

Portable compact disc player

Service Service Service



AZ9015
AZ9225
AZT9230
all versions

PRODUCT FAMILY DORIS2 – PB3

Service Manual



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PHILIPS



TECHNICAL SPECIFICATION

General

Dimensions (WxHxD)	: 128x33x139mm
Weight without batteries	: 220g

Power supply modes

DC-in socket	: 2.5-6.0V
Primary batteries (2xLR6)	: 1.6-3.6V
Rechargeable batteries (AY3362)	: 1.6-3.6V

Battery lifetime

BATTERY TYPE	CD MODE ESP OFF	CD MODE ESP ON	TUNER MODE
Primary batteries 2 x LR6	≥12h (18h typ.)	≥12h (18h typ.)	≥50h (70h typ.)
Rechargeable batteries AY3362 (1200mAh)	≥7h (10h typ.)	≥7h (10h typ.)	≥25h (35h typ.)

Battery level detection – CD mode

DETECTION LEVEL	Primary batteries	Rechargeable batteries
Battery empty	1.8V +100/-50mV	1.8V +100/-50mV
Battery weak 1	battery empty level + 0.9V ±100mV	battery empty level + 0.7V ±100mV
Battery weak 2	battery empty level + 0.6V ±100mV	battery empty level + 0.5V ±100mV
Battery weak 3	battery empty level + 0.3V ±100mV	battery empty level + 0.3V ±100mV

Battery level detection – Tuner mode

DETECTION LEVEL	Primary batteries	Rechargeable batteries
Battery empty	2.0V +100/-50mV	2.0V +100/-50mV
Battery weak 1	battery empty level + 0.7V ±100mV	battery empty level + 0.5V ±100mV
Battery weak 2	battery empty level + 0.45V ±100mV	battery empty level + 0.35V ±100mV
Battery weak 3	battery empty level + 0.2V ±100mV	battery empty level + 0.2V ±100mV

Current consumption

OPERATION MODE	DC-IN SUPPLY (4.5V)		BATT. SUPPLY (2.25V)	
	ESP OFF	ESP ON	ESP OFF	ESP ON
CD Play mode	100mA typ.	100mA typ.	120mA typ.	120mA typ.
CD Jump mode	220mA typ.	220mA typ.	300mA typ.	400mA typ.
TUNER mode	30mA typ.		30mA typ.	
Stand-by (excl. recharge)	30mA typ.		250µA typ.	

Charge section (not on all versions)

Charge current	: 250mA ±10%
Charge time for 80% AY3362	: 4.0h nom.
Max. charge time (µP controlled)	: 7h
Temperature protection	: 50°C ±5°C

Tuner (not on all versions)

	FM	AM
Tuning range	87.5-108MHz	531-1602kHz 530-1700kHz for /17
IF	10.7MHz	450kHz
Sensitivity 26dB S/N, m=30% -3dB limiting point	≤22dBf (15dBf typ.) ≤26dBf (15dBf typ.)	≤5mV/m (3mV/m typ.)
Frequency grid	100kHz 50kHz for /17	9kHz 10kHz for /17
Distortion	≤7% (2% typ.) rf=1mV, Δf=75kHz	≤7% (2% typ.) rf=1mV, m=80%
Image rejection ratio	≥20dB (25dB typ.)	≥28dB (40dB typ.)

Shock resistance

+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	: 2x6mW (+1/-3dB)
all other versions	: 2x3mW (+1/-3dB)
Frequency response CD (1mW)	: 100Hz-20kHz within 6dB
Frequency response AM (1mW)	: 100Hz-1.5kHz within 6dB
Frequency response FM (1mW)	: 100Hz-12.5kHz within 6dB
S/N ratio CD (unwght)	: ≥80dB (83dB typ.)
S/N ratio CD (A-wght)	: ≥82dB (85dB typ.)
S/N ratio AM (A-wght)	: ≥40dB (45dB typ.)
S/N ratio FM (A-wght)	: ≥45dB (55dB typ.)
THD+N CD (1kHz, 1mW)	: ≤1% (0.2% typ.)
THD+N AM/FM (1kHz, 1mW)	: ≤7% (2% typ.)
Channel crosstalk (1kHz, no load)	: ≤-24dB (-44dB typ.)
Channel unbalance (-40dB)	: ≤5dB
Volume attenuation (1kHz)	: ≥60dB

Dynamic Bass Boost DBB

DBB STAGE	Frequency response		
	63kHz	1kHz	10kHz
DBB 1	+6dB ±2dB	0dB ±2dB	0dB ±2dB
DBB 2	+9dB ±2dB	0dB ±2dB	+5dB ±2dB

Digital output (not on all versions)

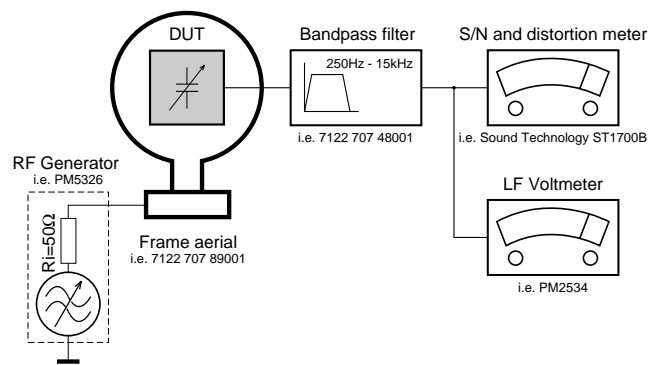
Connector type : 3.5mm optical fiber jack
 Clock precision : level II (± 1000 ppm)
 Specification according to IEC958, accuracy mode "normal".

Laser

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

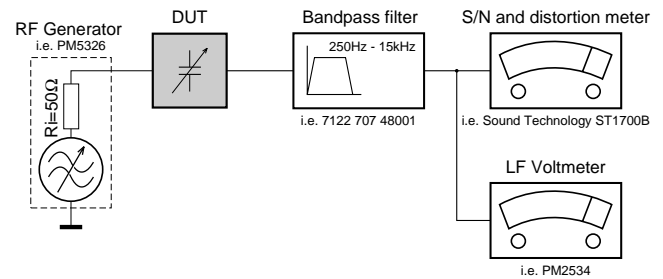
Measurement setup AM

To avoid atmospheric interference all AM measurements have to be carried out in a Faraday's cage.
 Use bandpass filter (or at least a high pass filter with 250Hz) to eliminate hum (50Hz, 100Hz).



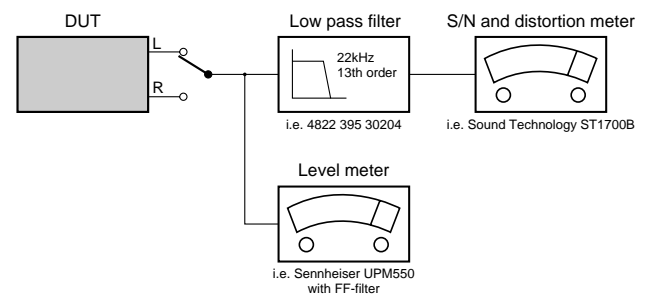
Measurement setup FM

Use bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from pilot tone (19kHz, 38kHz).



Measurement setup CD

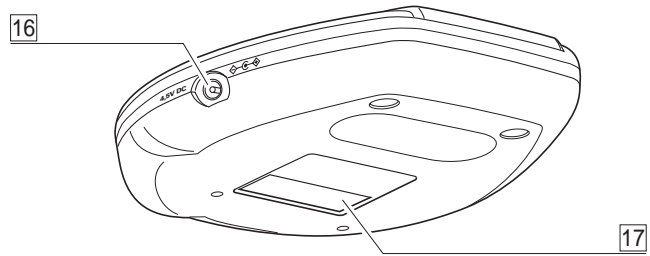
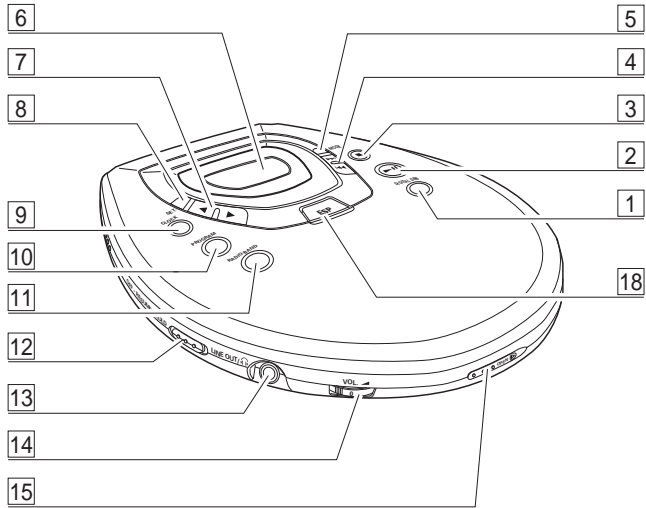
Use Audio Signal disc SBC429 4822 397 30184



FEATURE OVERVIEW

FEATURES OF CD-PORTABLE PRODUCT FAMILY "DORIS2 – PB3"	AZ9015 (all versions)	AZ9225 (all versions)	AZT9230 (all versions)
TUNER FM / MW / SW	- / - / -	- / - / -	● / ● / -
CD-REWRITABLE COMPATIBILITY	●	●	●
ELECTRONIC SKIP PROTECTION	12s	45s	45s
ESP DRAM SIZE	4Mbit	16Mbit	16Mbit
HOLD / RESUME FUNCTION	● / ●	● / ●	● / ●
DBB STAGES	3	3	3
ACOUSTIC FEEDBACK	●	●	●
PROGRAM MEMORY	99	99	99
RECHARGE FUNCTION NiCd / NiMH	● / ●	● / ●	● / ●
CORD REMOTE CONTROL PREPARED	●	●	-
DISPLAY BACKLIGHT	-	●	-
LINE / DIGITAL OUTPUT	- / ●	- / ●	- / -

CONNECTIONS AND CONTROLS



- 1 **DIGITAL DBB** ... **DIGITAL DYNAMIC BASS BOOST**
switches the bass enhancement on and off
- 2 **▶||** switches the player on, starts or pauses CD play
- 3 **■** stops CD play, clears a CD program or switches the player off
- 4 **▶▶** skips and searches CD tracks forwards, selects the next preset radio station
◀◀ skips and searches CD tracks backwards, selects the previous preset radio station
- 5 **MODE** selects the different playing possibilities: shuffle, shuffle repeat all, repeat, repeat all and *SCAN*
- 6 display
- 7 **▲** tunes to radio stations upwards, sets the time upwards
▼ tunes to radio stations downwards, sets the time downwards
- 8 **SET** activates / confirms the current time setting, activates / confirms the alarm time setting

- 9 **CLOCK** switches to clock or alarm clock display
- 10 **PROGRAM** programs CD tracks and radio stations, reviews the program
- 11 **RADIO-BAND** ... switches the radio on, selects a waveband
- 12 **RESUME** stores the last position of a CD track played
HOLD locks all buttons
OFF switches RESUME and HOLD off
- 13 **LINE OUT** / 3.5 mm headphone socket, socket to connect the player to another analogue audio input of an additional appliance, remote control socket
- 14 **VOL** adjusts the volume
- 15 **OPEN** **▶** opens the CD lid
- 16 **4.5V DC** socket for external power supply
- 17 typeplate
- 18 **ESP** **ELECTRONIC SKIP PROTECTION**
ensures continuous CD playback regardless of vibrations and shocks, switches the alarm function on and off

INSTRUCTION FOR USE (excerpt)

Programming track numbers

You can select up to 99 tracks and store them in memory in a desired sequence. Any track can be stored more than once.

- 1 While playback is stopped, select a track with ◀◀ or ▶▶.
 - 2 Press PROGRAM to store the track.
 - PROGRAM lights up; the track number programmed and P with the total number of stored tracks are displayed.
 - 3 Select and store all desired tracks in this way.
 - 4 Press ▶▶ to start playback of your selected tracks.
 - PROGRAM is shown and playback starts.
- You can review the program by pressing PROGRAM for more than 2 seconds.
 - The display shows all stored tracks in sequence.

Notes:

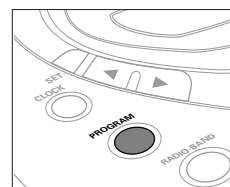
- If you press PROGRAM and there is no track selected, SELECE is displayed.
- If you try to store more than 99 tracks, FULL is displayed.

Clearing the program

- 1 If necessary, press ■ to stop playback.
- 2 Press ■ to clear the program.
 - CLEAR is displayed once, PROGRAM goes off and the program is cleared.

Notes:

- The program will also be cleared if you
 - interrupt the power supply or
 - open the CD lid.



Radio play

You can tune to any FM or MW station automatically or manually. Stereo stations are indicated by ST.

- 1 Press RADIO-BAND to switch the radio on.
- 2 Press RADIO-BAND if necessary repeatedly to select the desired waveband.
 - FM 1, FM 2, FM 3, FM 4 or MW is shown.

Tuning to radio stations automatically

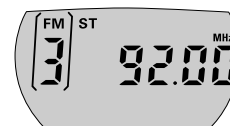
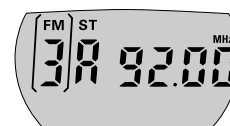
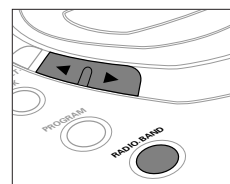
- 1 Keep ▲ or ▼ pressed for at least 1 second.
 - The radio tunes to a station with sufficient strength and radio play starts.
 - ⏪ (for "automatic search") and the current waveband and frequency are displayed.
- 2 Repeat searching until you find the desired radio station.

Tuning to radio stations manually

- 1 Keep ▲ or ▼ pressed.
- 2 Release ▲ or ▼, then briefly press ▲ or ▼ again when you are close to the desired frequency.
- 3 Briefly press ▲ or ▼ repeatedly until you reach the desired frequency.
 - Radio play starts. The current waveband and frequency are displayed.

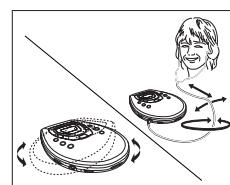
- To switch from radio play to CD play press ▶▶.
- Press ■ to switch the radio off.

Note: In case of interferences in stereo mode press -MODE to switch to mono.



Antennas

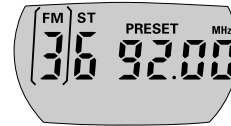
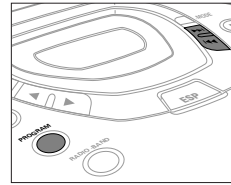
- FM: The headphone wire is used as FM antenna. If necessary move it for optimum reception.
- MW: The internal MW antenna is directed by turning the player.



Storing radio stations

You can store up to 30 radio stations.

- 1 Tune to a desired radio station and press PROGRAM.
- 2 Press ◀ or ▶ if necessary repeatedly to select the number that should be assigned to this radio station.
- 3 Press PROGRAM while PRESET is blinking to confirm the storing.
 - PRESET, the waveband, the frequency and the preset number of the stored station are displayed.
- 4 Store all desired stations this way.



Note: Already stored stations can be recognized by the indicator PRESET and the preset number.

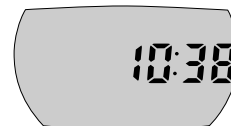
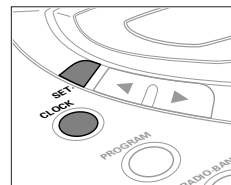
Tuning to a stored radio station

- 1 Select the waveband.
- 2 Press ◀ or ▶ if necessary repeatedly to select the preset number of the desired radio station.
 - Radio play starts. PRESET, the waveband, the frequency and the preset number of the stored station are displayed.

Time setting

Your player has a built-in clock. However CD or tuner play is not conditional upon the time setting.

- 1 Keep SET- pressed for approximately 2 seconds.
 - The clock digits 00:00 flash.
 - 2 Keep ▲ or ▼ pressed, then briefly press ▲ or ▼ again repeatedly within 5 seconds to set the current time.
 - The current time is displayed.
 - 3 Press SET- three times or do not press any key for 5 seconds.
 - The current time is set and the time display goes off.
- To switch to the clock display during CD or tuner play, press CLOCK.
 - The current time is displayed for 5 seconds.



