input
29	D	→ HF-preamp	central diode signal input
30	B	→ HF-preamp	central diode signal input
31	C	→ HF-preamp	central diode signal input
32	A	→ HF-preamp	central diode signal input

### SM8613AV – LASER DIODE DRIVER

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	LDISET	→ laser diode driver	LD drive maximum current setting resistor connection
2	NC1	–	no connection
3	MUTE	→ laser diode driver	intermittent drive stop signal
4	PCK	→ laser diode driver	intermittent control reference pulse input
5	DUTYADJ	→ laser diode driver	intermittent duty ratio adjust resistor connection
6	FLOCK	→ laser diode driver	intermittent drive control signal
7	NC2	–	no connection
8	GND	GND	ground
9	PDVIN	→ laser diode driver	laser luminosity monitor voltage input
10	NC3	–	no connection
11	LDOFF	→ laser diode driver	LD drive current control signal
12	LDIOUT	laser diode driver →	LD drive current output
13	VCC	+2.6V	supply voltage
14	RG2	laser diode driver →	APC frequency response control capacitor connection
15	NC4	–	no connection
16	RG1	→ laser diode driver	APC loop gain control resistor connection



**BH6541KV – SERVO DRIVER**

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	PVCC1_1	+A	power supply for H-bridge driver
2	PVCC1_2	+A	power supply for H-bridge driver
3	HBOUT1	servo driver →	H-bridge driver output
4	HBOUT2	servo driver →	H-bridge driver output
5	PGND1_1	GND	power ground
6	PGND1_2	GND	power ground
7	W_OUT	servo driver →	spindle phase W
8	PVCC2	→ servo driver	power supply for spindle driver
9	V_OUT	servo driver →	spindle phase V
10	PGND2	GND	power ground
11	U_OUT	servo driver →	spindle phase U
12	PVCC3	→ servo driver	power supply for spindle driver
13	SPCOM	→ servo driver	motor coil center input terminal
14	SPWIN	→ servo driver	comparator input for SPIN detection (W-phase)
15	SPVIN	→ servo driver	comparator input for SPIN detection (V-phase)
16	SPUIN	→ servo driver	comparator input for SPIN detection (U-phase)
17	CST	→ servo driver	connection terminal of starting oscillating condenser
18	VCC	+2.6V	power supply for control block
19	GND	GND	ground
20	VG	→ servo driver	power supply for gate of power MOS
21	CSL2	→ servo driver	connection terminal 2 for slope capacitor
22	CSL1	→ servo driver	connection terminal 1 for slope capacitor
23	MUTE1	μP → servo driver	mute terminal for all
24	MUTE2	μP → servo driver	mute terminal for channel 1, 2, 3
25	VO3F	servo driver →	channel 3 forward output
26	VO3R	servo driver →	channel 3 reverse output
27	PVCC4	→ servo driver	power supply for H-bridge driver
28	PGND3	GND	power ground
29	C2N	→ servo driver	capacitor 2 connect pin for charge pump (-)
30	C2P	→ servo driver	capacitor 2 connect pin for charge pump (+)
31	C1N	→ servo driver	capacitor 1 connect pin for charge pump (-)
32	C1P	→ servo driver	capacitor 1 connect pin for charge pump (+)
33	VO2F	servo driver →	channel 2 forward output
34	VO2R	servo driver →	channel 2 reverse output
35	VO1F	servo driver →	channel 1 forward output
36	VO1R	servo driver →	channel 1 reverse output
37	PGND4	GND	power ground
38	EXTCLK	→ servo driver	synchronous clock terminal
39	IN1F	→ servo driver	channel 1 forward input
40	IN1R	→ servo driver	channel 1 reverse input
41	IN2F	→ servo driver	channel 2 forward input
42	IN2R	→ servo driver	channel 2 reverse input
43	IN3F	→ servo driver	channel 3 forward input
44	IN3R	→ servo driver	channel 3 reverse input
45	FG	servo driver → μP	FG output
46	HBIN	→ servo driver	H-bridge driver input
47	BRK	→ servo driver	brake terminal
48	VMON	→ servo driver	PVCC / 2 monitor terminal

## MN662786SB – DIGITAL SIGNAL PROCESSOR FOR CD

Pin	Name	Direction	Description
1	DRVDD	+2.6V	power supply for DRAM interface
2	D0	signal processor ↔ DRAM	DRAM data I/O signal 0
3	D1	signal processor ↔ DRAM	DRAM data I/O signal 1
4	NWE	signal processor → DRAM	DRAM write enable signal
5	NRAS	signal processor → DRAM	DRAM RAS control signal
6	D2	signal processor ↔ DRAM	DRAM data I/O signal 2
7	D3	signal processor ↔ DRAM	DRAM data I/O signal 3
8	NCAS0	signal processor → DRAM	DRAM CAS control signal 0
9	NCAS1	signal processor → DRAM	DRAM CAS control signal 1
10	A8	signal processor → DRAM	DRAM address signal 8
11	A7	signal processor → DRAM	DRAM address signal 7
12	A6	signal processor → DRAM	DRAM address signal 6
13	A5	signal processor → DRAM	DRAM address signal 5
14	A4	signal processor → DRAM	DRAM address signal 4
15	A9	signal processor → DRAM	DRAM address signal 9
16	A0	signal processor → DRAM	DRAM address signal 0
17	A1	signal processor → DRAM	DRAM address signal 1
18	A2	signal processor → DRAM	DRAM address signal 2
19	A3	signal processor → DRAM	DRAM address signal 3
20	DVSS2	GND	ground for digital circuits
21	DVDD2	+1.8V	power supply for digital circuits
22	SPOUT	signal processor →	spindle motor driver signal output
23	TRVP	signal processor →	traverse drive output (+)
24	TRVM	signal processor →	traverse drive output (-)
25	TRP	signal processor →	tracking drive output (+)
26	TRM	signal processor →	tracking drive output (-)
27	FOP	signal processor →	focus drive output (+)
28	FOM	signal processor →	focus drive output (-)
29	IOVDD1	+2.6V	I/O power supply
30	TBAL	signal processor →	tracking balance adjustment output
31	FBAL	signal processor →	focus balance adjustment output
32	FE	→ signal processor	focus error signal input
33	TE	→ signal processor	tracking error signal input
34	RFENV	→ signal processor	RF envelope signal input
35	OFT	→ signal processor	off-track signal input
36	NRFDET	→ signal processor	RF detection signal input
37	BDO	→ signal processor	dropout signal input
38	LDON	signal processor →	laser on signal output
39	ARF	→ signal processor	RF signal input
40	IREF	→ signal processor	reference current input
41	ADPVCC	→ signal processor	A/D converter reference voltage input
42	DSLIF	signal processor →	DSL loop filter
43	DRF	→ signal processor	DSL bias
44	PLLF	signal processor →	PLL loop filter
45	VCOF	signal processor →	jitter-free VCO loop filter
46	AVDD2	+2.6V	power supply for analog circuits
47	AVSS2	GND	ground for analog circuits
48	OUTL	signal processor →	left channel audio output
49	AVSS1	GND	ground for audio output stage
50	OUTR	signal processor →	right channel audio output
51	AVDD1	+3.0V	power supply for audio output stage
52	FSEL	→ signal processor	noise filter for microcontroller interface on/off selection input
53	TMOD1	GND	test input pin 1
54	TMOD2	GND	test input pin 2
55	FLAG	signal processor →	flag signal output
56	IPFLAG	signal processor →	interpolation flag signal output
57	EXT0	signal processor ↔	expansion I/O port 0
58	EXT1	signal processor ↔	expansion I/O port 1
59	IOVDD2	+2.6V	I/O power supply
60	TX	signal processor →	digital audio interface signal output
61	MCLK	→ signal processor	microcontroller command clock signal input
62	MDATA	→ signal processor	microcontroller command data signal input
63	MLD	→ signal processor	microcontroller command load signal input
64	BLKCK	signal processor →	subcode block clock signal output (f=75Hz at normal speed)
65	PWMSEL	signal processor ↔	PWM output mode selection input
66	SMCK	signal processor →	4.236MHz / 8.4672MHz clock signal output
67	DMUTE	signal processor ↔	muting input
68	STAT	signal processor →	status signal output
69	NRST	→ signal processor	reset input
70	SPPOL	signal processor →	spindle motor drive signal output
71	PMCK	signal processor →	88.2kHz clock signal output
72	NCLDCK	signal processor →	frame sync signal output (f=7.35kHz at normal speed)
73	SUBC	signal processor →	subcode serial output
74	SBCK	→ signal processor	subcode serial output clock input
75	NTEST	+2.6V	test input pin
76	X2	signal processor →	crystal oscillator output pin (f=16.9344Hz)
77	X1	→ signal processor	crystal oscillator output pin (f=16.9344Hz)
78	DVSS1	GND	ground for digital circuits
79	DVDD1	+1.8V	power supply for digital circuits
80	EXT2	→ signal processor	Expansion I/O port 2

## SERVICE TEST PROGRAM

To enter the Service Test Program proceed as follows:

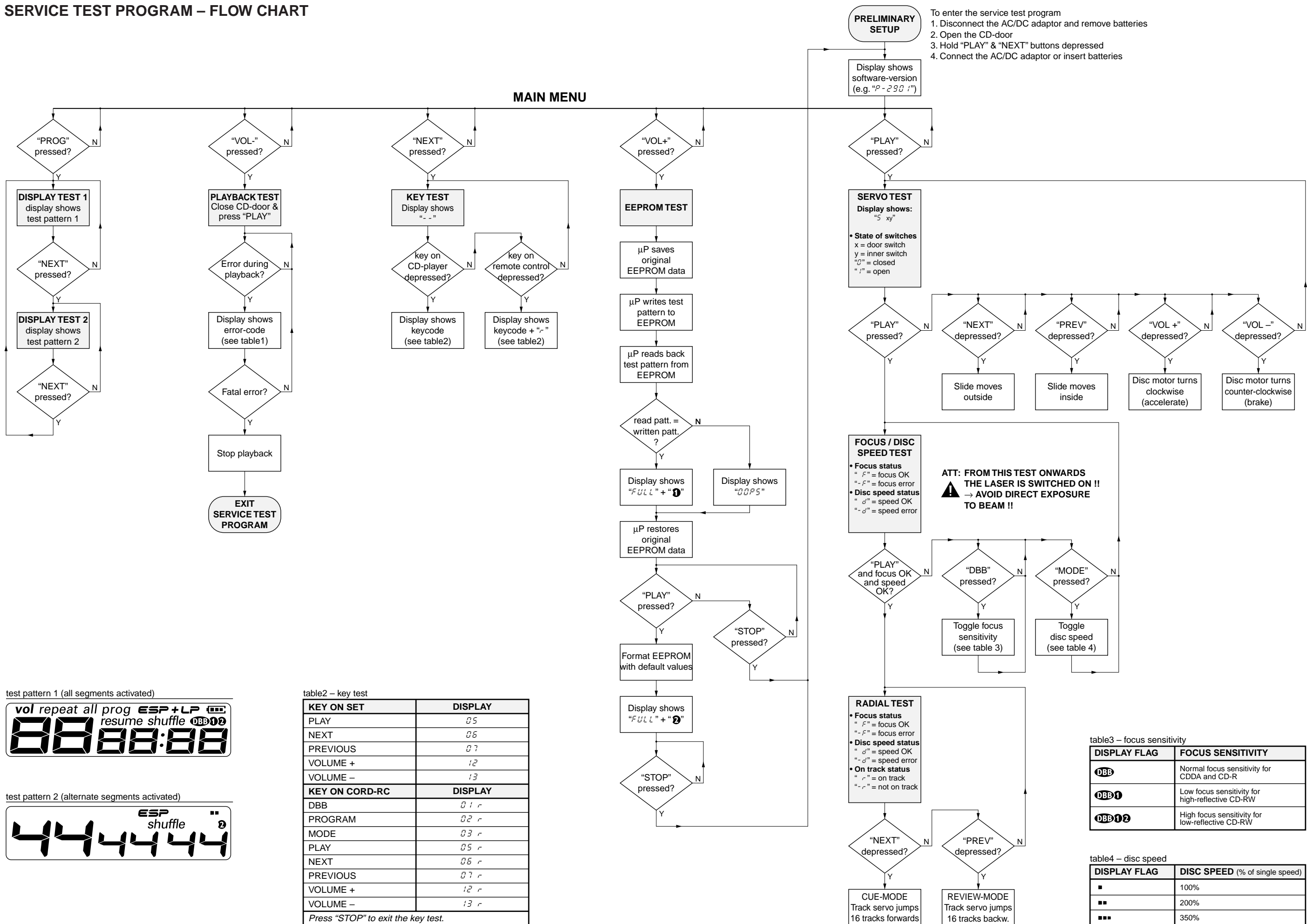
1. Disconnect the AC/DC adaptor and remove batteries
2. Open the CD-door
3. Hold PLAY & NEXT buttons depressed
4. Connect the AC/DC adaptor or insert batteries

The display shows the software version (e.g. "P - 290 1").  
The program is now in the main menu. The built-in tests can be started via dedicated buttons. See flow chart on next page for details.

table1 – error codes for playback test

CODE	ERROR	TYPE	CAUSE
E1000	focus error	non fatal	Triggered when the focus is lost during playback.
E1001	radial error	non fatal	Triggered when the radial servo is off-track for a certain time during playback.
E1002	slide in error	non fatal	The sledge did not reach its inner position (innerswitch is closed) before approximately 6 seconds have passed by – innerswitch or slidemotor problem.
E1003	slide out error	non fatal	The slide did not come out of its inner position (innerswitch is open) before approximately 250ms have passed by – innerswitch or slidemotor problem.
E1004	DRAM filling error	non fatal	The DRAM controller was not able to connect two consecutive audio frames. Therefore, the $\mu$ P had to issue a direct audio connection that produces audible clicks.
E1005	jump error	non fatal	Triggered when the jump destination could not be found within a certain time.
E1006	subcode error	non fatal	No valid subcode for a certain time during play.
E1007	PLL error	non fatal	The Phase-Lock-Loop could not lock within a certain time.
E1008	turntable motor error	non fatal	Generated when motor speed is not within $\pm 20\%$ of target speed.
E1009	audio error	non fatal	Uncorrectable audio error.
E1010	automatic adjustment error	non fatal	Automatic gain adjustment was not successful within a certain time.
E1011	focus rough gain error	non fatal	Focus rough gain adjustment was not successful within a certain time.
E1020	focus search error	fatal	The focus point has not been found within a certain time.
E1022	fatal subcode error	fatal	No more valid subcode information.
E1030	automatic adjustment focus rough gain error	fatal	The AGC focus rough gain was not successful within a certain time.
E1034 E1044	automatic adjustment tracking rough gain error	fatal	The AGC tracking rough gain was not successful within a certain time.
E1035 E1045	automatic adjustment track balance error	fatal	The AGC focus track balance was not successful within a certain time.
E1036 E1046	automatic adjustment focus balance error	fatal	The AGC focus balance was not successful within a certain time.
E1037 E1047	automatic adjustment focus fine gain error	fatal	The AGC focus fine gain was not successful within a certain time.
E1038 E1048	automatic adjustment tracking fine gain error	fatal	The AGC tracking fine gain was not successful within a certain time.

# SERVICE TEST PROGRAM – FLOW CHART



- To enter the service test program
1. Disconnect the AC/DC adaptor and remove batteries
  2. Open the CD-door
  3. Hold "PLAY" & "NEXT" buttons depressed
  4. Connect the AC/DC adaptor or insert batteries

test pattern 1 (all segments activated)



test pattern 2 (alternate segments activated)

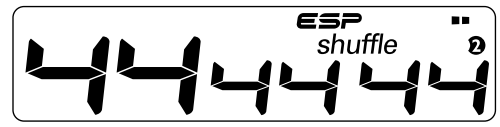


table2 – key test

KEY ON SET	DISPLAY
PLAY	05
NEXT	06
PREVIOUS	07
VOLUME +	12
VOLUME -	13
KEY ON CORD-RC	DISPLAY
DBB	01 r
PROGRAM	02 r
MODE	03 r
PLAY	05 r
NEXT	06 r
PREVIOUS	07 r
VOLUME +	12 r
VOLUME -	13 r

Press "STOP" to exit the key test.

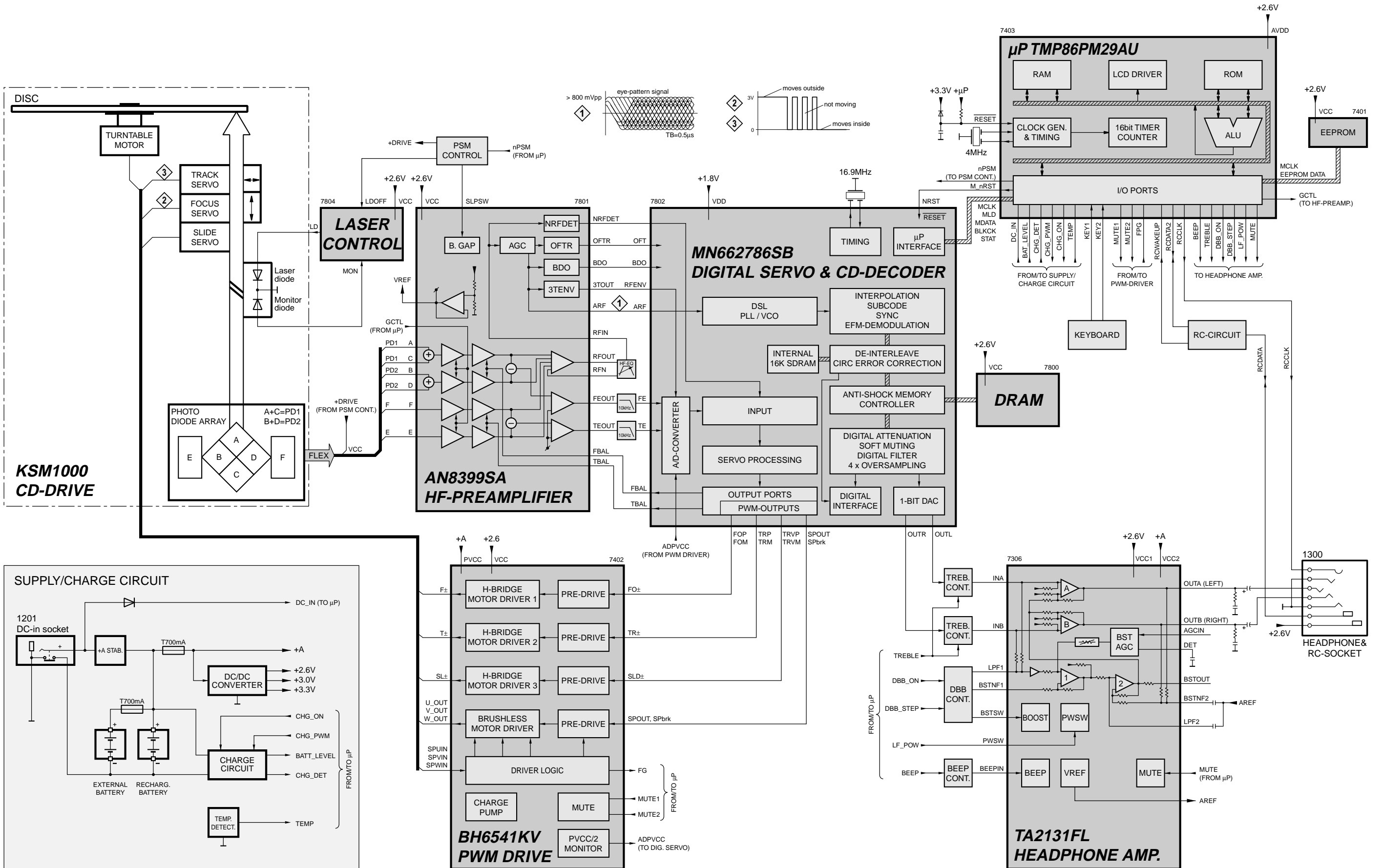
table3 – focus sensitivity

DISPLAY FLAG	FOCUS SENSITIVITY
DBB	Normal focus sensitivity for CDDA and CD-R
DBB1	Low focus sensitivity for high-reflective CD-RW
DBB12	High focus sensitivity for low-reflective CD-RW