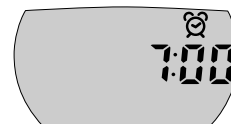
Notes:

- When the player is supplied by batteries do not remove the batteries during radio play, otherwise time settings will be lost and will have to be readjusted.
- If the power supply is interrupted for longer than 1 minute, all time settings will be lost and will have to be readjusted.

Alarm time setting

Provided the current time has been set, your player can be used as an alarm clock.

- 1 Keep SET- pressed for approximately 2 seconds, then briefly press SET- again.
 - AL is displayed and the alarm clock digits 00:00 flash.
 - 2 Press ▲ or ▼ repeatedly within 5 seconds to set the alarm time.
 - is shown and the alarm time is displayed.
 - 3 Press SET- twice or do not press any key for 5 seconds.
 - The alarm time is set and the alarm display goes off.
- To switch to the alarm clock display during CD or tuner play, press CLOCK twice.
 - is shown and the alarm time is displayed for 5 seconds.



Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
No power, playback does not start	Batteries Batteries inserted incorrectly	Insert the batteries correctly
	Batteries are empty	Change the batteries
	Contact pins are dirty	Clean them with a cloth
	Mains adapter Loose connection	Connect the adapter securely
In-car use Cigarette lighter is not powered when ignition is off		Switch on ignition or insert batteries
<i>no disc</i> indication	CD-RW (CD-R) is not recorded properly	Use FINALIZE on the CD Recorder to complete the recording
<i>no disc</i> indication	The CD is badly scratched or dirty	Replace or clean the CD
	CD is not or incorrectly inserted	Insert a CD, label upwards
	The laser lens is steamed up	Wait until the lens has cleared
<i>Hold</i> indication and/or no reaction to controls	HOLD is activated	Deactivate Hold
	Electrostatic discharge	Disconnect the set from power supply or take out the batteries for a few seconds
CD skips tracks	The CD is damaged or dirty	Replace or clean the CD
	RESUME, SHUFFLE or PROGRAM is active	Switch RESUME, SHUFFLE or PROGRAM off
No sound or bad sound quality	PAUSE is activated	Press ►
	Loose, wrong or dirty connections	Check and clean connections
	Volume is not adjusted	Adjust the volume
	Malfunctions due to vicinity of active mobile phones	Keep the player away from active mobile phones
	Strong magnetic fields near the player	Change the player's position or connections
	In-car use Cassette adapter is inserted incorrectly	Insert the cassette adapter correctly
	Temperature inside the car is too high/low	Let the player adjust to the temperature
	Cigarette lighter socket is dirty	Clean the cigarette lighter socket
Wrong playback direction of the car cassette player's autoreverse feature	Change the autoreverse direction	
Poor radio reception	Weak radio signal	Direct the antenna for optimum reception
	Interference caused by electric equipment like TVs, computers, engines etc.	Keep the player away from electric equipment
Alarm does not work	Alarm time is not set / alarm is not activated	Set the alarm time / activate the alarm
Malfunctions, loss of time settings	Continued operation with weak batteries	Change batteries, readjust settings

ACCESSORIES

ACCESSORIES FOR CD-PORTABLE PRODUCT FAMILY "DORIS2 – PB3"		AZ9015	AZ9225					AZT9230					
		/00	/00	/05	/11	/17	/00	/01	/10	/11	/17	/19	
AY3170/00 AC/DC Adaptor	4822 219 10617	X	X										
AY3170/05 AC/DC Adaptor	4822 219 10672			X									
AY3170/12 AC/DC Adaptor	4822 219 10671				X								
AY3170/17 AC/DC Adaptor	4822 219 10616					X							
AYT3170/00 AC/DC Adaptor	3140 118 32710						X						
AYT3170/02 AC/DC Adaptor	3140 118 32720							X					
AYT3170/10 AC/DC Adaptor	3140 118 32730								X				
AYT3170/12 AC/DC Adaptor	3140 118 32740									X			
AYT3170/17 AC/DC Adaptor	3140 118 32750										X		
AYT3170/19 AC/DC Adaptor	local supplier												X
AY3362/00 Rechargeable battery NiMH	3103 308 84120	X	X	X	X	X	X	X	X	X	X		X
AY3501/00 Car Adaptor Cassette	4822 397 10059	O	O	O	O	O	O	O	O	O	O	O	O
AY3545/00 Car DC/DC Converter	4822 219 10033	O	O	O	O	O	O	O	O	O	O	O	O
AY3677/00 Earphone (L-plug)	4822 242 11004						X	X	X	X			X
AY3677/00S Earphone (straight plug)	4822 242 11021	X	X	X	X								
AY3682/00 Headphone (L-plug)	4822 242 11003										X		
SBC HP540/00M Headphone (straight plug)	12NC follows					X							
AY3767/00 Cord Remote Control	3103 309 72380	X	X	X	X	X							
AY3464 HIFI CORD (3.5mm → cinch, L-plug)	4822 320 11881	O	O	O	O	O	O	O	O	O	O	O	O
SBC1270 Optical Fiber (3.5mm → TosLink)	4822 321 62732	O	O	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.

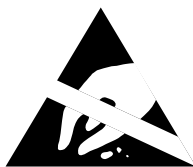
ⓕ ATTENTION

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.

ESD



ⓓ WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatistischen 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 electrostatistische 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 braccialeto 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, 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

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 ⚠

SAFETY



ⓓ

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

Sicherheitsbauteile sind durch das Symbol ⚠ markiert.

Ⓝ

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

Ⓢ

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

Componenti di sicurezza sono marcati con ⚠

ⓐ **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.

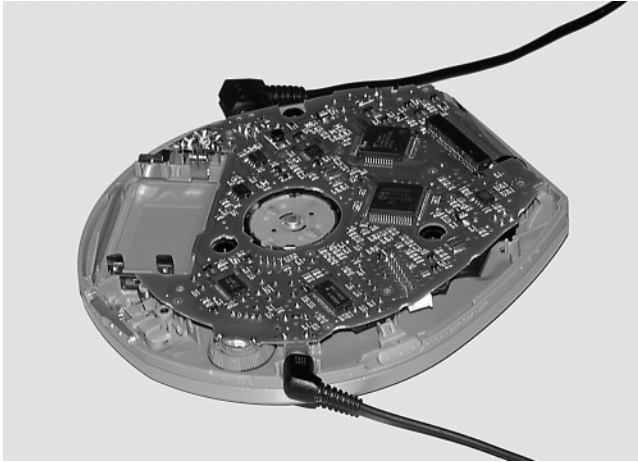
The leakage current must not exceed 0.5mA.

ⓕ

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

SERVICE HINTS

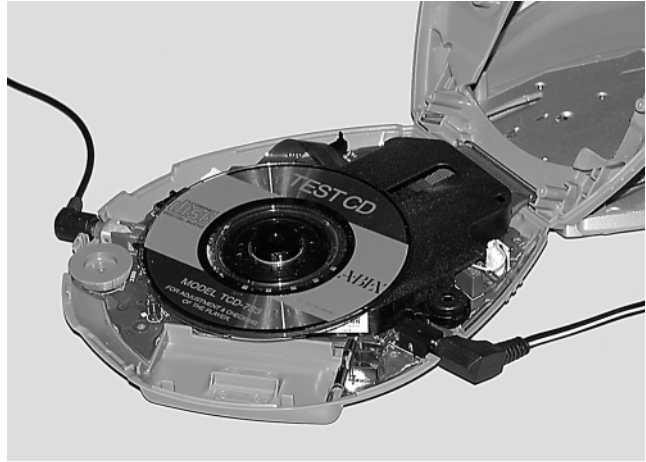
REPAIR POSITION COPPERSIDE



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

1. Remove the bottom screws (6x)
2. Lift the bottom-cabinet
3. Supply the unit via external DC-socket
4. Take care that the door switch is closed during measurements

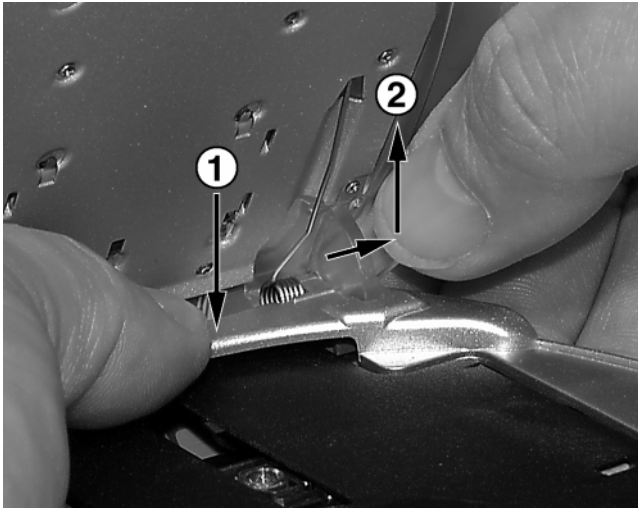
REPAIR POSITION COMPONENTSIDE



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

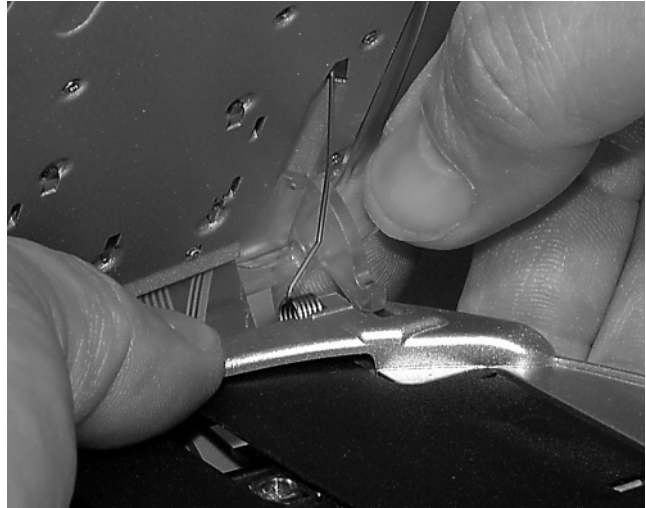
1. Remove the bottom screws (6x)
2. Open the CD-door
3. Lift the top-cabinet and put it backwards on the table
4. Supply the unit via the external DC-socket
5. Take care that the door switch is closed during measurements

DISMANTLING THE CD-DOOR



To dismantle the CD-door proceed as follows:

1. Disconnect the membrane keyboard (flex-foil connector on copperside of printed board)
2. Smoothly bend the bridge of the cabinet downwards as shown in ①. Take care not to touch the lens
3. Smoothly pull out the right hinge of the CD-door as shown in ②.
4. Lift the CD-door



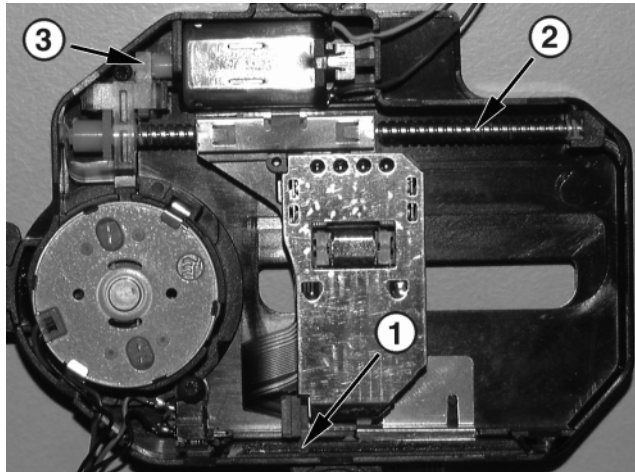
Remark: Do not use screwdrivers or tools like that. Sharp edges could damage hinge or cabinet part.

VAM2103/08 – DRIVE CLEANING & LUBRICATION

Lubrication of the CD-drive is only necessary in case of symptom “skipping tracks”.
The reason can be dirt which sticks to the grease or the grease is getting aged.

Use an acid-free synthetic grease – i.e. “Tribol 9890-2” or equivalent.

Before greasing the mechanism first remove the old grease from the mechanism. Use a cotton swab dipped in alcohol to clean the mechanism.

**Cleaning the mechanism**

1. Clean the lower and upper sledge guidance plane (optical pick-up).
2. Clean the spindle shaft.
3. Clean the area between the worm gear, idler wheel and clamping spring.

Lubricating the mechanism

1. Put one dot of grease onto the upper sledge guidance plane on each side of the sledge. Move the sledge to the inner and outer position to spread the grease.
Put one dot of grease onto the lower sledge guidance plane on each side of the sledge. Move the sledge to the inner and outer position to spread the grease.
2. Put one dot of grease onto the spindle shaft on both sides of the sledge. Move the sledge to the inner and outer position to spread the grease.
3. Put one dot of grease between the worm gear and the clamping spring.

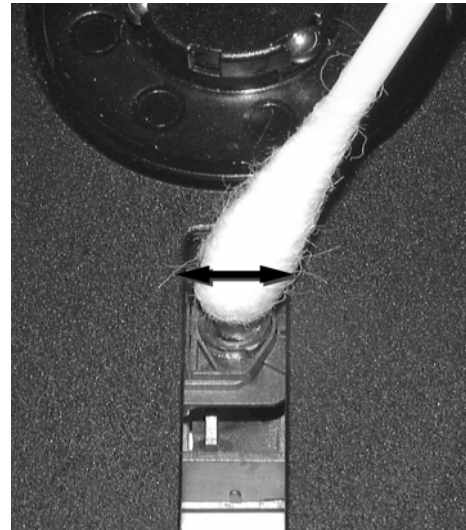
VAM2103/08 – LENS CLEANING

Before touching the lens it is advised to clean the surface of the lens by blowing clean air over it in order to avoid that little particles make scratches on the lens.

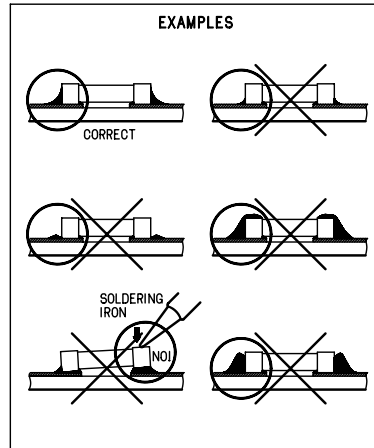
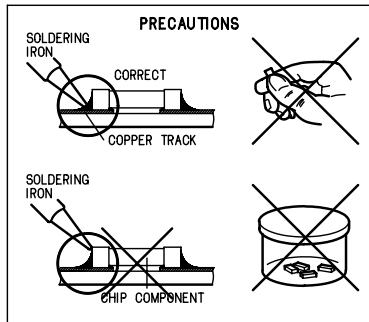
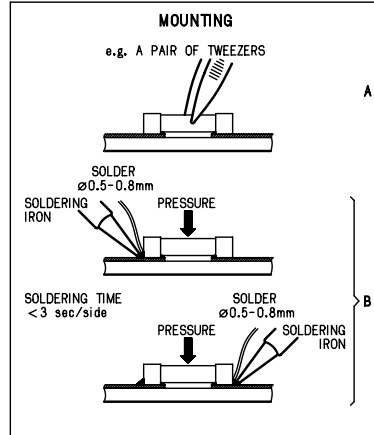
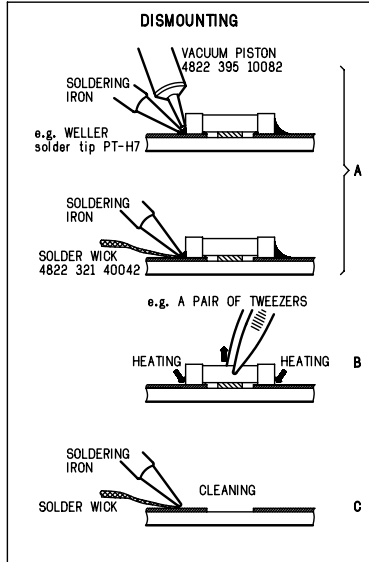
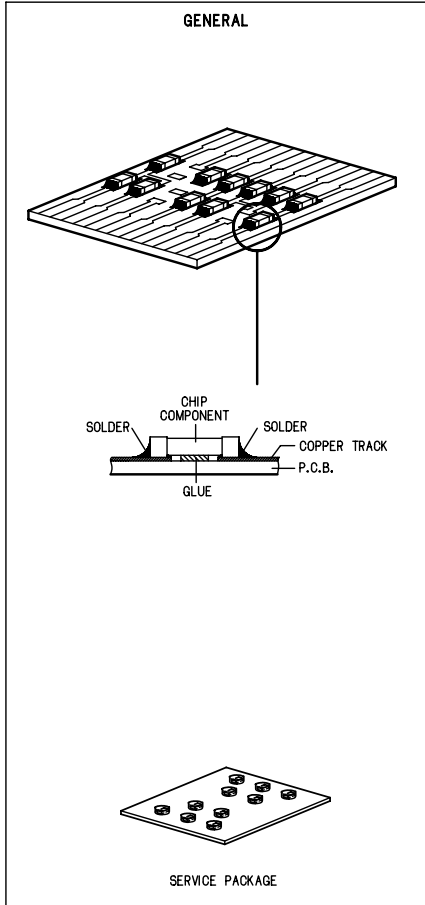
Because the material of the lens is synthetic and coated with a special anti-reflectivity layer, cleaning must be done with a non-aggressive cleaning fluid. It is advised to use “KODAK LENS CLEANER CAT 176 71 36”, available in normal photo shops.

The actuator is a very precise mechanical component and may not be damaged in order to guarantee its full function. It is advised to clean the lens gently (don't press too hard) with a soft and clean cotton bud moistened with the special lens cleaner.

The direction of cleaning must be in the way as indicated in the picture below.



HANDLING CHIP COMPONENTS



SERVICE TOOLS

Audio signal disc SBC429

Playability test disc SBC444

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

4822 397 30184

4822 397 30245

4822 397 30096

ESD PROTECTION EQUIPMENT

Anti-static table mat large 1200x650x1.25mm

small 600x650x1.25mm

4822 466 10953

4822 466 10958

Anti-static wristband

4822 395 10223

Connection box (3 press stud connections, 1MΩ)

4822 320 11307

Extendible cable (2m, 2MΩ, to connect wristband to connection box)

4822 320 11305

Connecting cable (3m, 2MΩ, to connect table mat to connection box)

4822 320 11306

Earth cable (1MΩ, to connect any product to mat or to connection box)

4822 320 11308

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

4822 310 10671

Wristband tester

4822 344 13999

PIN DESCRIPTION OF INTEGRATED CIRCUITS

TDA1300T – HF-PREAMPLIFIER AND LASER SUPPLY CIRCUIT (part of CD-drive VAM2103/08)

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	O4	HF-preamp → CD10	output of current amplifier 4
2	O6	HF-preamp → CD10	output of current amplifier 6
3	O3	HF-preamp → CD10	output of current amplifier 3
4	O1	HF-preamp → CD10	output of current amplifier 1
5	O5	HF-preamp → CD10	output of current amplifier 5
6	O2	HF-preamp → CD10	output of current amplifier 2
7	LDON	CD10 → HF-preamp	control pin for switching the laser on/off
8	VDDL	+2.7	laser supply voltage
9	VRFE	HF-preamp →	equalized output voltage of sum signal of amplifiers 1...4
10	VRF	HF-preamp →	unequalized output
11	HG	GND	control pin for gain switch
12	LS	CD10 → HF-preamp	control pin for double speed switch (switches equalization)
13	C	external connection	external capacitor (bandwidth of ALPC)
14	ADJ	→ HF-preamp	reference input
15	GND	GND	0V supply, substrate connection
16	LO	HF-preamp → laser diode	current output to laser diode
17	MI	monitor diode → HF-preamp	laser monitor diode input
18	VDD	+3	positive supply voltage
19	I2	GND	photo detector input 2 (not used)
20	I5	diode array → HF-preamp	photo detector input 5 (satellite)
21	I1	diode array → HF-preamp	photo detector input 1 (central)
22	I3	diode array → HF-preamp	photo detector input 3 (central)
23	I6	diode array → HF-preamp	photo detector input 6 (satellite)
24	I4	diode array → HF-preamp	photo detector input 4 (central)

MPC17A51VM – 4-CHANNEL H-BRIDGE SERVODRIVER

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	VG	servo driver →	charge pump output, supply for pre-driver circuit
2	DGND	GND	digital ground for control circuit
3	CLK	→ servo driver	clock signal input
4	OE	→ servo driver	output enable
5	VLG	+2.7	power supply input for control circuit
6	VIN12	+A	power supply input for CH1 and CH2 H-bridge driver block
7	OUT1A	servo driver → focus actuator	CH1 H-bridge output A
8	PGND1	GND	power ground for CH1 H-bridge driver block
9	OUT1B	servo driver → focus actuator	CH1 H-bridge output B
10	OUT2B	servo driver → track actuator	CH2 H-bridge output B
11	PGND2	GND	power ground for CH2 H-bridge driver block
12	OUT2A	servo driver → track actuator	CH2 H-bridge output A
13	VIN1-2	+A	power supply input for CH1 and CH2 H-bridge driver block
14	CF2	→ servo driver	CH2 capacitor connection for phase compensation
15	ERR2	CD10 → servo driver	CH2 error level input (radial error signal)
16	ERR1	CD10 → servo driver	CH1 error level input (focus error signal)
17	CF1	→ servo driver	CH1 capacitor connection for phase compensation
18	VR	+1.4	reference voltage input
19	AGND	GND	analog ground for control circuit
20	CF3	→ servo driver	CH3 capacitor connection for phase compensation
21	ERR3	CD10 → servo driver	CH3 error level input (slide error signal)
22	ERR4	CD10/μP → servo driver	CH4 error level input (disc motor speed error signal)
23	CF4	→ servo driver	CH4 capacitor connection for phase compensation
24	VIN3-4	+A	power supply input for CH3 and CH4 H-bridge driver block
25	OUT4A	servo driver → disc motor	CH4 H-bridge output A
26	PGND4	GND	power ground for CH4 H-bridge driver block
27	OUT4B	servo driver → disc motor	CH4 H-bridge output B
28	OUT3B	servo driver → slide motor	CH3 H-bridge output B
29	PGND3	GND	power ground for CH3 H-bridge driver block
30	OUT3A	servo driver → slide motor	CH3 H-bridge output A
31	VIN34	+A	power supply input for CH3 and CH4 H-bridge driver block
32	VCG	+2.7	power supply input for charge pump circuit
33	C2L	→ servo driver	capacitor connection for charge pump
34	C1L	→ servo driver	capacitor connection for charge pump
35	C1H	→ servo driver	capacitor connection for charge pump
36	C2H	→ servo driver	capacitor connection for charge pump

SAA7324 – DECODER, DIGITAL SERVO IC AND D/A-CONVERTER CD10 (low voltage version)

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	HFREF	→ CD10	comparator common mode input
2	HFIN	→ CD10	comparator signal input
3	ISLICE	CD10 →	current feedback from data slicer
4	VSSA1	GND	analog ground 1
5	VDDA1	+2.7	analog supply voltage 1
6	IREF	CD10 →	reference current output pin
7	VRIN	CD10 →	reference voltage for servo ADC's
8	D1	HF-preamp → CD10	unipolar current input (central diode signal input)
9	D2	HF-preamp → CD10	unipolar current input (central diode signal input)
10	D3	HF-preamp → CD10	unipolar current input (central diode signal input)
11	D4	HF-preamp → CD10	unipolar current input (central diode signal input)
12	R1	HF-preamp → CD10	unipolar current input (satellite diode signal input)
13	R2	HF-preamp → CD10	unipolar current input (satellite diode signal input)
14	VSSA2	GND	analog ground 2
15	CROUT	CD10 → X-TAL	crystal/resonator output
16	CRIN	X-TAL → CD10	crystal/resonator input
17	VDDA2	+2.7	analog supply voltage 2
18	LN	CD10 →	DAC left channel differential output - negative
19	LP	CD10 →	DAC left channel differential output - positive
20	VNEG	GND	DAC negative reference input
21	VPOS	+2.7	DAC positive reference input
22	RN	CD10 →	DAC right channel differential output - negative
23	RP	CD10 →	DAC right channel differential output - positive
24	SELPLL	+2.7	selects whether internal clock multiplier PLL is used
25	TEST1	GND	test control input 1; this pin should be tied low
26	CL16	CD10 →	16.9344 MHz system clock output
27	DATA	CD10 → NPC	serial data output (3-state)
28	WCLK	CD10 → NPC	word clock output (3-state)
29	SCLK	CD10 → NPC	serial bit clock output (3-state)
30	EF	CD10 →	C2 error flag output (3-state)
31	TEST2	GND	test control input 2; this pin should be tied low
32	KILL	CD10 →	kill output (programmable; open-drain)
33	VSSD1	GND	digital ground 2
34	V2/V3	CD10 → NPC	versatile I/O: input versatile pin 2 or output versatile pin 3 (open-drain)
35	WCLI	NPC → CD10	word clock input (for data loopback to DAC)
36	SDI	NPC → CD10	serial data input (for data loopback to DAC)
37	SCLI	NPC → CD10	serial bit clock input (for data loopback to DAC)
38	RESETn	NPC → CD10	power-on reset input (active low)
39	SDA	µP ↔ CD10	microcontroller interface data I/O line (open-drain output)
40	SCL	µP → CD10	microcontroller interface clock line input
41	RAB	µP → CD10	microcontroller interface R/W and load control line input (4-wire bus mode)
42	SILD	µP → CD10	microcontroller interface R/W and load control line input (4-wire bus mode)
43	STATUS	CD10 →	servo interrupt request line/decoder status register output (open-drain)
44	TEST3	GND	test control input 3; this pin should be tied low
45	RCK	→ CD10	subcode clock input
46	SUB	CD10 →	P-to-W subcode bits output (3-state)
47	SFSY	CD10 → µP	subcode frame sync output (3-state)
48	SBSY	CD10 → NPC	subcode block sync output (3-state)
49	CL11/4	CD10 →	11.2896 MHz or 4.2336 MHz (for microcontroller) clock output
50	VSSD2	GND	digital ground 3
51	DOBM	CD10 → OPTICAL OUTPUT	bi-phase mark output (externally buffered; 3-state)
52	VDDD1P	+2.7	digital supply voltage 2 for periphery
53	CFLG	CD10 →	correction flag output (open-drain)
54	RA	CD10 → servo driver	radial actuator output
55	FO	CD10 → servo driver	focus actuator output
56	SL	CD10 → servo driver	slide control output
57	VDDD2C	+2.7	digital supply voltage 3 for core
58	VSSD3	GND	digital ground 4
59	MOTO1	CD10 → servo driver	motor output 1; versatile (3-state)
60	MOTO2	CD10 →	motor output 2; versatile (3-state)
61	V4	CD10 → HF-EQ switch	versatile output pin 4
62	V5	CD10 → HF-GAIN switch	versatile output pin 5
63	V1	innerswitch → CD10	versatile input pin 1
64	LDON	CD10 → HF-preamp	laser drive on output (open-drain)

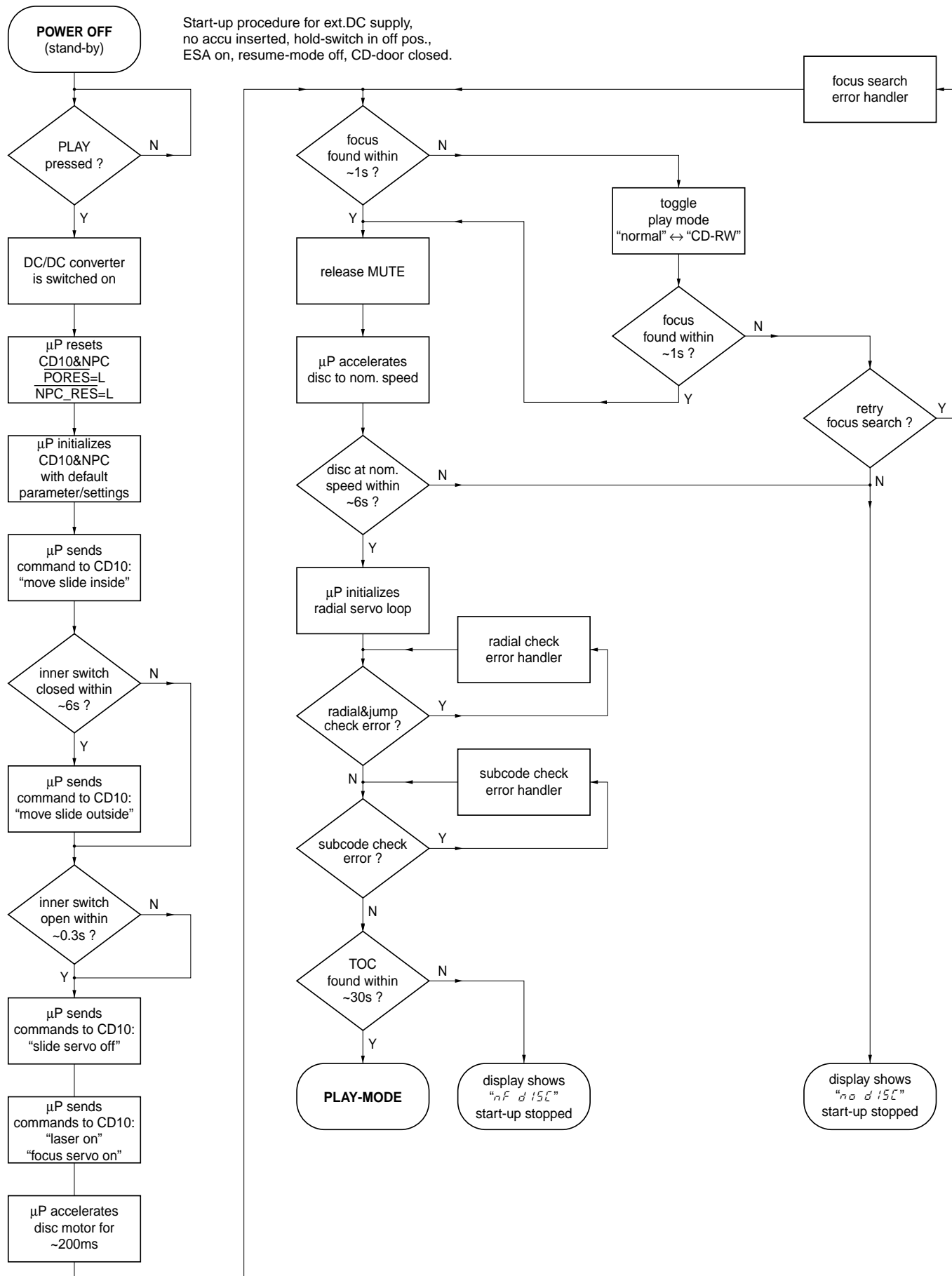
SM5903BF – COMPRESSION-TYPE ANTI-SHOCK MEMORY CONTROLLER NPC

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	VDD2	+2.7	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	NC	NPC →	digital audio interface output
8	NTEST	+2.7	test pin
9	CLK	CD10 → NPC	16.9344MHz clock input
10	VSS	GND	ground
11	YSRDATA	CD10 → NPC	audio serial data input
12	YLRCK	CD10 → NPC	audio serial L/R clock input
13	YSCK	CD10 → NPC	audio serial bit clock input
14	ZSCK	NPC → CD10	audio serial bit clock output
15	ZLRCK	NPC → CD10	audio serial L/R clock output
16	ZSRDATA	NPC → CD10	audio serial data output
17	YFLAG	CD10 → NPC	signal processor IC RAM overflow flag
18	YFCLK	GND	crystal-controlled frame clock input
19	YBLKCK	CD10 → NPC	subcode block clock signal output
20	RESET	μP → NPC	system reset input (active low)
21	ZSENSE	NPC → μP	μP interface status output
22	VDD1	+2.7	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

TA2120FN – Stereo Headphone Amplifier

<i>Pin</i>	<i>Name</i>	<i>Direction</i>	<i>Description</i>
1	DBB NF	→ headphone-amp	NF of DBB amplifier
2	ADD OUT	headphone-amp →	output of ADD amplifier
3	RF IN	→ headphone-amp	terminal for ripple filter circuit
4	PWC	→ headphone-amp	center amplifier on/off switch (open = on)
5	VCC	+A	positive supply voltage
6	B	headphone-amp → HP-socket	output of power amplifier
7	C	headphone-amp → HP-socket	output of center amplifier
8	A	headphone-amp → HP-socket	output of power amplifier
9	GND	GND	ground of power amplifier
10	MIX OUT	headphone-amp →	output of power amplifier (mixed)
11	ALC IN	→ headphone-amp	input terminal for ALC detector circuit
12	ALC DET	→ headphone-amp	smoothing for ALC detection (GND = ALC off, open = ALC ON)
13	ATT	→ headphone-amp	power amplifier gain switch (open/VCC = ATT off, GND = ATT on)
14	IN A	→ headphone-amp	input of power amplifier
15	IN B	→ headphone-amp	input of power amplifier
16	GND	GND	ground of input stage in power amplifier
17	BEEP IN	μP → headphone-amp	input terminal for beep sound
18	MUTE TC	→ headphone-amp	terminal for mute smoothing
19	MUTE SW	μP → headphone-amp	power mute switch (GND/open = mute off, VCC = mute on)
20	POWER	→ headphone-amp	power switch (VCC = power on, GND/open = power off)
21	BIAS	headphone-amp →	BIAS voltage
22	BIAS IN	→ headphone-amp	filter terminal for BIAS circuit
23	DBB SW	μP → headphone-amp	DBB on/off switch (open/VCC = DBB on, GND = DBB off)
24	DBB OUT	headphone-amp →	Output of DBB amplifier (terminal for filter)

START-UP PROCEDURE – FLOW CHART



SERVICE TEST PROGRAM

1. PRELIMINARY SETUP

- To enter the service test program open the CD-door and hold the buttons "PREVIOUS" & "STOP" depressed while turning POWER ON (i.e. connecting the AC/DC adaptor).
- The display shows the software version of the built-in μP (i.e. "5 - 13"). 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 description of available tests below).
- To exit the 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 the 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 and cord remote control.