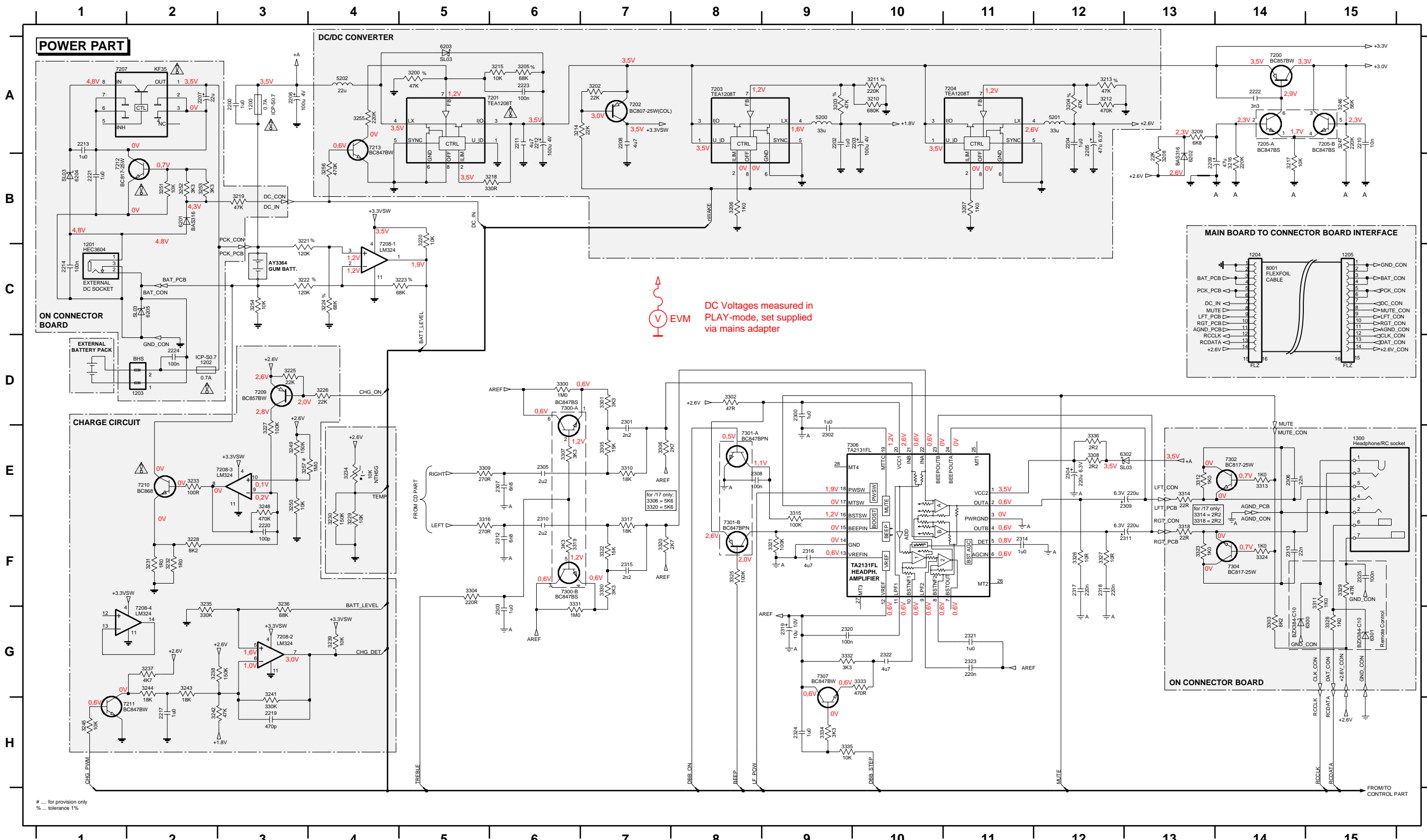
table4 – disc speed

DISPLAY FLAG	DISC SPEED (% of single speed)
■	100%
■■	200%
■■■	350%

BLOCKDIAGRAM

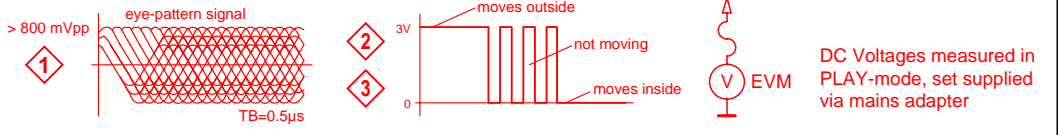
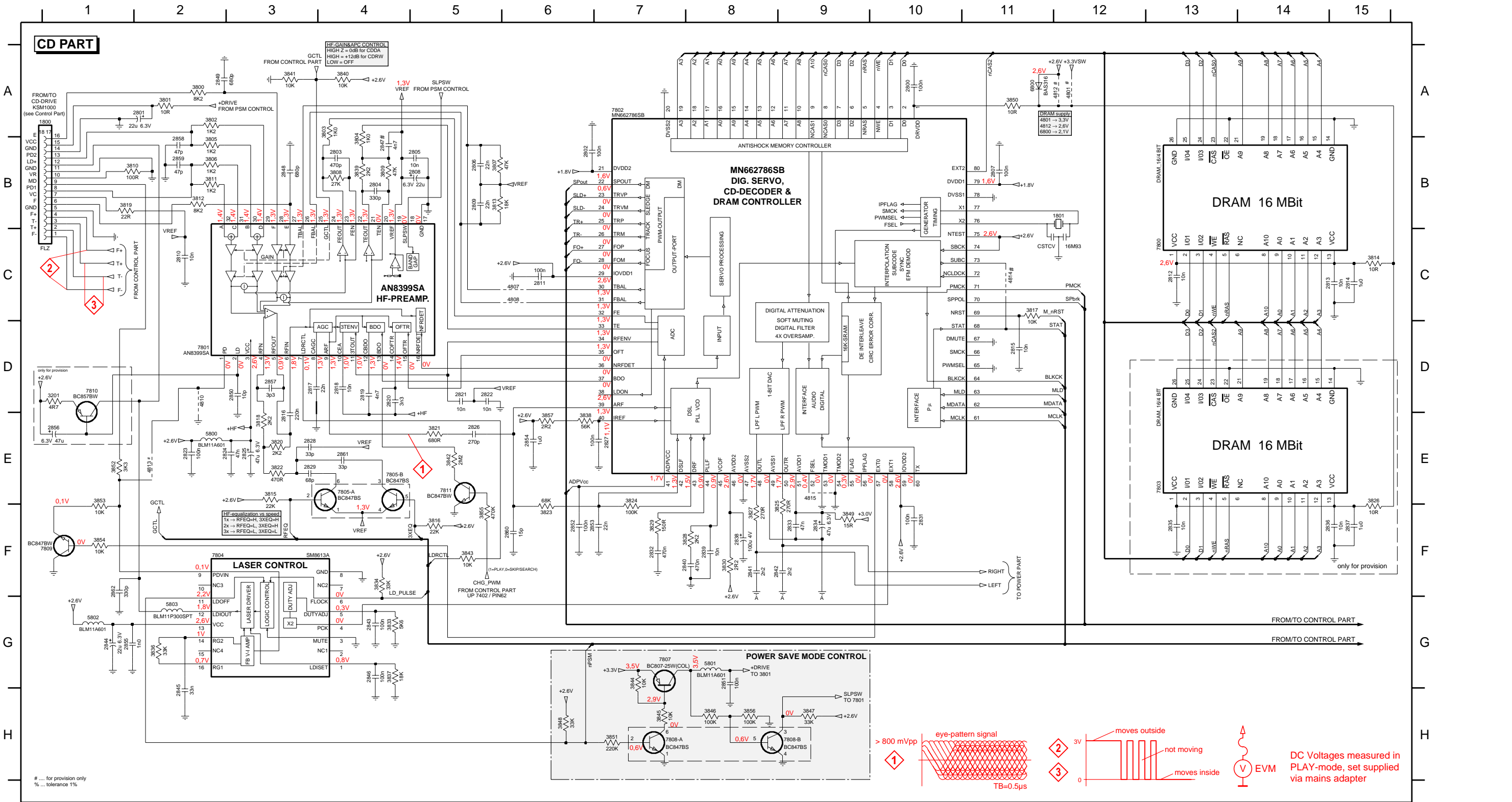


1200 A3	2202 A9	2210 A15	2221 B1	2304 E12	2312 F6	2320 G9	3203 A9	3211 A10	3219 B3	3227 E3	3235 F2	3244 G2	3252 B2	3302 D8	3310 E7	3318 F13	3326 F12	3334 H9	6203 A5	7202 A7	7208-3 E3	7300-B F6
1201 C1	2203 A10	2211 A6	2222 A14	2305 E6	2313 F14	2321 G11	3204 A12	3212 A12	3220 B5	3228 F2	3236 F3	3245 H1	3253 B2	3303 G14	3311 F15	3319 F6	3327 F12	3335 H9	6204 B1	7203 A8	7208-4 G2	7301-A E8
1202 D2	2204 A12	2212 A6	2223 A6	2306 E14	2314 F11	2322 G10	3205 A6	3213 A12	3221 B3	3229 F4	3237 G2	3246 A15	3254 C3	3304 F5	3312 E13	3320 F7	3328 G15	3336 E12	6205 C2	7204 A11	7209 D3	7301-B F8
1203 D2	2205 A12	2213 A1	2224 D2	2307 E6	2315 F7	2323 G11	3206 B8	3214 A6	3222 C3	3230 F4	3238 G2	3247 A15	3255 A4	3305 E7	3313 E14	3321 F9	3329 F15	3337 A9	6300 G14	7205-A A14	7210 E2	7302 E14
1204 C14	2206 A3	2214 C1	2220 D9	2308 E8	2316 F9	2324 H9	3207 B11	3215 A6	3223 C5	3231 F2	3239 G4	3248 E3	3256 B4	3306 E7	3314 E13	3322 F7	3330 F7	5201 A12	6301 G14	7205-B A15	7211 H1	7304 F14
1205 C15	2207 A2	2217 H2	2301 D7	2309 E13	2317 F12	2325 F15	3208 B13	3216 B14	3224 C4	3232 F2	3241 G3	3249 E3	3257 E3	3307 E6	3315 E9	3323 F13	3331 F6	5202 A4	6302 E13	7207 A2	7212 B1	7306 E10
1300 E15	2208 A7	2219 H3	2302 E9	2310 F6	2318 F12	2320 A5	3209 A13	3217 B14	3225 D3	3233 E2	3242 H2	3250 E3	3300 D6	3308 E12	3316 F5	3324 F14	3332 G9	6201 B2	7200 A14	7208-1 B4	7213 A4	7307 G9
2200 A3	2209 B13	2220 F3	2303 G6	2311 F13	2319 G9	2320 A7	3210 A10	3218 B6	3226 D4	3234 E4	3243 G2	3251 B2	3301 D7	3309 E5	3317 F7	3325 F8	3333 G10	6202 B13	7201 A5	7208-2 G3	7300-A D6	8001 C14