- To enter the key test start the service test program and press the "MODE" button.
- The display shows "- -".
- Hold key depressed and check corresponding key code. 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. TUNER TEST (not on all versions)

Purpose: Load tuner presets with service frequencies.

- To enter the key test start the service test program and press the "RADIO" button.
- The display shows the tuner version ("EUROPE" resp. "USA").

Note: The tuner version can be toggled by pressing buttons other than "Radio" and "STOP". Be aware that toggling versions will also toggle the tuning grid (9/10kHz). The tuner version will not be restored when leaving the service test program!

- To load the tuner presets with the default service frequencies press the "RADIO" button. Service frequencies can be found in table2 (see flow chart on next page).
- To exit the tuner test and return to the main menu press the "STOP" button.

5. PLAYBACK TEST WITH ERROR ANALYSIS

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

- To enter the playback test start the service test program and press the "DBB" button.
- To start the error analysis press the "PLAY" button. Note that the playback test can only be entered if the CD-door is closed.
- The set will read the TOC and start playback.

As long as the playback is free of errors the display shows track and time information like in normal play-mode. In case of errors corresponding error codes will be displayed. The meaning of these error codes can be found in table3 (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.

6. SERVO TEST

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

- To enter the servo test start the 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.

7. FOCUS TEST

Purpose: Check movement of lens and operation of focus servo in "normal" and "CD-RW compatible" mode.

Since the CD-RW reflects much less light than an ordinary CD-A, the gain of the HF-amplifier stage and the sensitivity of the ADC inside the signal processor "CD10" must be increased. The gain is switched via the HF-GAIN line (pin62 of CD10), the ADC-sensitivity is switched via software (μP → CD10). During start-up the correct mode is chosen automatically; in the service test program it can be switched manually in order to allow individual measurements in both conditions.

- 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".
- The ESP-flag indicates the playback mode.
ESP-flag off means "normal" playback mode (default setting).
ESP-flag on means "CD-RW compatible" playback mode.
- To toggle between playback modes press the "DBB" button.
- 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.

8. 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.

9. 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.

SERVICE TEST PROGRAM – FLOW CHART

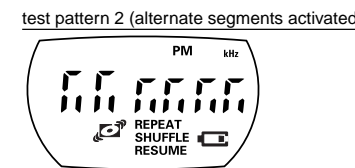
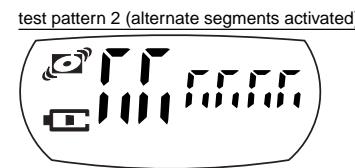
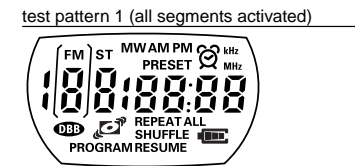
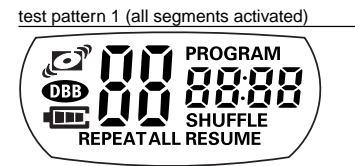
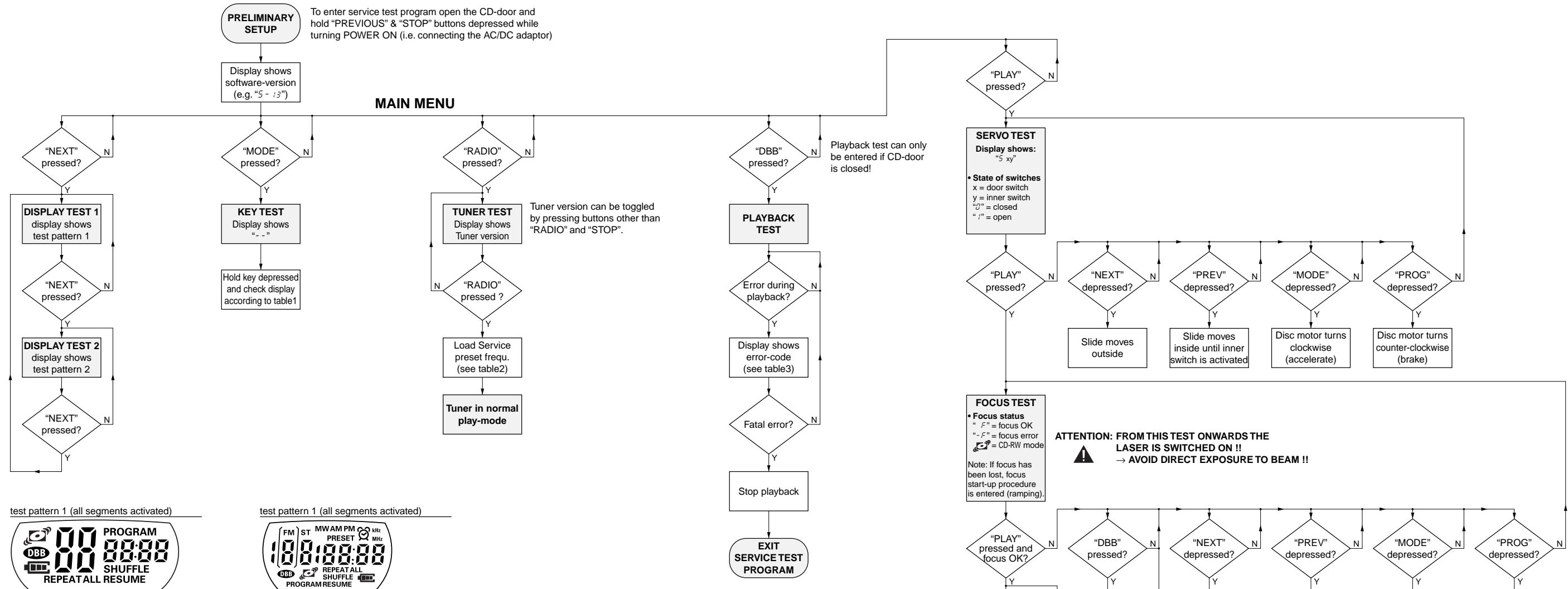


table3 – playback error analysis

CODE	ERROR	TYPE	CAUSE
E 1000	focus error	non fatal	Focus point lost for at least 3ms.
E 1001	radial error	non fatal	The radial servo was offtrack for a certain amount of time.
E 1002	sledge in error	non fatal	The slide did not reach it's inner pos. (inner switch of CD-drive 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 CD-drive 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 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).

table1 – key test

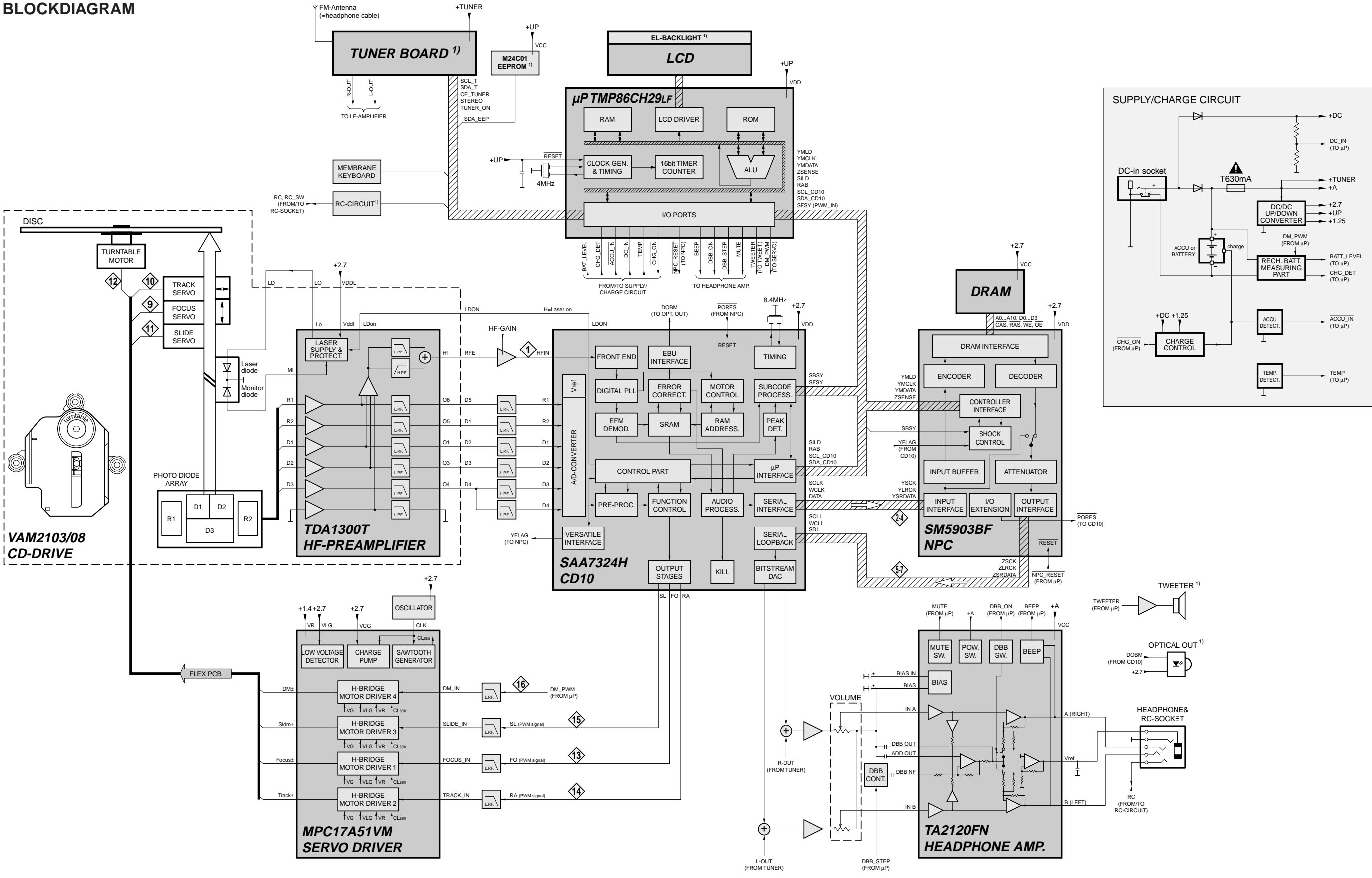
KEYS OF SET	DISPLAY SET
DBB	1
PROGRAM	2
MODE	3
PLAY	5
NEXT	6
PREVIOUS	7
ESP (not for AZ7902)	8
KEYS OF CORD REMOTE CONTROL	
STOP	4 r.c.
PLAY	5 r.c.
NEXT	6 r.c.

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

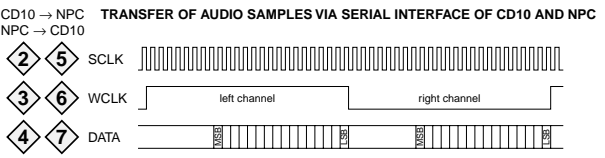
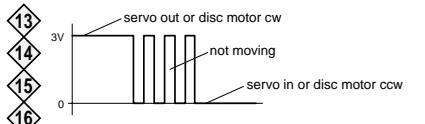
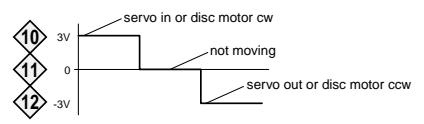
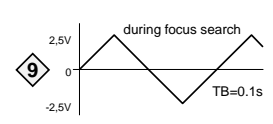
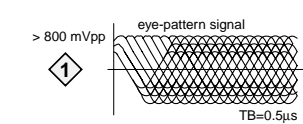
table2 – Tuner service frequencies

BAND	PRESET	FREQUENCY	
		EUROPE	USA
FM 1	1	87.5MHz	87.5MHz
	2	108MHz	108MHz
	3	98MHz	98MHz
	4	-	-
	5	-	-
	6	-	-
AM	1	531kHz	530kHz
	2	1602kHz	1700kHz
	3	558kHz	560kHz
	4	1494kHz	1500kHz
	5	-	-
	6	-	-

BLOCKDIAGRAM

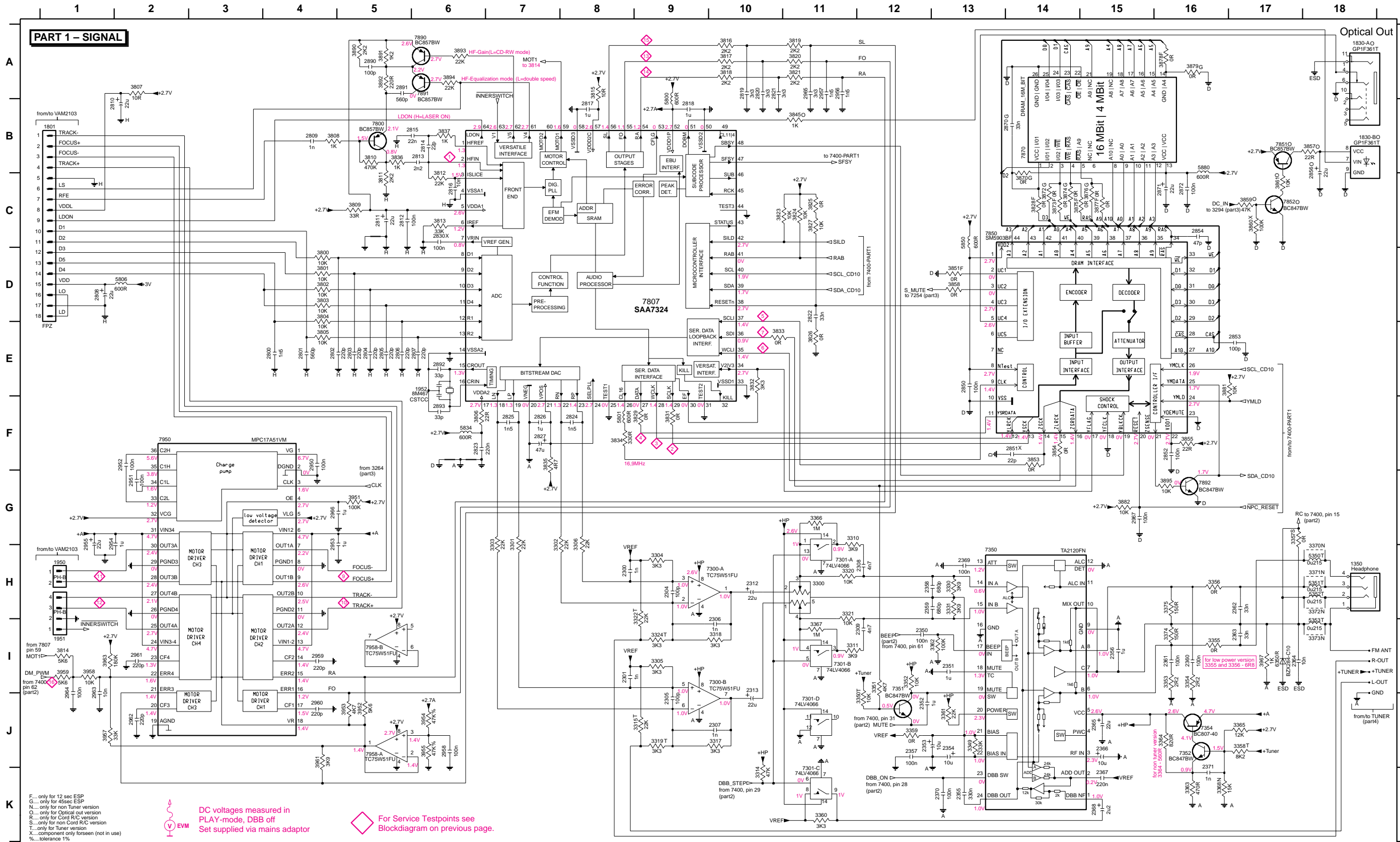


VAM2103/08 CD-DRIVE

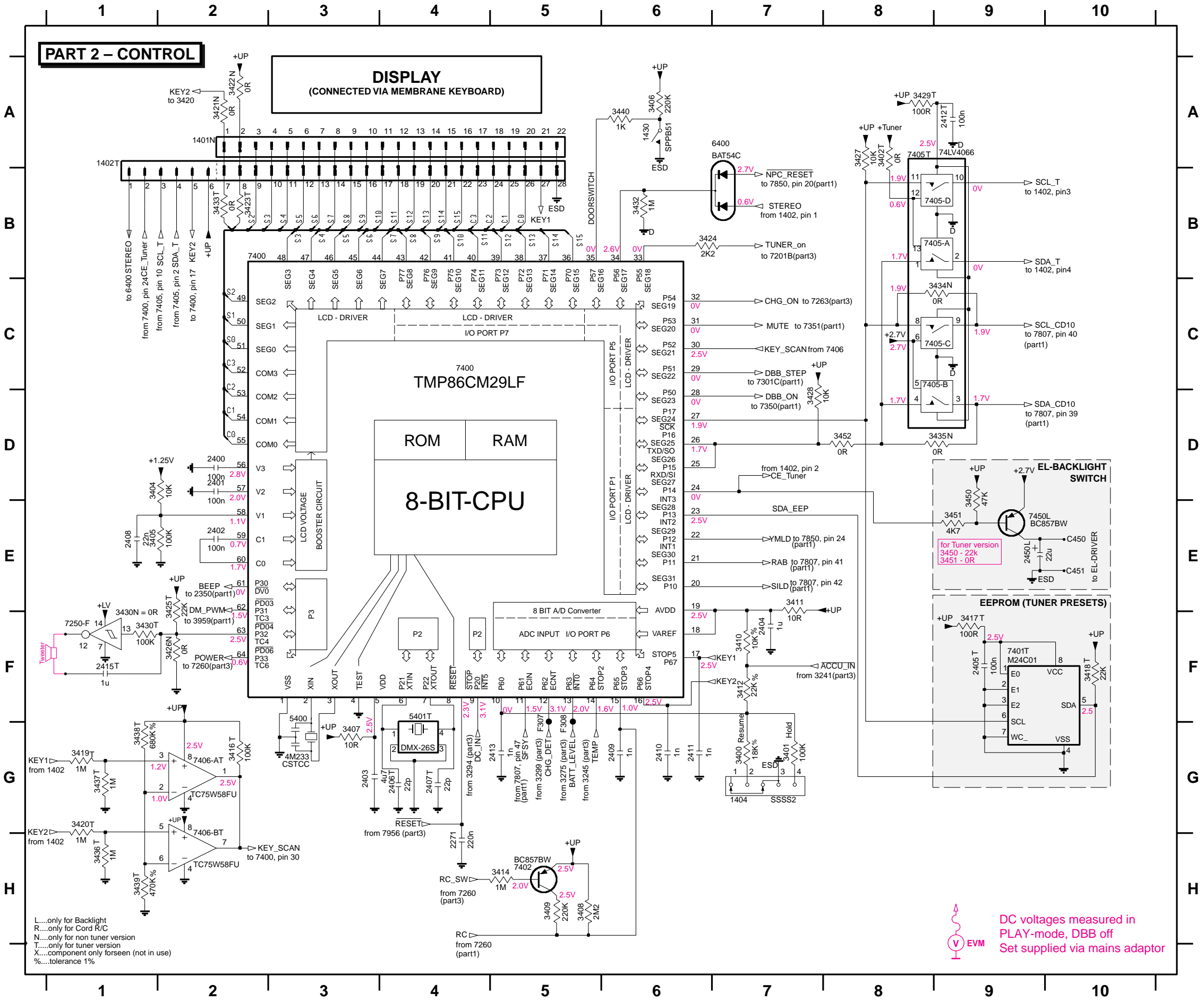


1) not on all versions

1350 H18	2304 H9	2351 I13	2360 I16	2369 H13	2806 E5	2815 B6	2824 F8	2854 C16	2950 F4	2959 I4	3300 H11	3314 K10	3330 H13	3356 H16	3365 J17	3375 H16	3808 B4	3817 A10	3827 C11	3837 B6	3860 C17	3878 A16	3895 G16	3961 J4	5806 D2	7301-C J11	7851 B17
1801 B1	2305 J9	2352 J12	2361 I16	2370 K13	2807 E6	2816 C6	2825 F7	2856 B18	2951 G2	2960 J4	3301 G7	3315 J9	3331 H13	3357 G17	3366 G11	3800 D4	3809 C5	3818 A10	3828 C14	3845 B11	3861 C17	3879 A16	3951 G5	3963 I1	5834 F6	7301-D J11	7852 C17
1800-A A18	2306 I10	2353 J12	2362 H17	2371 K16	2808 D1	2817 A8	2826 F7	2870 B14	2952 G2	2961 J2	3302 H7	3317 J10	3340 I13	3358 J17	3367 I11	3801 D4	3810 B5	3819 A11	3829 F9	3851 D13	3870 C14	3881 E17	3952 J5	3967 H7	5850 C13	7301-E J11	7853 A17
1800-B B18	2307 J10	2354 J13	2363 I17	2800 E4	2809 B4	2818 B9	2827 F7	2871 C16	2953 G4	2962 J2	3303 H7	3318 I10	3350 J12	3359 J12	3368 K16	3802 D4	3811 C5	3820 A11	3831 F9	3852 F14	3872 C14	3882 I5	3953 J5	5350 H18	5880 B16	7301-F J11	7854 B17
1950 H1	2308 H12	2355 K13	2364 I17	2801 E4	2810 A1	2819 A10	2830 C6	2872 C16	2954 G1	2963 I1	3304 H9	3319 J9	3351 I12	3360 K11	3370 H18	3803 D4	3812 C6	3821 A11	3832 E10	3854 F14	3873 C14	3880 A5	3954 J6	5351 H18	6300 H17	7301-G J11	7855 C17
1951 H1	2309 H12	2356 I15	2365 J15	2802 E4	2811 C5	2820 A10	2850 E13	2890 A5	2955 G1	2964 I1	3305 I9	3320 H11	3352 H12	3361 J13	3371 H18	3804 D4	3813 C6	3823 C10	3833 E10	3855 F16	3874 C14	3881 A5	3955 J6	5352 H18	7300-A H9	7301-H J11	7856 C17
1952 E6	2312 H10	2357 J12	2366 J15	2803 E5	2812 C5	2821 A10	2851 F14	2891 A5	2956 A11	2965 A11	3306 G8	3321 H11	3353 I16	3362 I12	3372 H18	3805 E4	3814 I1	3834 F8	3857 B18	3875 C14	3882 A5	3957 J1	5353 I18	7300-B H10	7301-I J11	7857 B14	
2300 H8	2313 I10	2358 H12	2367 K15	2804 E5	2813 B6	2822 D11	2852 F16	2892 E6	2957 A11	2966 G4	3310 G11	3322 H9	3354 I16	3363 K16	3373 I18	3806 F6	3815 A8	3825 C11	3835 F7	3858 D13	3876 C15	3883 A6	3958 I1	5800 A9	7301-A H11	7807 B6	7958-A J5
2301 I8	2350 I12	2359 H12	2368 K15	2805 E5	2814 B6	2823 F6	2853 E17	2893 F6	2958 J6	2967 G15	3311 H11	3324 I9	3355 I16	3364 J16	3374 I16	3807 A2	3816 A10	3826 E11	3836 B5	3859 C17	3877 C15	3884 A6	3959 I1	5801 F8	7301-B H11	7850 C13	7958-B I5

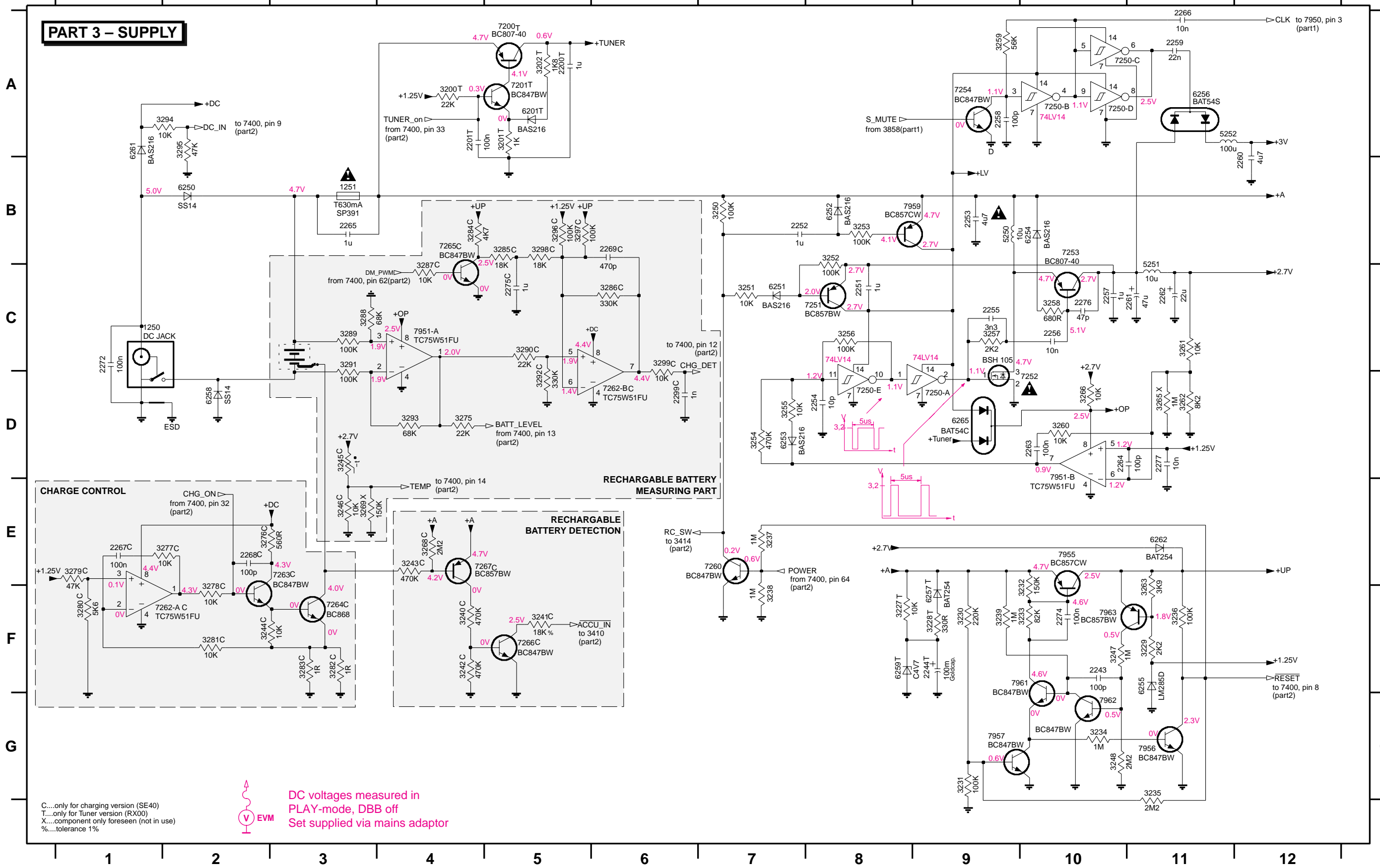


1401 A2	2400 D2	2405 F9	2410 G6	2450 E9	3405 E1	3410 F7	3417 F9	3422 A2	3427 A8	3433 B2	3438 G1	3452 D8	7400 B2	7405-C C8	C450 E10
1402 A1	2401 D2	2406 G4	2411 G6	3400 G7	3406 A6	3411 E7	3418 F10	3423 B2	3428 D7	3434 C9	3439 H1	5400 F3	7401 F9	7405-D B8	C451 E10
1404 G7	2402 E2	2407 G4	2412 A9	3401 G7	3407 G3	3412 F7	3419 G1	3424 B6	3429 A8	3435 D9	3440 A6	5401 F4	7402 G5	7406-A G2	
1430 A6	2403 G3	2408 E1	2413 G5	3402 A8	3408 H5	3414 G5	3420 G1	3425 E2	3430 F1	3436 H1	3450 D9	6400 A6	7405-A B8	7406-B H2	
2271 G4	2404 F7	2409 G6	2415 F1	3404 D1	3409 H5	3416 G2	3421 A2	3426 F2	3432 B6	3437 G1	3451 E9	7250-F F1	7405-B C8	7450 E9	




1250 C1	2252 B7	2259 A11	2266 A11	2276 C10	3228 F9	3235 G11	3242 F4	3250 B7	3257 C9	3265 D11	3278 F2	3285 B5	3292 D5	3299 C6	6252 B8	6259 F8	7250-B A10	7254 A9	7266 F5	7959 B8
1251 B3	2253 B9	2260 B12	2267 E1	2277 D11	3229 F11	3236 F11	3243 E4	3251 C7	3258 C10	3266 D10	3279 E1	3286 C6	3293 D4	5250 B9	6253 D7	6261 A1	7250-C A10	7260 E7	7267 E4	7961 F10
2200 A5	2254 D8	2261 C11	2268 E2	2299 D6	3230 F9	3237 E7	3244 F2	3252 B8	3259 A9	3268 E4	3280 F4	3287 C4	3294 A2	5251 C11	6254 B10	6262 E11	7250-D A10	7262-A F1	7951-A C4	7962 G10
2201 A4	2255 C9	2262 C11	2269 B6	3200 A4	3231 G9	3238 F7	3245 D3	3253 B8	3260 D10	3269 E3	3281 F2	3288 C3	3295 A2	5252 A11	6255 F11	6265 D9	7250-E D8	7262-B D6	7951-B E10	7963 F10
2243 F10	2256 C10	2263 D10	2272 C1	3201 A5	3232 F10	3239 F9	3246 E3	3254 D7	3261 C11	3275 D4	3282 F3	3289 C3	3296 B5	6201 A5	6256 A11	7200 A5	7251 C7	7263 E3	7955 E10	
2244 F9	2257 C10	2264 D10	2274 F10	3202 A5	3233 F10	3240 F4	3247 F10	3255 D7	3262 D11	3276 E2	3283 F3	3290 C5	3297 B5	6250 B2	6257 F9	7201 A5	7252 D10	7264 F3	7956 G11	
2251 C8	2258 A9	2265 B3	2275 C5	3227 F8	3234 G10	3241 F5	3248 G10	3256 C8	3263 F11	3277 E2	3284 B4	3291 C3	3298 B5	6251 C7	6258 D2	7250-A D9	7253 B10	7265 B4	7957 G9	