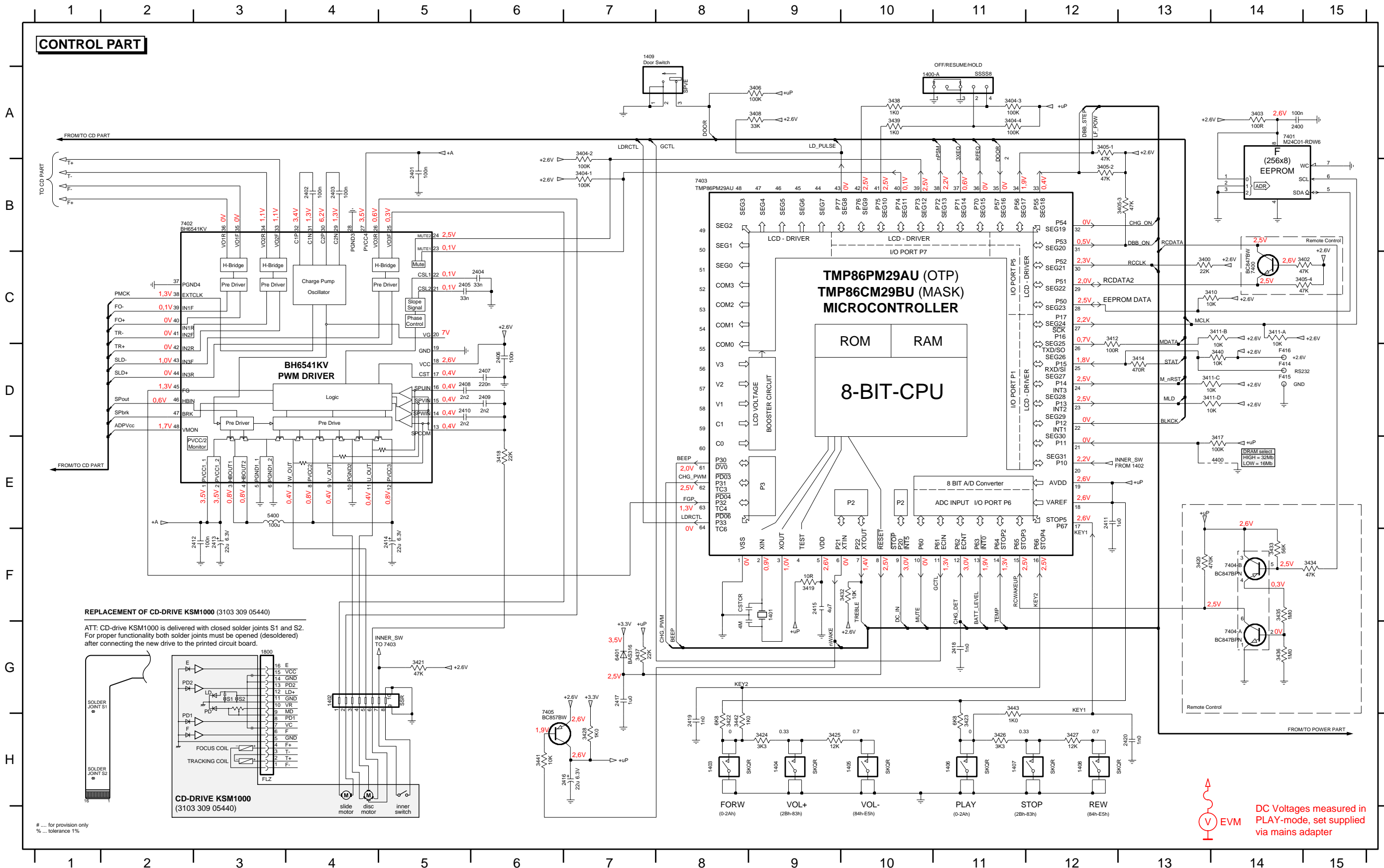
# ... for provision only  
% ... tolerance 1%


1800 C1	2804 B4	2810 C2	2816 E3	2822 D5	2828 E3	2835 F13	2841 F8	2847 B4	2853 F7	2859 B2	3801 A2	3807 B5	3813 B5	3819 B1	3825 F9	3833 G4	3840 A4	3846 H8	3852 E1	4801 A12	4814 C11	6800 A11	7805-A E4	7810 D1
1801 B12	2805 B5	2811 C6	2817 D3	2823 E2	2829 E3	2836 F15	2842 F9	2848 B3	2854 E6	2860 F6	3802 A2	3808 B4	3814 C15	3820 E3	3826 E15	3834 F4	3841 A3	3847 H9	3853 E1	4807 C6	4815 E9	7800 C13	7805-B E4	7811 E5
2800 A10	2806 B5	2812 C13	2818 D4	2824 E3	2831 F10	2837 F15	2843 G4	2849 A2	2855 G1	2861 E4	3803 A4	3809 B4	3815 E3	3821 E5	3827 F8	3836 G2	3842 E5	3848 H6	3854 F1	4808 C6	5800 E2	7801 D2	7805-G7	
2801 A2	2807 B11	2813 C15	2819 D4	2825 E3	2832 F7	2838 F8	2844 G1	2850 D3	2856 E1	2862 F1	3804 B4	3810 B1	3816 F5	3822 F3	3828 F8	3837 G4	3843 F5	3849 F9	3855 F5	4810 D2	5801 G8	7802 A11	7805-A H7	
2802 B6	2808 B5	2814 C15	2820 D4	2826 E5	2833 F9	2839 F8	2845 H2	2851 G8	2857 D3	2863 F1	3805 B2	3811 B2	3817 C11	3823 E6	3829 F7	3838 E6	3844 G7	3850 A11	3856 H8	4812 A12	5802 G1	7803 E13	7805-B H7	
2803 B4	2809 B5	2815 D11	2821 D5	2827 E7	2834 F9	2840 F8	2846 G4	2852 F6	2858 B2	2864 A2	3806 B2	3812 B2	3818 E3	3824 E7	3830 F8	3839 B4	3845 H7	3851 H7	3857 E6	4813 E2	5803 G2	7804 G4	7805-F1	



# ... for provision only  
% ... tolerance 1%

1400-A A10	1404 H9	1408 H12	2402 B4	2406 D6	2410 D5	2414 F5	2418 G11	3402 C15	3404-3 A11	3405-3 B13	3410 C14	3411-D D14	3418 E6	3422 H8	3426 H11	3433 F14	3437 G7	3441 H6	5400 E3	7402 B2	7405 H6
1401 F9	1405 H10	1409 A7	2403 B4	2407 D6	2411 E12	2415 F9	2419 H8	3403 A14	3404-4 A11	3405-4 C15	3411-A C14	3412 C12	3419 F9	3423 H11	3427 H12	3434 F14	3438 A10	3442 H8	6401 G7	7403 B8	
1402 G4	1406 H11	2400 A14	2404 C6	2408 D5	2412 F3	2416 H7	2420 H13	3404-1 B7	3405-1 A12	3406 A9	3411-B C14	3414 D13	3420 F13	3424 H9	3428 H7	3435 F14	3439 A10	3443 G11	7400 C14	7404-A G14	
1403 H8	1407 H11	2401 B5	2405 C5	2409 D6	2413 F3	2417 G7	3400 C13	3404-2 A7	3405-2 B12	3408 A9	3411-C D14	3417 E14	3421 G5	3425 H9	3432 F10	3436 G14	3440 D14	4400 E14	7401 A14	7404-B F14	

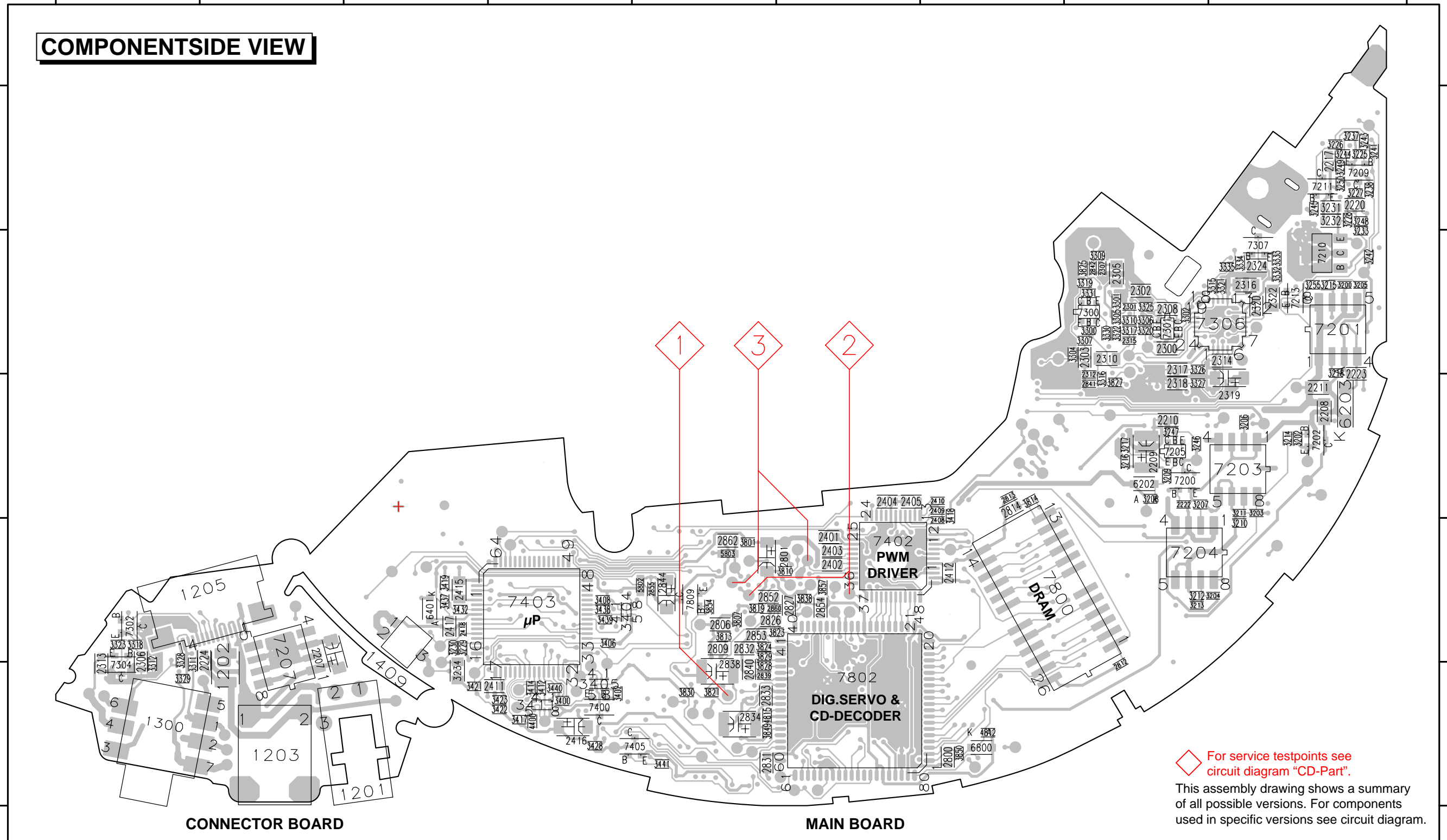



**DC Voltages measured in PLAY-mode, set supplied via mains adapter**



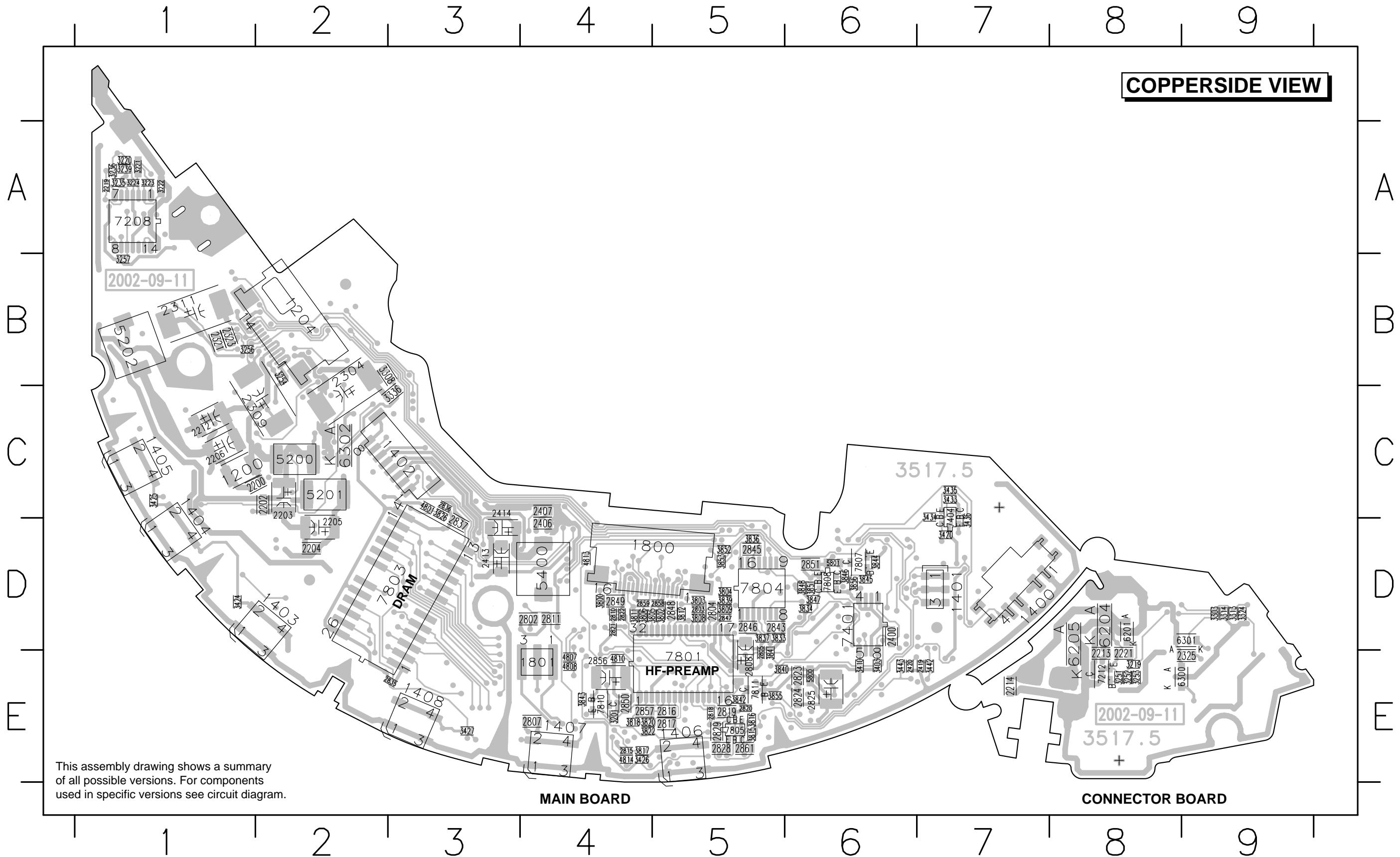
1201 E3	2211 C9	2305 B8	2317 B8	2405 C6	2800 E7	2832 D5	2853 D5	3206 C9	3216 C8	3232 A9	3246 C8	3305 B8	3318 D1	3329 E1	3405 E4	3422 E4	3807 D5	3828 E5	4815 E5	7203 C9	7302 D1
1202 E2	2217 A9	2306 D1	2318 C8	2408 D7	2801 D6	2833 E5	2854 D6	3207 C8	3217 C8	3233 B9	3247 C8	3306 B8	3319 B8	3330 B8	3406 D4	3423 E4	3810 D6	3829 D5	5802 D5	7204 D8	7304 E1
1203 E2	2220 A9	2307 B8	2319 C9	2409 C7	2806 D5	2834 E5	2855 D5	3208 C8	3218 B9	3234 E3	3248 A9	3307 B8	3320 B8	3331 B8	3408 D4	3428 E4	3813 D5	3830 E5	5803 D5	7205 C8	7306 B9
1205 D2	2222 C8	2308 B8	2320 B9	2410 C7	2809 D5	2838 E5	2860 D5	3209 C8	3225 A9	3237 A9	3249 A9	3309 B8	3321 B9	3332 B9	3411 E4	3432 D3	3814 C7	3838 D6	6202 C8	7207 D2	7307 B9
1300 E1	2223 C9	2310 B8	2322 B9	2411 E4	2812 E8	2839 E5	2862 D5	3210 D9	3226 A9	3238 A9	3250 A9	3310 B8	3322 B8	3333 B9	3412 E4	3437 D3	3819 D5	3849 E5	6203 C9	7209 A9	7400 E4
1409 E3	2224 D2	2312 C8	2324 B9	2412 D7	2813 C7	2840 E5	3200 B9	3211 C9	3227 A9	3241 A9	3255 B9	3311 E1	3323 D1	3334 B9	3414 E4	3438 D4	3821 E5	3850 E7	6401 D3	7210 B9	7402 D6
2207 D2	2300 B8	2313 E1	2401 D6	2415 D3	2814 C7	2841 C8	3202 C9	3212 D8	3228 A9	3242 B9	3300 B8	3312 E1	3325 B8	3335 B9	3417 E4	3439 D4	3823 D6	3854 D5	6800 E7	7211 A9	7403 D4
2208 C9	2301 B8	2314 B9	2402 D6	2416 E4	2826 D5	2842 B8	3203 C9	3213 D8	3229 D3	3243 A9	3301 B8	3315 B9	3326 B8	3400 E4	3418 C7	3440 E4	3824 D5	3857 D6	7200 C8	7213 B9	7405 E5
2209 C8	2302 B8	2315 B8	2403 D6	2417 D3	2827 D6	2844 D5	3204 D9	3214 C9	3230 D3	3244 A9	3302 B8	3316 C8	3327 C8	3402 E4	3419 D3	3441 E5	3825 B8	4400 E4	7201 B9	7300 B8	7800 D7
2210 C8	2303 B8	2316 B9	2404 C6	2418 D3	2831 E5	2852 D5	3205 B9	3215 B9	3231 A9	3245 A9	3304 B8	3317 B8	3328 D1	3404 D4	3421 E3	3801 D5	3827 C8	4812 E7	7202 C9	7301 B8	7802 E6
																					7809 D5

**COMPONENTSIDE VIEW**



◆ For service testpoints see circuit diagram "CD-Part".  
 This assembly drawing shows a summary of all possible versions. For components used in specific versions see circuit diagram.