PART 3 - SUPPLY

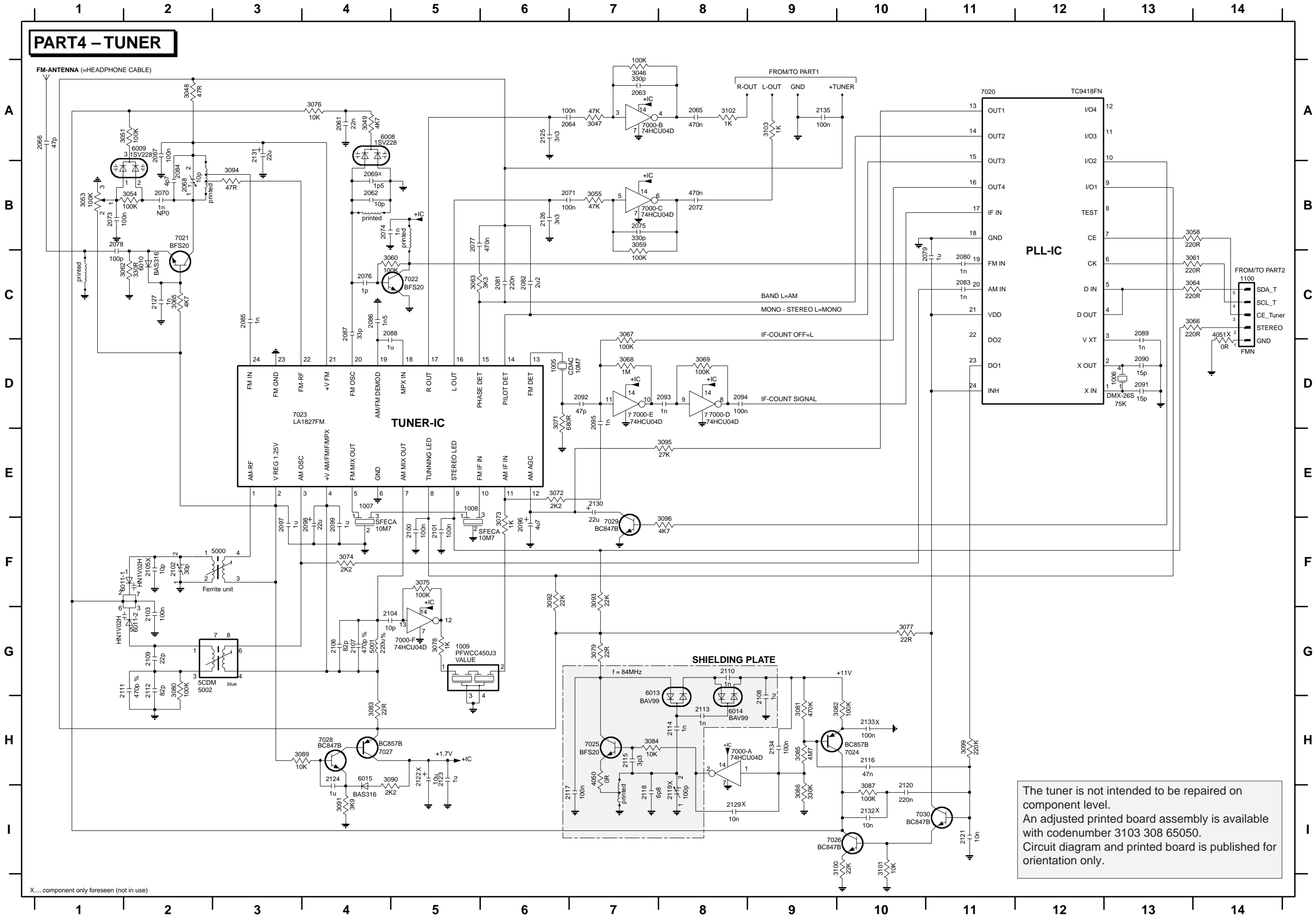


C....only for charging version (SE40)
T....only for Tuner version (RX00)
X....component only foreseen (not in use)
%....tolerance 1%

 DC voltages measured in
PLAY-mode, DBB off
Set supplied via mains adaptor

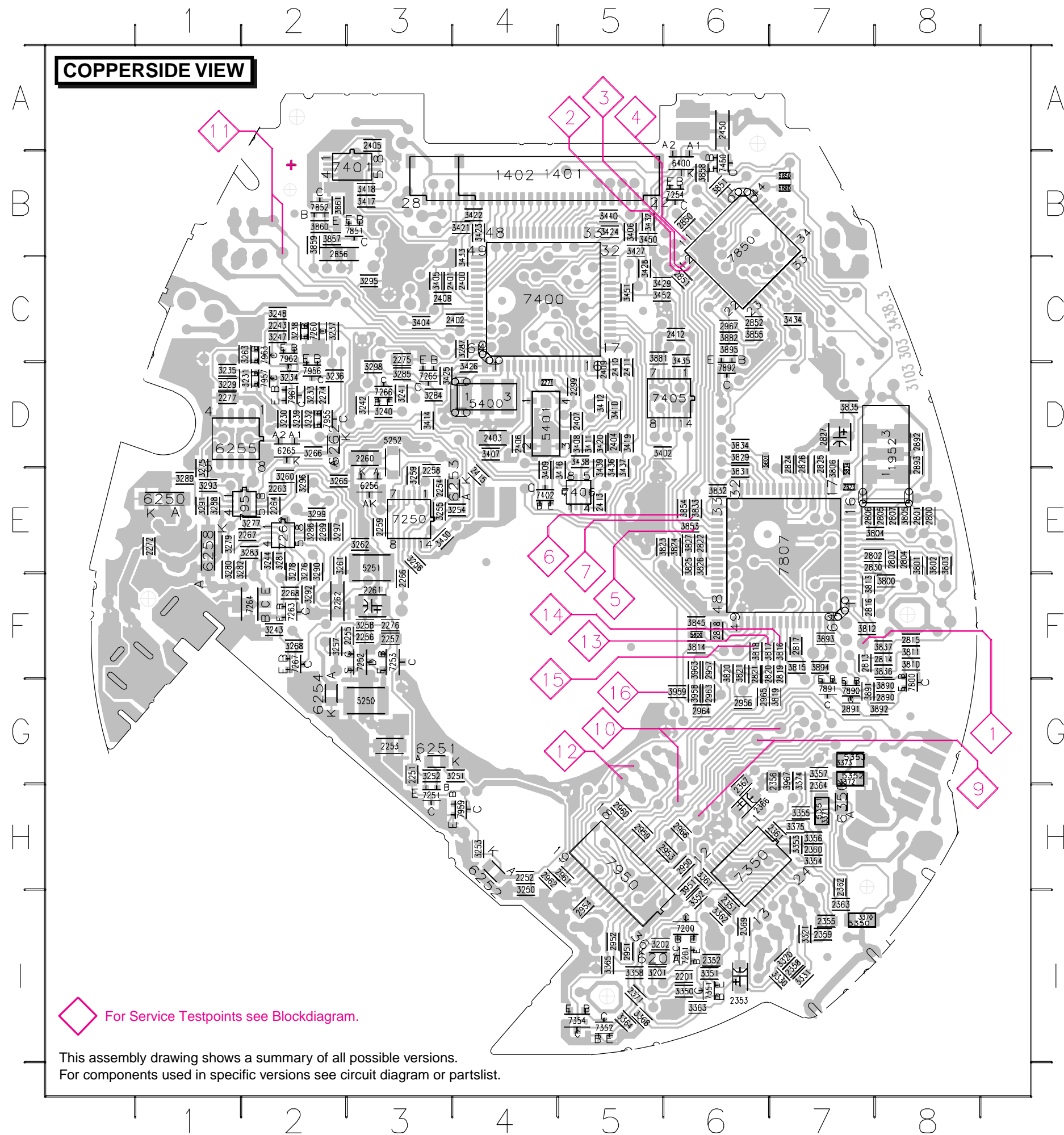
1006 D13	7030 I11	2068 B2	2074 B4	2080 C11	2086 C4	2092 D7	2098 F4	2104 G4	2110 G8	2115 H7	2121 I11	2127 C2	2134 H9	3053 B1	3061 C13	3067 C7	3074 F4	3080 G2	3086 I9	3093 F7	3101 I10	5002 G2	6011-2 G2	7000-C B7	7022 C5	7028 H4
1007 E4	2062 B4	2069 B4	2075 B7	2081 C6	2087 C4	2093 D8	2099 F4	2105 F2	2111 G2	2116 H10	2122 H5	2129 I8	2135 A9	3054 B2	3062 C2	3068 D7	3075 F5	3081 H9	3087 I10	3094 B3	3102 A8	6008 A4	6013 G8	7000-D D8	7023 D3	7029 F7
1008 E5	2063 A7	2070 B2	2076 C4	2082 C6	2088 C4	2094 D8	2100 F5	2106 G4	2112 G2	2117 I7	2123 H5	2130 E7	3046 A7	3055 B7	3063 C5	3069 D8	3076 A4	3082 H10	3089 H3	3095 E8	3103 A9	6009 A2	6014 H8	7000-E D7	7024 H10	7030 I11
1009 G5	2064 A6	2071 B6	2077 B5	2083 C11	2089 C13	2095 D7	2101 F5	2107 G4	2113 H8	2118 I7	2124 H4	2131 A3	3047 A7	3058 B13	3064 C13	3071 D6	3077 G10	3083 H4	3090 H4	3096 F8	4050 H7	5051 A2	6015 H4	7000-F G5	7025 H7	
1100 C14	2065 A8	2072 B8	2078 B1	2084 B2	2090 D13	2096 F6	2102 F2	2108 H9	2114 H8	2119 I8	2125 A6	2132 I0	3048 A2	3059 B7	3065 C2	3072 E6	3078 G5	3084 H7	3091 I4	3099 H11	4051 C14	6010 C2	7000-A H9	7020 A11	7026 I10	
2061 A4	2067 A2	2073 B1	2079 C11	2085 C3	2091 D13	2097 F3	2103 G2	2109 G2	2066 A1	2120 I10	2126 B6	2133 H10	3049 A4	3060 C4	3066 C13	3073 F6	3079 G7	3085 H9	3092 F6	3100 I10	5001 G4	6011-1 F2	7000-B A7	7021 B2	7027 H4	

PART4 - TUNER



X... component only foreseen (not in use)

1401 B5	2415 E4	3237 C2	3355 H7	3806 E7	5834 E7
1402 B4	2450 A6	3238 C2	3356 H7	3810 F8	5850 B7
1952 D8	2800 E8	3239 D2	3357 G7	3811 F8	5880 B7
2201 I6	2801 E8	3240 D3	3358 I5	3812 F7	6201 I5
2243 C2	2802 E7	3241 D3	3361 H6	3813 F7	6250 E1
2251 G3	2803 E8	3242 D3	3362 I6	3814 F6	6251 G3
2252 H4	2804 E8	3243 F2	3363 I6	3815 F7	6252 H4
2253 G3	2805 E8	3244 E2	3364 I5	3816 F7	6253 E4
2254 E3	2806 E7	3247 C2	3365 I5	3817 F6	6254 G2
2255 F3	2807 E8	3248 C2	3368 I5	3818 F6	6255 D1
2256 F3	2813 F7	3250 H4	3370 I7	3819 G7	6256 E3
2257 F3	2814 F8	3251 G4	3371 H7	3820 F6	6258 E1
2258 E3	2815 F8	3252 G3	3372 G7	3821 F6	6262 D2
2259 E3	2816 F7	3253 H4	3373 G7	3823 E5	6265 D2
2260 D3	2817 F7	3254 E4	3374 G7	3824 E6	6350 H7
2261 F3	2818 F6	3255 E3	3375 H7	3825 E6	6400 B6
2262 F2	2819 F7	3256 E3	3402 D5	3826 E6	7200 I6
2263 E2	2820 F6	3257 F2	3404 C3	3827 E6	7201 I6
2264 E2	2821 F6	3258 F3	3405 C3	3829 D6	7250 E3
2266 F3	2822 E6	3259 E3	3406 B5	3831 E6	7251 H3
2267 E2	2823 E7	3260 E2	3407 D4	3832 E6	7252 F3
2268 F2	2824 D7	3261 E2	3408 D5	3833 E6	7253 F3
2269 E2	2825 D7	3262 E3	3409 E4	3834 D6	7254 B6
2271 D4	2826 D7	3263 C2	3410 D5	3835 D7	7260 C2
2272 E1	2827 D7	3265 E2	3411 D5	3836 F8	7262 E2
2274 D2	2830 E7	3266 D2	3412 D5	3837 F8	7263 F2
2275 C3	2850 B6	3268 F2	3414 D3	3845 F6	7264 F2
2276 F3	2851 C6	3275 E1	3416 E5	3851 B6	7265 D3
2277 D1	2852 C6	3276 E2	3417 B3	3853 E6	7266 D3
2299 D5	2856 B2	3277 E2	3418 B3	3854 E6	7267 F2
2351 I6	2890 G8	3278 E2	3419 D5	3855 C6	7350 H6
2352 I6	2891 G7	3279 E1	3420 D5	3857 B2	7351 I6
2353 I6	2892 D8	3280 E1	3421 B4	3858 B6	7352 I5
2355 I7	2893 D8	3281 E2	3422 B4	3859 B2	7354 I5
2356 G7	2950 H6	3282 E1	3423 B4	3860 B2	7400 C4
2358 I7	2951 I5	3283 E2	3424 B5	3861 B2	7401 B3
2359 I7	2952 I5	3284 D3	3425 D3	3881 C5	7402 E4
2360 H7	2953 H6	3285 D3	3426 D4	3882 C6	7405 D6
2361 H7	2954 I5	3286 E2	3427 B5	3890 G8	7406 E5
2362 H7	2956 G6	3287 C4	3428 C5	3891 G7	7450 B6
2363 I7	2957 F6	3288 E1	3429 C5	3892 G8	7800 G8
2364 H7	2959 H5	3289 E1	3430 E3	3893 F7	7807 E7
2366 H6	2960 H5	3290 E2	3432 B5	3894 F7	7850 B6
2367 H6	2961 H5	3291 E1	3433 C4	3895 C6	7851 B3
2369 I6	2962 H4	3292 F2	3434 C7	3951 H6	7852 B2
2371 I5	2963 G6	3293 E1	3435 C6	3958 G6	7890 G7
2400 C4	2964 G6	3295 C3	3436 E5	3959 G6	7891 G7
2401 C3	2965 G6	3296 E2	3437 E5	3963 F6	7892 D6
2402 C4	2966 H6	3297 E2	3438 D5	3967 G7	7950 H5
2403 D4	2967 C6	3298 D3	3439 E5	5250 G3	7951 E2
2404 D5	3201 I5	3299 E2	3440 B5	5251 E3	7955 D2
2405 A3	3202 I5	3320 I7	3450 B5	5252 D3	7956 D2
2406 D4	3229 D1	3321 I7	3451 C5	5350 I7	7957 D2
2407 D5	3230 D2	3330 I7	3452 C5	5351 H7	7959 H4
2408 C3	3231 D2	3331 I7	3800 F8	5352 G7	7961 D2
2409 D5	3232 D2	3350 I6	3801 E8	5353 G7	7962 C2
2410 D5	3233 D2	3351 I6	3802 E8	5400 D4	7963 C2
2411 D5	3234 D2	3352 I6	3803 E8	5401 D4	
2412 C6	3235 D1	3353 H7	3804 E8	5800 F6	
2413 E5	3236 D2	3354 H7	3805 E8	5801 D6	