1200 C1	1406 E5	2204 D2	2304 B2	2407 C4	2805 E5	2818 E5	2828 E5	2847 D5	2859 D4	3224 A1	3256 B1	3403 E6	3434 C7	3804 D5	3816 E5	3836 D5	3845 D6	3856 D6	5201 C2	6300 E8	7803 D3
1204 B2	1407 E4	2205 D2	2309 C1	2413 D3	2807 E4	2819 E5	2829 E5	2848 D5	2861 E5	3235 A1	3257 B1	3410 E6	3435 C7	3805 D4	3817 E4	3837 D5	3846 D6	4801 C3	5202 B1	6301 D9	7804 D5
1400 D7	1408 E3	2206 C1	2311 B1	2414 C3	2808 E5	2820 E5	2835 E3	2849 D4	3201 E4	3236 A1	3303 D9	3420 D7	3436 D7	3806 D4	3818 E4	3839 D5	3847 D6	4807 E4	5400 D4	6302 C2	7805 E5
1401 D7	1800 D4	2212 C1	2321 B1	2419 E7	2810 D4	2821 D4	2836 C3	2850 E4	3219 E8	3239 A1	3308 B2	3424 D1	3442 E7	3808 D5	3820 E4	3840 E5	3848 D6	4808 E4	5800 E6	7208 A1	7807 D6
1402 C3	1801 E4	2213 E8	2323 B1	2420 E6	2811 D4	2822 D4	2837 D3	2851 D6	3220 A1	3251 E8	3313 D9	3425 C1	3443 E6	3809 D5	3822 E4	3841 E5	3851 D6	4810 E4	5801 D6	7212 E8	7808 D6
1403 D2	2200 C2	2214 E7	2325 E9	2802 D4	2815 E4	2823 E6	2843 D5	2856 E4	3221 A1	3252 E8	3314 D9	3426 E4	3800 D4	3811 D4	3826 C3	3842 E5	3852 D5	4813 D4	6201 D8	7401 D6	7810 E4
1404 C1	2202 C2	2219 A1	2400 D6	2803 D5	2816 E5	2824 E6	2845 D5	2857 E4	3222 A1	3253 E8	3324 D9	3427 E3	3802 D5	3812 D5	3833 D5	3843 E4	3853 D5	4814 E4	6204 D8	7404 C7	7811 E5
1405 C1	2203 C2	2221 E8	2406 D4	2804 D5	2817 E5	2825 E6	2846 D5	2858 D5	3223 A1	3254 B2	3336 C3	3433 C7	3803 D5	3815 E5	3834 D6	3844 D6	3855 E5	5200 C2	6205 D8	7801 E5	



**COPPERSIDE VIEW**

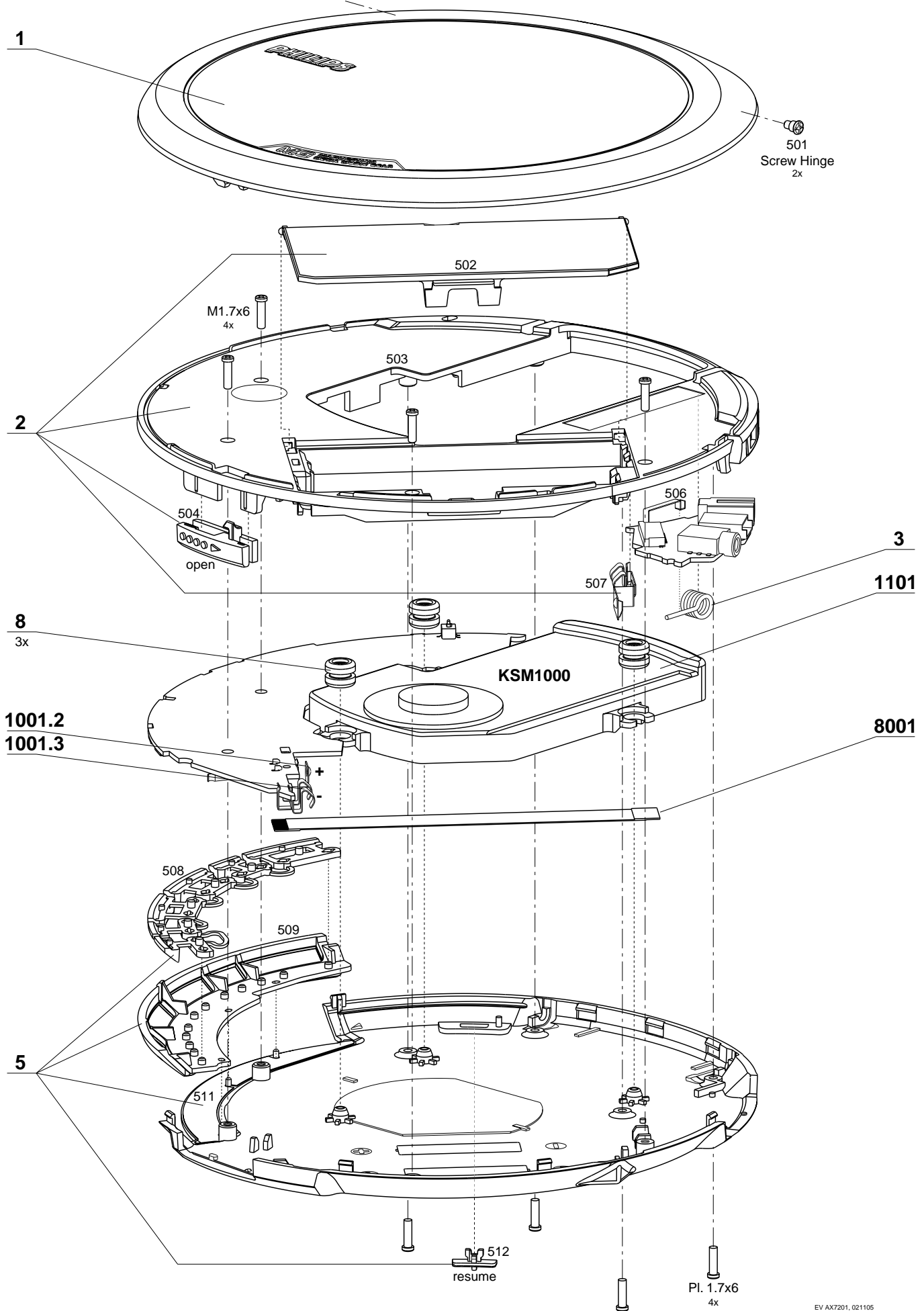
**MAIN BOARD**

**CONNECTOR BOARD**

This assembly drawing shows a summary of all possible versions. For components used in specific versions see circuit diagram.

**EXPLODED VIEW**

**MECHANICAL PARTSLIST**



1	3103 308 13620	CD-DOOR ASSEMBLY
2	3103 308 13631	CABINET ASSEMBLY
3	3103 301 06710	SPRING-OPEN CD DOOR
5	3103 308 13641	BOTTOM ASSEMBLY
8	3103 304 73581	SUSPENSION
1001.2	3103 301 46091	SPRING-BATTERY-PLUS
1001.3	3103 301 46081	SPRING-BATTERY-MINUS
1101	3103 309 05440	CD-DRIVE KSM1000
8001	3103 308 93080	FLEXFOIL CABLE, 14P, 83mm AD

## ELECTRICAL PARTSLIST

## MISCELLANEOUS

1101	3103 309 05440	CD-DRIVE KSM1000
1200 ▲	2422 086 11012	FUSE 0,7A 50V UL
1201	2422 030 00394	EXT. DC SOCKET
1202 ▲	2422 086 11012	FUSE 0,7A 50V UL
1203	2422 025 17428	SOCKET, EXT.BATTERY PACK
1204	2422 025 17861	FFC-CONNECTOR, 14P, SIDE ENTRY
1205	2422 025 17861	FFC-CONNECTOR, 14P, SIDE ENTRY
1300	2422 026 05356	SOCKET, HEADPHONE&RC
1400	2422 127 00547	SLIDE SWITCH, RESUME
1402	2422 025 17817	CONNECTOR, 8P, SIDE ENTRY
1403	2422 128 02975	SWITCH, TACT
1404	2422 128 02975	SWITCH, TACT
1405	2422 128 02975	SWITCH, TACT
1406	2422 128 02975	SWITCH, TACT
1407	2422 128 02975	SWITCH, TACT
1408	2422 128 02975	SWITCH, TACT
1409	2422 128 03066	SWITCH, CD-DOOR
1800	2422 025 17916	FFC-CONNECTOR, 16P, SIDE ENTRY
8001	3103 308 93080	FLEXFOIL CABLE, 14P, 83mm AD

## CAPACITORS

2200 ©	3198 017 41050	1µF	20%	10V
2202 ©	3198 017 41050	1µF	20%	10V
2203 ©	3198 032 15190	100µF	20%	4V
2204 ©	3198 017 41050	1µF	20%	10V
2205 ©	2022 009 00656	47µF	20%	6,3V
2206 ©	3198 032 15190	100µF	20%	4V
2207 ©	4822 124 11946	22µF	20%	16V
2208 ©	2020 552 96305	4,7µF	20%	10V
2209 ©	2022 009 00656	47µF	20%	6,3V
2210 ©	5322 126 11583	10nF	10%	63V
2211 ©	2020 552 96305	4,7µF	20%	10V
2212 ©	3198 032 15190	100µF	20%	4V
2213 ©	3198 017 41050	1µF	20%	10V
2214 ©	2238 586 59812	100nF	10%	50V
2217 ©	3198 017 41050	1µF	20%	10V
2219 ©	3198 035 04710	470pF		50V
2220 ©	2020 552 94427	100pF	5%	50V
2221 ©	3198 017 41050	1µF	20%	10V
2222 ©	2020 552 96624	3,3nF	10%	50V
2224 ©	2238 586 59812	100nF	10%	50V
2300 ©	3198 017 41050	1µF	20%	10V
2301 ©	2020 552 96623	2,2nF	10%	50V
2302 ©	3198 017 41050	1µF	20%	10V
2303 ©	3198 017 41050	1µF	20%	10V
2304 ©	3198 032 28210	220µF	20%	6,3V
2305 ©	4822 126 14491	2,2µF		10V
2306 ©	3198 017 42230	22nF	10%	50V
2307 ©	3198 035 26820	6,8nF		16V
2308 ©	2238 586 59812	100nF	10%	50V
2309 ©	3198 032 28210	220µF	20%	6,3V
2310 ©	4822 126 14491	2,2µF		10V
2311 ©	3198 032 28210	220µF	20%	6,3V
2312 ©	3198 035 26820	6,8nF		16V
2313 ©	3198 017 42230	22nF	10%	50V
2314 ©	3198 017 41050	1µF	20%	10V
2315 ©	2020 552 96623	2,2nF	10%	50V
2316 ©	2020 552 96305	4,7µF	20%	10V
2317 ©	4822 126 13879	220nF	20%	16V
2318 ©	4822 126 13879	220nF	20%	16V
2319 ©	2020 004 90283	10µF	20%	10V

## CAPACITORS

2320 ©	2238 586 59812	100nF	10%	50V
2321 ©	3198 017 41050	1µF	20%	10V
2322 ©	2020 552 96305	4,7µF	20%	10V
2323 ©	4822 126 13879	220nF	20%	16V
2324 ©	3198 017 41050	1µF	20%	10V
2325 ©	2238 586 59812	100nF	10%	50V
2400 ©	2238 586 59812	100nF	10%	50V
2401 ©	2238 586 59812	100nF	10%	50V
2402 ©	2238 586 59812	100nF	10%	50V
2403 ©	2238 586 59812	100nF	10%	50V
2404 ©	4822 126 14549	33nF	10%	16V
2405 ©	4822 126 14549	33nF	10%	16V
2406 ©	2238 586 59812	100nF	10%	50V
2407 ©	4822 126 13879	220nF	20%	16V
2408 ©	2020 552 96623	2,2nF	10%	50V
2409 ©	2020 552 96623	2,2nF	10%	50V
2410 ©	2020 552 96623	2,2nF	10%	50V
2411 ©	3198 017 41050	1µF	20%	10V
2412 ©	2238 586 59812	100nF	10%	50V
2413 ©	4822 124 11946	22µF	20%	16V
2414 ©	4822 124 11946	22µF	20%	16V
2415 ©	2020 552 96305	4,7µF	20%	10V
2416 ©	4822 124 11946	22µF	20%	16V
2417 ©	3198 017 41050	1µF	20%	10V
2418 ©	2020 552 96618	1nF	10%	50V
2419 ©	2020 552 96618	1nF	10%	50V
2420 ©	2020 552 96618	1nF	10%	50V
2800 ©	2238 586 59812	100nF	10%	50V
2801 ©	4822 124 11946	22µF	20%	16V
2802 ©	2238 586 59812	100nF	10%	50V
2803 ©	3198 035 04710	470pF		50V
2804 ©	4822 126 14241	330pF	5%	50V
2805 ©	2020 552 96628	10nF	10%	16V
2806 ©	4822 126 14494	22nF	10%	25V
2807 ©	2238 586 59812	100nF	10%	50V
2808 ©	4822 124 11946	22µF	20%	16V
2809 ©	4822 126 14494	22nF	10%	25V
2810 ©	2020 552 96628	10nF	10%	16V
2811 ©	2238 586 59812	100nF	10%	50V
2812 ©	2020 552 96628	10nF	10%	16V
2813 ©	2020 552 96628	10nF	10%	16V
2814 ©	3198 017 41050	1µF	20%	10V
2815 ©	2020 552 96628	10nF	10%	16V
2816 ©	4822 126 13879	220nF	20%	16V
2817 ©	4822 126 14494	22nF	10%	25V
2818 ©	2020 552 96628	10nF	10%	16V
2819 ©	4822 126 13193	4,7nF	10%	63V
2820 ©	2020 552 96625	3,3nF	10%	50V
2821 ©	2020 552 96628	10nF	10%	16V
2822 ©	2020 552 96628	10nF	10%	16V
2823 ©	2238 586 59812	100nF	10%	50V
2824 ©	3198 024 44730	47nF	5%	50V
2825 ©	2022 009 00656	47µF	20%	6,3V
2826 ©	4822 126 14506	270pF	5%	50V
2827 ©	2238 586 59812	100nF	10%	50V
2828 ©	2222 867 15339	33pF	5%	50V
2829 ©	4822 126 13956	68pF	5%	63V
2831 ©	2238 586 59812	100nF	10%	50V
2832 ©	3198 017 44740	470nF	20%	10V
2833 ©	3198 024 44730	47nF	5%	50V
2834 ©	2022 009 00656	47µF	20%	6,3V
2838 ©	3198 032 15190	100µF	20%	4V
2839 ©	2020 552 96628	10nF	10%	16V
2840 ©	3198 017 44740	470nF	20%	10V

## CAPACITORS

2841	2020 552 96623	2,2nF	10%	50V
2842	2020 552 96623	2,2nF	10%	50V
2843	2238 586 59812	100nF	10%	50V
2844	4822 124 11946	22μF	20%	16V
2845	4822 126 14549	33nF	10%	16V
2846	2238 586 59812	100nF	10%	50V
2848	3198 016 36810	680pF	5%	25V
2849	3198 016 36810	680pF	5%	25V
2850	4822 122 33741	10pF	10%	50V
2851	2238 586 59812	100nF	10%	50V
2852	2238 586 59812	100nF	10%	50V
2853	4822 126 14494	22nF	10%	25V
2854	3198 017 41050	1μF	20%	10V
2855	2020 552 96618	1nF	10%	50V
2857	3198 016 33380	3,3pF	10%	50V
2858	3198 034 04790	47pF		50V
2859	3198 034 04790	47pF		50V
2860	3198 034 01590	15pF		50V
2861	2222 867 15339	33pF	5%	50V
2862	4822 126 14241	330pF		50V

## RESISTORS

3200	2322 706 74703	47kΩ	1%	0,06W
3202	4822 117 13601	22kΩ	5%	0,06W
3203	2322 706 74703	47kΩ	1%	0,06W
3204	2322 706 74703	47kΩ	1%	0,06W
3205	2322 706 76803	68kΩ	1%	0,06W
3206	4822 117 13548	1kΩ	5%	0,06W
3207	4822 117 13548	1kΩ	5%	0,06W
3208	4822 117 13601	22kΩ	5%	0,06W
3209	3198 031 06820	6,8kΩ	5%	0,06W
3210	3198 031 06840	680kΩ	5%	0,06W
3211	2322 706 72204	220kΩ	1%	0,06W
3212	3198 031 04740	470kΩ	5%	0,06W
3213	2322 706 74703	47kΩ	1%	0,06W
3214	4822 117 13601	22kΩ	5%	0,06W
3215	4822 117 13606	10kΩ	5%	0,06W
3216	3198 031 02240	220kΩ	5%	0,06W
3217	4822 117 13606	10kΩ	5%	0,06W
3218	3198 031 03310	330Ω	5%	0,06W
3219	3198 031 04730	47kΩ	5%	0,06W
3220	4822 117 13606	10kΩ	5%	0,06W
3221	2322 704 61204	120kΩ	1%	0,06W
3222	2322 704 61204	120kΩ	1%	0,06W
3223	2322 706 76803	68kΩ	1%	0,06W
3224	2322 706 76803	68kΩ	1%	0,06W
3225	4822 117 13601	22kΩ	5%	0,06W
3226	4822 117 13601	22kΩ	5%	0,06W
3227	4822 117 11297	100kΩ	5%	0,06W
3228	3198 031 08220	8,2kΩ	5%	0,06W
3229	4822 117 13606	10kΩ	5%	0,06W
3230	3198 031 01540	150kΩ	5%	0,06W
3231	4822 117 12917	1Ω	5%	0,06W
3232	4822 117 12917	1Ω	5%	0,06W
3233	4822 117 13545	100Ω	5%	0,06W
3234	4822 116 30467	10kΩ	5%	NTC
3235	3198 031 03340	330kΩ	5%	0,06W
3236	3198 031 06830	68kΩ	5%	0,06W
3237	3198 031 04720	4,7kΩ	5%	0,06W
3238	3198 031 01540	150kΩ	5%	0,06W
3239	4822 117 13606	10kΩ	5%	0,06W
3241	3198 031 03340	330kΩ	5%	0,06W
3242	3198 031 04730	47kΩ	5%	0,06W
3243	3198 031 01830	18kΩ	5%	0,06W

## RESISTORS

3244	3198 031 01830	18kΩ	5%	0,06W
3245	4822 117 13606	10kΩ	5%	0,06W
3246	3198 031 05630	56kΩ	5%	0,06W
3247	3198 031 02240	220kΩ	5%	0,06W
3248	3198 031 04740	470kΩ	5%	0,06W
3249	3198 031 01540	150kΩ	5%	0,06W
3250	3198 031 01030	10kΩ	5%	0,06W
3251	4822 117 13606	10kΩ	5%	0,06W
3252	3198 031 03320	3,3kΩ	5%	0,06W
3253	3198 031 03320	3,3kΩ	5%	0,06W
3254	4822 117 13606	10kΩ	5%	0,06W
3255	3198 031 02240	220kΩ	5%	0,06W
3256	3198 031 04740	470kΩ	5%	0,06W
3300	3198 031 01050	1MΩ	5%	0,06W
3301	3198 031 03320	3,3kΩ	5%	0,06W
3302	4822 117 13546	47Ω	5%	0,06W
3303	3198 031 08220	8,2kΩ	5%	0,06W
3304	4822 117 13596	220Ω	5%	0,06W
3305	3198 031 01530	15kΩ	5%	0,06W
3306	3198 031 02720	2,7kΩ	5%	0,06W
3306	3198 031 05620	5,6kΩ	5%	0,06W
3307	3198 031 03320	3,3kΩ	5%	0,06W
3308	4822 117 13613	2,2Ω	5%	0,06W
3309	3198 031 02710	270Ω	5%	0,06W
3310	3198 031 01830	18kΩ	5%	0,06W
3311	4822 117 13548	1kΩ	5%	0,06W
3312	4822 117 13548	1kΩ	5%	0,06W
3313	4822 117 13548	1kΩ	5%	0,06W
3314	3198 031 02290	22Ω	5%	0,06W
3314	3198 031 02280	2,2Ω	5%	0,06W
3315	4822 117 11297	100kΩ	5%	0,06W
3316	3198 031 02710	270Ω	5%	0,06W
3317	3198 031 01830	18kΩ	5%	0,06W
3318	3198 031 02290	22Ω	5%	0,06W
3318	3198 031 02280	2,2Ω	5%	0,06W
3319	3198 031 03320	3,3kΩ	5%	0,06W
3320	3198 031 02720	2,7kΩ	5%	0,06W
3320	3198 031 05620	5,6kΩ	5%	0,06W
3321	4822 117 11297	100kΩ	5%	0,06W
3322	3198 031 01530	15kΩ	5%	0,06W
3323	4822 117 13548	1kΩ	5%	0,06W
3324	4822 117 13548	1kΩ	5%	0,06W
3325	4822 117 11297	100kΩ	5%	0,06W
3326	3198 031 01090	10Ω	5%	0,06W
3327	3198 031 01090	10Ω	5%	0,06W
3328	4822 117 13548	1kΩ	5%	0,06W
3329	4822 117 13546	47Ω	5%	0,06W
3330	3198 031 03320	3,3kΩ	5%	0,06W
3331	3198 031 01050	1MΩ	5%	0,06W
3332	3198 031 03320	3,3kΩ	5%	0,06W
3333	4822 117 13543	470Ω	5%	0,06W
3334	3198 031 03320	3,3kΩ	5%	0,06W
3335	4822 117 13606	10kΩ	5%	0,06W
3336	4822 117 13613	2,2Ω	5%	0,06W
3400	4822 117 13601	22kΩ	5%	0,06W
3402	3198 031 04730	47kΩ	5%	0,06W
3403	4822 117 13545	100Ω	5%	0,06W
3404	2350 033 10104	4x100kΩ	5%	
3405	2350 033 10473	4x47kΩ	5%	
3406	4822 117 11297	100kΩ	5%	0,06W
3408	3198 031 03330	33kΩ	5%	0,06W
3410	4822 117 13606	10kΩ	5%	0,06W
3411	2350 033 10103	4x10kΩ	5%	
3412	4822 117 13545	100Ω	5%	0,06W