COMPONENTSIDE VIEW



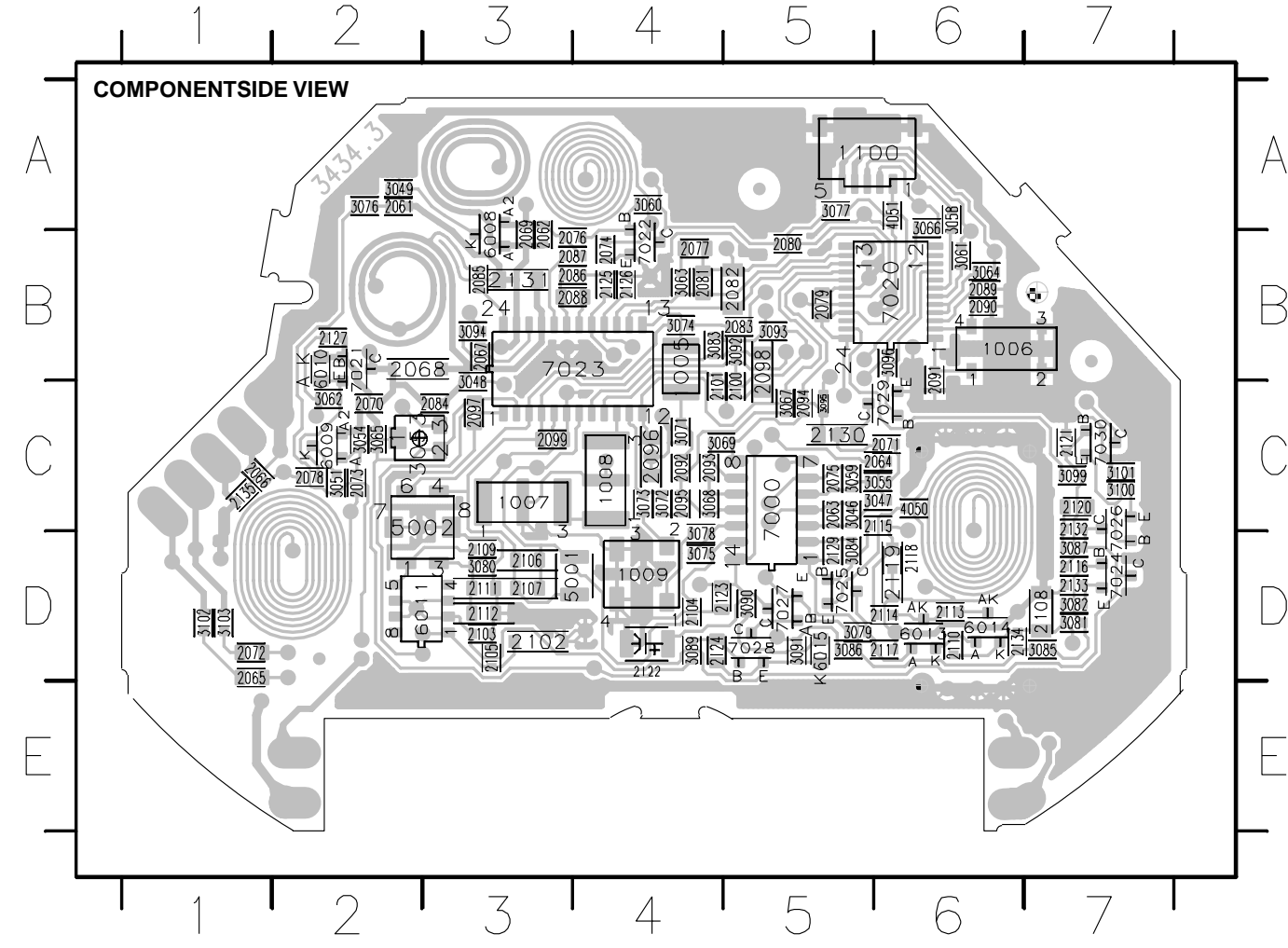
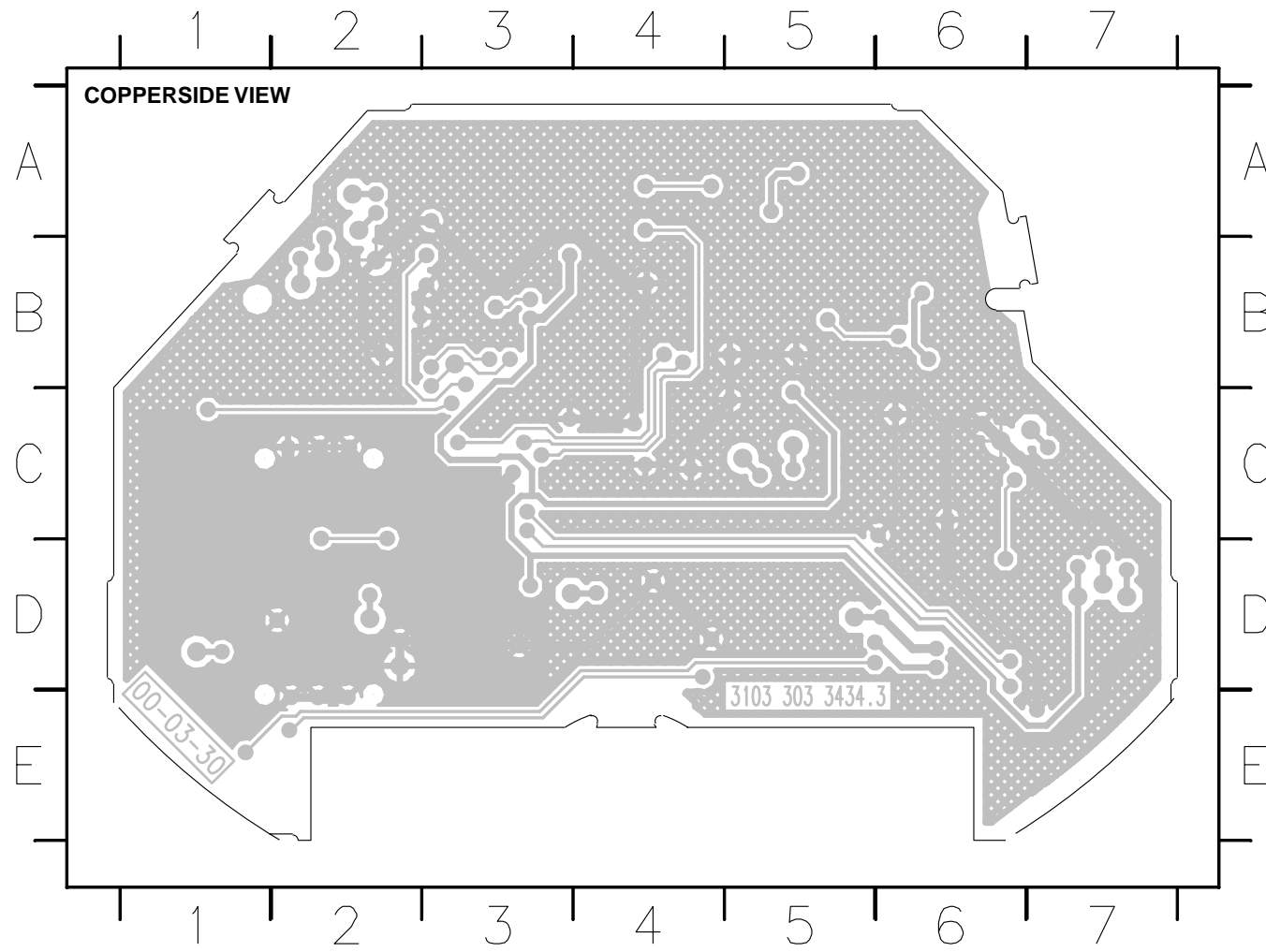
1250 E9	3319 G1
1251 I4	3322 H2
1350 H1	3324 G1
1404 G1	3349 I3
1430 C2	3359 H2
1801 E2	3360 G3
1830 C7	3366 H2
1950 B8	3367 H2
1951 H4	3400 F1
2200 J4	3401 G1
2244 I3	3807 F2
2265 I4	3808 F1
2300 G3	3809 F2
2301 G2	3828 D2
2304 H2	3870 C2
2305 G2	3872 C2
2306 G2	3873 C2
2307 G2	3874 D2
2308 H2	3875 C2
2309 H2	3876 C2
2312 H2	3877 C2
2313 G2	3878 B2
2350 H3	3879 B2
2354 I3	3952 H3
2357 H3	3953 H3
2365 H3	3954 H4
2368 H2	3955 I4
2370 H3	3957 H4
2808 F2	3961 H4
2809 F2	5806 E3
2810 F2	6257 I3
2811 G2	6259 H3
2812 F2	6261 E8
2853 C2	7300 G2
2854 C2	7301 H3
2870 D2	7870 C2
2871 B3	7958 I4
2872 B3	
2955 H3	
2958 I4	
3200 I4	
3227 I3	
3228 I3	
3245 H6	
3246 G6	
3269 G6	
3294 E8	
3300 J2	
3301 F3	
3302 G3	
3303 G2	
3304 G3	
3305 G2	
3306 E3	
3310 H2	
3311 H2	
3314 G1	
3315 G1	
3317 G2	
3318 H2	

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

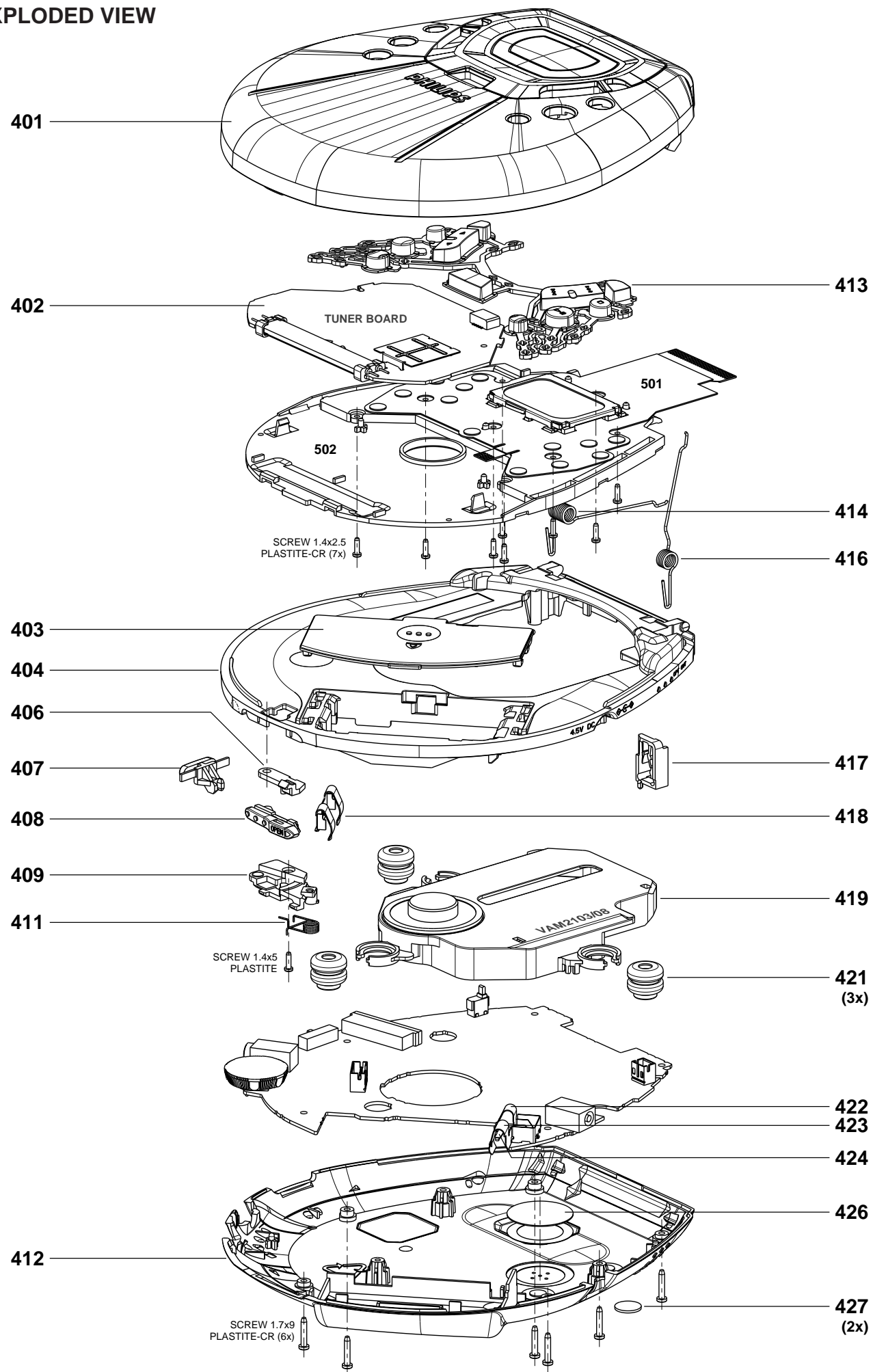
TUNER BOARD

The tuner is not intended to be repaired on component level.
 An adjusted printed board assembly is available with codenumber 3103 308 65050.
 Circuit diagram and printed board is published for orientation only.

1005 B4	2068 B2	2081 B4	2094 C5	2107 D3	2120 C7	2134 D6	3061 B6	3075 D4	3089 D4	4050 C6	7021 B2
1006 B6	2069 B3	2082 B5	2095 C4	2108 D7	2121 C7	2135 C1	3062 C2	3076 A2	3090 D5	4051 A6	7022 B4
1007 C3	2070 C2	2083 B5	2096 C4	2109 D3	2122 D4	3046 C5	3063 B4	3077 A5	3091 D5	5001 D3	7023 B4
1008 C4	2071 C6	2084 C3	2097 C3	2110 D6	2123 D4	3047 C6	3064 B6	3078 D4	3092 B5	5002 C3	7024 D7
1009 D4	2072 D1	2085 B3	2098 B5	2111 D3	2124 D4	3048 C3	3065 C2	3079 D5	3093 B5	6008 B3	7025 D5
1100 A5	2073 C2	2086 B4	2099 C3	2112 D3	2125 B4	3049 A2	3066 A6	3080 D3	3094 B3	6009 C2	7026 C7
2061 A2	2074 B4	2087 B4	2100 C5	2113 D6	2126 B4	3051 C2	3067 C5	3081 D7	3095 C5	6010 B2	7027 D5
2062 B3	2075 C5	2088 B4	2101 C4	2114 D6	2127 B2	3053 C2	3068 C4	3082 D7	3096 B6	6011 D2	7028 D5
2063 C5	2076 B4	2089 B6	2102 D3	2115 C6	2129 D5	3054 C2	3069 C4	3083 B4	3099 C7	6013 D6	7029 C6
2064 C6	2077 B4	2090 B6	2103 D3	2116 D7	2130 C5	3055 C6	3071 C4	3084 D5	3100 C7	6014 D6	7030 C7
2065 D1	2078 C2	2091 B6	2104 D4	2117 D6	2131 B3	3058 A6	3072 C4	3085 D7	3101 C7	6015 D5	
2066 C1	2079 B5	2092 C4	2105 D3	2118 D6	2132 C7	3059 C5	3073 C4	3086 D5	3102 D1	7000 C5	
2067 B3	2080 B5	2093 C4	2106 D3	2119 D6	2133 D7	3060 A4	3074 B4	3087 D7	3103 D1	7020 B6	



EXPLODED VIEW



MECHANICAL PARTSLIST

401	8240 009 25920	DOOR-CD-2J12-LAC-PRI ASSEMBLY for AZ9015
401	8240 009 26010	DOOR-CD-2M45-PRI ASSEMBLY for AZ9225
401	8240 009 25950	DOOR-CD-2T-LAC-PRI ASSEMBLY for AZT9230
402	3103 308 65050	TUNER BOARD ASSEMBLY
403	3103 304 68080	DOOR-BATTERY-2 for AZ9015
403	3103 307 97920	DOOR-BATTERY-2-LAC for AZ9225
403	3103 307 98990	DOOR-BATTERY-2T-LAC for AZT9230
404	3103 304 68390	CABINET-2-O for AZ9015
404	3103 307 99040	CABINET-2-O-LAC for AZ9225
404	3103 307 98980	CABINET-2T-LAC for AZT9230
406	3103 304 68060	LEVER-OPEN-2
407	3103 304 68110	SLIDER-RESUME-2
408	3103 307 97940	SLIDER-OPEN-2-LAC
409	3103 304 68070	HOLDER-OPEN-2
411	3103 301 06500	SPRING-SLIDER-OPEN-2
412	3103 307 99050	BOTTOM-2-O-PRI for AZ9015, AZ9225
412	3103 307 99000	BOTTOM-2T-PRI for AZT9230
413	3103 307 98040	BUTTON-SET-ALL-2J45-LAC-PRI for AZ9015, AZ9225
413	3103 307 98310	BUTTON-SET-ALL-2T-PRI for AZT9230
414	3103 301 06520	SPRING-OPEN-LONG-L-2C45 for AZ9015, AZ9225
414	3103 301 06540	SPRING-OPEN-LONG-L-2T for AZT9230
416	3103 301 06510	SPRING-OPEN-LONG-R-2C45 for AZ9015, AZ9225
416	3103 301 06530	SPRING-OPEN-LONG-R-2T for AZT9230
417	3103 304 68090	BRAKE-2
418	3103 301 45180	SPRING-BATTERY-SHORT-2
419	9305 022 13208	CD-DRIVE VAM2103/08
421	4822 402 10897	DAMPER-CD DRIVE
422	3103 301 45200	SPRING-BATTERY-MINUS-2
423	3103 301 45190	SPRING-BATTERY-PLUS-2
424	3103 301 45210	SPRING-BATTERY-CHARGE-2
426	3103 308 53240	BUZZER PIEZO 7BB-20-3 WIRE
427	4822 462 41819	RUBBER FOOT
	4822 502 13872	SCREW 1.4x5 PLASTITE
	3103 300 41570	SCREW 1.4x2.5 PLASTITE-CR
	3103 300 41580	SCREW 1.7x9 PLASTITE-CR