not for /17

/17 only

not for /17

/17 only

not for /17

/17 only

not for /17

/17 only

## RESISTORS

3414©	4822 117 13543	470Ω	5%	0,06W
3417©	4822 117 11297	100kΩ	5%	0,06W
3418©	4822 117 13601	22kΩ	5%	0,06W
3419©	3198 031 01090	10Ω	5%	0,06W
3420©	3198 031 04740	470kΩ	5%	0,06W
3421©	3198 031 04730	47kΩ	5%	0,06W
3422©	3198 031 06820	6,8kΩ	5%	0,06W
3423©	3198 031 06820	6,8kΩ	5%	0,06W
3424©	3198 031 03320	3,3kΩ	5%	0,06W
3425©	3198 031 01230	12kΩ	5%	0,06W
3426©	3198 031 03320	3,3kΩ	5%	0,06W
3427©	3198 031 01230	12kΩ	5%	0,06W
3428©	4822 117 13548	1kΩ	5%	0,06W
3432©	4822 117 13606	10kΩ	5%	0,06W
3433©	3198 031 05630	56kΩ	5%	0,06W
3434©	3198 031 04730	47kΩ	5%	0,06W
3435©	3198 031 01050	1MΩ	5%	0,06W
3436©	3198 031 01050	1MΩ	5%	0,06W
3437©	4822 117 13601	22kΩ	5%	0,06W
3438©	4822 117 13548	1kΩ	5%	0,06W
3439©	4822 117 13548	1kΩ	5%	0,06W
3440©	4822 117 13606	10kΩ	5%	0,06W
3441©	4822 117 13606	10kΩ	5%	0,06W
3442©	4822 117 13548	1kΩ	5%	0,06W
3443©	4822 117 13548	1kΩ	5%	0,06W
3800©	3198 031 08220	8,2kΩ	5%	0,06W
3801©	3198 031 01090	10Ω	5%	0,06W
3802©	3198 031 01220	1,2kΩ	5%	0,06W
3803©	4822 117 13548	1kΩ	5%	0,06W
3804©	4822 117 13548	1kΩ	5%	0,06W
3805©	3198 031 01220	1,2kΩ	5%	0,06W
3806©	3198 031 01220	1,2kΩ	5%	0,06W
3807©	3198 031 04730	47kΩ	5%	0,06W
3808©	3198 031 02730	27kΩ	5%	0,06W
3809©	3198 031 04730	47kΩ	5%	0,06W
3810©	4822 117 13545	100Ω	5%	0,06W
3811©	3198 031 01220	1,2kΩ	5%	0,06W
3812©	3198 031 08220	8,2kΩ	5%	0,06W
3807©	3198 031 04730	47kΩ	5%	0,06W
3813©	3198 031 01830	18kΩ	5%	0,06W
3814©	3198 031 01090	10Ω	5%	0,06W
3815©	4822 117 13601	22kΩ	5%	0,06W
3816©	4822 117 13601	22kΩ	5%	0,06W
3817©	4822 117 13606	10kΩ	5%	0,06W
3818©	4822 117 13602	2,2kΩ	5%	0,06W
3819©	3198 031 02290	22Ω	5%	0,06W
3820©	4822 117 13602	2,2kΩ	5%	0,06W
3821©	3198 031 06810	680Ω	5%	0,06W
3822©	4822 117 13543	470Ω	5%	0,06W
3823©	3198 031 06830	68kΩ	5%	0,06W
3824©	4822 117 11297	100kΩ	5%	0,06W
3825©	3198 031 02710	270Ω	5%	0,06W
3827©	3198 031 02710	270Ω	5%	0,06W
3828©	4822 117 13602	2,2kΩ	5%	0,06W
3829©	3198 031 01510	150Ω	5%	0,06W
3830©	3198 031 02280	2,2Ω	5%	0,06W
3833©	3198 031 05620	5,6kΩ	5%	0,06W
3834©	3198 031 03330	33kΩ	5%	0,06W
3836©	3198 031 03330	33kΩ	5%	0,06W
3837©	3198 031 01830	18kΩ	5%	0,06W
3838©	3198 031 05630	56kΩ	5%	0,06W
3839©	4822 117 13602	2,2kΩ	5%	0,06W
3840©	4822 117 13606	10kΩ	5%	0,06W
3841©	4822 117 13606	10kΩ	5%	0,06W

## RESISTORS

3842©	3198 031 02250	2,2MΩ	5%	0,06W
3843©	4822 117 13606	10kΩ	5%	0,06W
3844©	4822 117 13606	10kΩ	5%	0,06W
3845©	4822 117 13606	10kΩ	5%	0,06W
3846©	4822 117 11297	100kΩ	5%	0,06W
3847©	3198 031 03330	33kΩ	5%	0,06W
3848©	3198 031 03330	33kΩ	5%	0,06W
3849©	3198 031 01590	15Ω	5%	0,06W
3850©	3198 031 01090	10Ω	5%	0,06W
3851©	3198 031 02240	220kΩ	5%	0,06W
3852©	3198 031 03320	3,3kΩ	5%	0,06W
3853©	4822 117 13606	10kΩ	5%	0,06W
3854©	4822 117 13606	10kΩ	5%	0,06W
3855©	3198 031 04740	470kΩ	5%	0,06W
3856©	4822 117 11297	100kΩ	5%	0,06W
3857©	3198 031 02280	2,2Ω	5%	0,06W
4400©	4822 117 13605	CHIP JUMPER	0402	
4807©	4822 117 13605	CHIP JUMPER	0402	
4808©	4822 117 13605	CHIP JUMPER	0402	
4810©	4822 117 13605	CHIP JUMPER	0402	
4812©	4822 117 13605	CHIP JUMPER	0402	

## COILS

1401©	2422 540 98524	CER.RES. 4MHz	
1801	4822 242 10989	CER.RES. 16,9MHz	
5200©	2422 535 96438	33μH	
5201©	2422 535 96438	33μH	
5202©	2422 536 00517	22μH 20%	
5400©	2422 536 00516	100μH 20%	
5800©	4822 157 11074	FILTER BLM11A601	
5801©	4822 157 11074	FILTER BLM11A601	
5802©	4822 157 11074	FILTER BLM11A601	
5803©	2422 549 43769	FILTER BLM11P300SPT	

## DIODES

6201©	4822 130 11397	BAS316	
6202©	4822 130 11397	BAS316	
6203©	9322 185 88685	SL03	
6204©	9322 185 88685	SL03	
6205©	9322 185 88685	SL03	
6300©	4822 130 11551	BZX384-C10	
6301©	4822 130 11551	BZX384-C10	
6302©	9322 185 88685	SL03	
6401©	4822 130 11397	BAS316	
6800©	4822 130 11397	BAS316	

## TRANSISTORS

7200©	3198 010 42320	BC857BW	
7202©	3198 010 44350	BC807-25W	
7205©	9340 425 20115	BC847BS	
7209©	3198 010 42320	BC857BW	
7210©▲	5322 130 61569	BC868	
7211©	3198 010 42310	BC847BW	
7212©▲	9340 219 30115	BC817-25W	
7213©	3198 010 42310	BC847BW	
7300©	9340 425 20115	BC847BS	
7301©	9340 425 30115	BC847BPN	
7302©	9340 219 30115	BC817-25W	
7304©	9340 219 30115	BC817-25W	
7307©	3198 010 42310	BC847BW	
7400©	3198 010 42310	BC847BW	
7404©	9340 425 30115	BC847BPN	
7405©	3198 010 42320	BC857BW	
7805©	9340 425 20115	BC847BS	

## TRANSISTORS

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7807	©	3198 010 44350	BC807-25W
7808	©	9340 425 20115	BC847BS
7809	©	3198 010 42310	BC847BW
7811	©	3198 010 42310	BC847BW

## INTEGRATED CIRCUITS

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7201	©	▲9352 701 07118	TEA1208T/N1, DC/DC-CONVERTER
7203	©	9352 701 07118	TEA1208T/N1, DC/DC-CONVERTER
7204	©	9352 701 07118	TEA1208T/N1, DC/DC-CONVERTER
7207	©	▲9322 185 08668	KF35BD, STABILIZER IC
7208	©	4822 209 80587	LM324N, 4-FOLD OPAMP
7306	©	9322 185 11668	TA2131FL, HEADPHONE AMPLIFIER
7401	©	9322 143 49668	M24C01-RDW6, EEPROM
7402	©	9322 182 28668	BH6541KV, PWM-SERVO DRIVER
7403	©	3103 308 84640	TMP86CM29BU-AX7201, MICRO PROC.
7800	©	9322 186 57668	MSM51X17400F-10TS-K, DRAM
7801	©	9322 182 66671	AN8399SA, HF PRE-AMPLIFIER
7802	©	9322 182 62671	MN662786SB, SERVO&CD DECODER
7804	©	9322 182 63668	SM8613AV, LASER CONTROL

## DOCUMENT HISTORY

### **Version 1.0**

- Initial release