ELECTRICAL PARTSLIST

MISCELLANEOUS

1250	2422 026 05086	EXT. DC-JACK
1251	2422 086 10946	FUSE T630mA 65V ▲
1350	4822 265 11247	SOCKET, HEADPHONE HSJ1537
1350	4822 265 11565	SOCKET, HEADPHONE/RC HSJ1637
1401	2422 025 16767	CONNECTOR, FLEX-FOIL 22P
1402	2422 025 16853	CONNECTOR, FLEX-FOIL 28P
1404	4822 277 21705	SWITCH, SLIDE (HOLD/RESUME)
1430	4822 276 12889	SWITCH (CD-DOOR)
1801	4822 265 11576	CONNECTOR, FLEX-FOIL 18P
1830	4822 265 20669	SOCKET, LINE/OPT.OUT GP1F361T

CAPACITORS

2200◎	4822 126 14472	1μF	10%	10V
2201◎	4822 126 14305	100nF	10%	16V
2243◎	4822 122 31765	100pF	5%	50V
2244◎	2020 025 90023	100mF	20%	5,5V
2251◎	4822 126 14472	1μF	10%	10V
2252◎	3198 017 41050	1μF	20%	10V
2253◎	4822 126 14083	4,7μF	20%	10V
2254◎	4822 122 33741	10pF	10%	50V
2255◎	5322 126 11579	3,3nF	10%	63V
2256◎	5322 126 11583	10nF	10%	63V
2257◎	4822 126 14472	1μF	10%	10V
2258◎	4822 122 31765	100pF	5%	50V
2259◎	4822 126 14494	22nF	10%	25V
2260◎	3198 032 54110	4,7μF	20%	20V
2261◎	2022 009 00656	47μF	20%	6,3V
2262◎	3198 032 24150	22μF	20%	6,3V
2263◎	4822 126 14305	100nF	10%	16V
2264◎	4822 122 31765	100pF	5%	50V
2265◎	4822 126 14472	1μF	10%	10V
2266◎	5322 126 11583	10nF	10%	63V
2267◎	4822 126 14305	100nF	10%	16V
2268◎	4822 122 31765	100pF	5%	50V
2269◎	4822 126 13881	470pF	5%	50V
2271◎	4822 126 13879	220nF	20%	16V
2272◎	4822 126 14305	100nF	10%	16V
2274◎	4822 126 14305	100nF	10%	16V
2275◎	4822 126 14472	1μF	10%	10V
2276◎	4822 122 33777	47pF	5%	63V
2277◎	5322 126 11583	10nF	10%	63V
2299◎	5322 126 11578	1nF	10%	63V
2300◎	5322 126 11578	1nF	10%	63V
2301◎	5322 126 11578	1nF	10%	63V
2304◎	4822 122 31765	100pF	5%	50V
2305◎	4822 122 31765	100pF	5%	50V
2306◎	5322 126 11578	1nF	10%	63V
2307◎	5322 126 11578	1nF	10%	63V
2308◎	4822 126 13193	4,7nF	10%	63V
2309◎	4822 126 13193	4,7nF	10%	63V
2312◎	3198 032 24150	22μF	20%	6,3V
2313◎	3198 032 24150	22μF	20%	6,3V
2350◎	4822 126 14305	100nF	10%	16V
2351◎	4822 126 14043	1μF	20%	16V
2352◎	4822 126 14043	1μF	20%	16V
2353◎	2020 004 90283	10μF	20%	10V
2354◎	2020 004 90283	10μF	20%	10V
2355◎	4822 126 12102	330nF	20%	50V
2356◎	4822 126 14043	1μF	20%	16V
2357◎	4822 126 14305	100nF	10%	16V
2358◎	4822 126 13909	680pF	10%	50V
2359◎	4822 126 13909	680pF	10%	50V

CAPACITORS

2360◎	4822 126 14305	100nF	10%	16V
2361◎	4822 126 14305	100nF	10%	16V
2362◎	4822 126 14549	33nF	10%	16V
2363◎	4822 126 14549	33nF	10%	16V
2364◎	5322 126 11583	10nF	10%	63V
2365◎	3198 032 24150	22μF	20%	6,3V
2366◎	2020 004 90283	10μF	20%	10V
2367◎	2238 780 15654	220nF	10%	16V
2368◎	3198 032 64090	2,2μF	20%	25V
2369◎	4822 126 14305	100nF	10%	16V
2370◎	4822 126 14305	100nF	10%	16V
2371◎	5322 126 11578	1nF	10%	63V
2400◎	4822 126 14305	100nF	10%	16V
2401◎	4822 126 14305	100nF	10%	16V
2402◎	4822 126 14305	100nF	10%	16V
2403◎	3198 032 54110	4,7μF	20%	20V
2404◎	4822 126 14472	1μF	10%	10V
2405◎	4822 126 14305	100nF	10%	16V
2406◎	4822 122 33761	22pF	5%	50V
2407◎	4822 122 33761	22pF	5%	50V
2408◎	4822 126 14494	22nF	10%	25V
2409◎	5322 126 11578	1nF	10%	63V
2410◎	5322 126 11578	1nF	10%	63V
2411◎	5322 126 11578	1nF	10%	63V
2412◎	4822 126 14305	100nF	10%	16V
2413◎	5322 126 11578	1nF	10%	63V
2415◎	3198 017 41051	1μF	10%	10V
2450◎	3198 032 24150	22μF	20%	6,3V
2800◎	4822 126 14247	1,5nF	10%	50V
2801◎	4822 126 14249	560pF	10%	50V
2802◎	4822 126 13883	220pF	5%	50V
2803◎	4822 126 13883	220pF	5%	50V
2804◎	4822 126 13883	220pF	5%	50V
2805◎	4822 126 13883	220pF	5%	50V
2806◎	4822 126 13883	220pF	5%	50V
2807◎	4822 126 13883	220pF	5%	50V
2808◎	3198 032 24150	22μF	20%	6,3V
2809◎	5322 126 11578	1nF	10%	63V
2810◎	3198 032 24150	22μF	20%	6,3V
2811◎	3198 032 24150	22μF	20%	6,3V
2812◎	4822 126 14305	100nF	10%	16V
2813◎	4822 126 14238	2,2nF	10%	50V
2814◎	4822 122 33761	22pF	5%	50V
2815◎	4822 126 14494	22nF	10%	25V
2816◎	5322 126 11583	10nF	10%	63V
2817◎	4822 126 14043	1μF	20%	16V
2818◎	4822 126 14043	1μF	20%	16V
2819◎	5322 126 11579	3,3nF	10%	63V
2820◎	5322 126 11579	3,3nF	10%	63V
2821◎	5322 126 11579	3,3nF	10%	63V
2822◎	4822 126 14549	33nF	10%	16V
2823◎	4822 126 13879	220nF	20%	16V
2824◎	4822 126 14247	1,5nF	10%	50V
2825◎	4822 126 14247	1,5nF	10%	50V
2826◎	3198 017 41050	1μF	20%	10V
2827◎	2022 009 00656	47μF	20%	6,3V
2850◎	4822 126 14305	100nF	10%	16V
2852◎	4822 126 14305	100nF	10%	16V
2853◎	4822 122 31765	100pF	5%	50V
2854◎	4822 122 33777	47pF	5%	63V
2856◎	3198 032 24150	22μF	20%	6,3V
2870◎	4822 126 14549	33nF	10%	16V
2871◎	3198 032 24150	22μF	20%	6,3V
2872◎	4822 126 14305	100nF	10%	16V

CAPACITORS

2890	©	4822 122 31765	100pF	5%	50V
2891	©	4822 126 14249	560pF	10%	50V
2892	©	3198 016 33391	33pF	10%	50V
2893	©	3198 016 33391	33pF	10%	50V
2950	©	4822 126 14305	100nF	10%	16V
2951	©	4822 126 14305	100nF	10%	16V
2952	©	4822 126 14305	100nF	10%	16V
2953	©	4822 126 14472	1µF	10%	10V
2954	©	4822 126 14472	1µF	10%	10V
2955	©	4822 124 12145	22µF	20%	6,3V
2956	©	4822 126 14247	1,5nF	10%	50V
2957	©	4822 126 14247	1,5nF	10%	50V
2958	©	4822 126 14305	100nF	10%	16V
2959	©	4822 126 13883	220pF	5%	50V
2960	©	4822 126 13883	220pF	5%	50V
2961	©	4822 126 13883	220pF	5%	50V
2962	©	4822 126 13883	220pF	5%	50V
2963	©	5322 126 11583	10nF	10%	63V
2964	©	4822 126 14305	100nF	10%	16V
2965	©	5322 126 11579	3,3nF	10%	63V
2966	©	4822 126 14472	1µF	10%	10V
2967	©	4822 126 14305	100nF	10%	16V

RESISTORS

3200	©	4822 051 30223	22kΩ	5%	0,06W
3201	©	4822 051 30102	1kΩ	5%	0,06W
3202	©	4822 117 12903	1,8kΩ	1%	0,06W
3227	©	4822 051 30103	10kΩ	5%	0,06W
3228	©	4822 051 30331	330Ω	5%	0,06W
3229	©	4822 051 30222	2,2kΩ	5%	0,06W
3230	©	4822 117 12891	220kΩ	1%	0,06W
3231	©	4822 117 13632	100kΩ	1%	0,06W
3232	©	4822 051 30154	150kΩ	5%	0,06W
3233	©	4822 117 12864	82kΩ	5%	0,6W
3234	©	4822 051 30105	1MΩ	5%	0,06W
3235	©	3198 021 32250	2,2MΩ	5%	0,06W
3236	©	4822 117 13632	100kΩ	1%	0,06W
3237	©	4822 051 30105	1MΩ	5%	0,06W
3238	©	4822 051 30105	1MΩ	5%	0,06W
3239	©	4822 051 30105	1MΩ	5%	0,06W
3240	©	4822 051 30474	470kΩ	5%	0,06W
3241	©	2120 108 93943	18kΩ	1%	0,06W
3242	©	4822 051 30474	470kΩ	5%	0,06W
3243	©	4822 051 30474	470kΩ	5%	0,06W
3244	©	4822 051 30103	10kΩ	5%	0,06W
3245	©	4822 116 30467	10kΩ	5%	NTC
3246	©	4822 051 30103	10kΩ	5%	0,06W
3247	©	4822 051 30105	1MΩ	5%	0,06W
3248	©	3198 021 32250	2,2MΩ	5%	0,06W
3250	©	4822 117 13632	100kΩ	1%	0,06W
3251	©	4822 051 30103	10kΩ	5%	0,06W
3252	©	4822 117 13632	100kΩ	1%	0,06W
3253	©	4822 117 13632	100kΩ	1%	0,06W
3254	©	4822 051 30474	470kΩ	5%	0,06W
3255	©	4822 051 30103	10kΩ	5%	0,06W
3256	©	4822 117 13632	100kΩ	1%	0,06W
3257	©	4822 051 30222	2,2kΩ	5%	0,06W
3258	©	4822 051 30681	680Ω	5%	0,06W
3259	©	4822 051 30563	56kΩ	5%	0,06W
3260	©	4822 051 30103	10kΩ	5%	0,06W
3261	©	4822 051 30103	10kΩ	5%	0,06W
3262	©	4822 117 12902	8,2kΩ	1%	0,06W
3263	©	4822 051 30392	3,9kΩ	5%	0,06W
3266	©	4822 051 30103	10kΩ	5%	0,06W

RESISTORS

3268	©	3198 021 32250	2,2MΩ	5%	0,06W
3275	©	4822 051 30223	22kΩ	5%	0,06W
3276	©	4822 051 30561	560Ω	5%	0,06W
3277	©	4822 051 30103	10kΩ	5%	0,06W
3278	©	4822 051 30103	10kΩ	5%	0,06W
3279	©	4822 117 12925	47kΩ	1%	0,06W
3280	©	4822 051 30562	5,6kΩ	5%	0,06W
3281	©	4822 051 30103	10kΩ	5%	0,06W
3282	©	4822 117 12917	1Ω	5%	0,06W
3283	©	4822 117 12917	1Ω	5%	0,06W
3284	©	4822 051 30472	4,7kΩ	5%	0,06W
3285	©	4822 051 30183	18kΩ	5%	0,06W
3286	©	4822 051 30334	330kΩ	5%	0,06W
3287	©	4822 051 30103	10kΩ	5%	0,06W
3288	©	4822 051 30683	68kΩ	5%	0,06W
3289	©	4822 117 13632	100kΩ	1%	0,06W
3290	©	4822 051 30223	22kΩ	5%	0,06W
3291	©	4822 117 13632	100kΩ	1%	0,06W
3292	©	4822 051 30334	330kΩ	5%	0,06W
3293	©	4822 051 30683	68kΩ	5%	0,06W
3294	©	4822 051 30103	10kΩ	5%	0,06W
3295	©	4822 117 12925	47kΩ	1%	0,06W
3296	©	4822 117 13632	100kΩ	1%	0,06W
3297	©	4822 117 13632	100kΩ	1%	0,06W
3298	©	4822 051 30183	18kΩ	5%	0,06W
3299	©	4822 051 30103	10kΩ	5%	0,06W
3300	©	3103 308 52850	POTMETER ALPS 2x10kΩ CX2		
3301	©	4822 051 30223	22kΩ	5%	0,06W
3302	©	4822 051 30223	22kΩ	5%	0,06W
3303	©	4822 051 30223	22kΩ	5%	0,06W
3304	©	4822 051 30332	3,3kΩ	5%	0,06W
3305	©	4822 051 30332	3,3kΩ	5%	0,06W
3306	©	4822 051 30223	22kΩ	5%	0,06W
3310	©	4822 051 30392	3,9kΩ	5%	0,06W
3311	©	4822 051 30392	3,9kΩ	5%	0,06W
3314	©	4822 117 12925	47kΩ	1%	0,06W
3315	©	4822 051 30223	22kΩ	5%	0,06W
3317	©	4822 051 30332	3,3kΩ	5%	0,06W
3318	©	4822 051 30332	3,3kΩ	5%	0,06W
3319	©	4822 051 30332	3,3kΩ	5%	0,06W
3320	©	4822 051 30103	10kΩ	5%	0,06W
3321	©	4822 051 30103	10kΩ	5%	0,06W
3322	©	4822 051 30223	22kΩ	5%	0,06W
3324	©	4822 051 30332	3,3kΩ	5%	0,06W
3330	©	4822 051 30392	3,9kΩ	5%	0,06W
3331	©	4822 051 30392	3,9kΩ	5%	0,06W
3349	©	4822 051 30333	33kΩ	5%	0,06W
3350	©	4822 051 30103	10kΩ	5%	0,06W
3351	©	4822 051 30472	4,7kΩ	5%	0,06W
3352	©	4822 051 30103	10kΩ	5%	0,06W
3353	©	4822 117 13613	2,2Ω	5%	0,06W
3354	©	4822 117 13613	2,2Ω	5%	0,06W
3355	©	3198 021 36880	6,8Ω	5%	0,06W
3355	©	4822 051 30008	CHIP JUMPER 0603		not for /17
3356	©	3198 021 36880	6,8Ω	5%	0,06W
3356	©	4822 051 30008	CHIP JUMPER 0603		only for /17
3357	©	4822 051 30008	CHIP JUMPER 0603		
3358	©	4822 117 12902	8,2kΩ	1%	0,06W
3359	©	4822 051 30008	CHIP JUMPER 0603		
3360	©	4822 051 30332	3,3kΩ	5%	0,06W
3361	©	4822 051 30223	22kΩ	5%	0,06W
3362	©	4822 117 13632	100kΩ	1%	0,06W
3363	©	4822 051 30471	470Ω	5%	0,06W
3364	©	4822 051 30561	560Ω	5%	0,06W

not for tuner vers.

RESISTORS

3364	© 4822 117 12968	820Ω	5%	0,06W	only for tuner vers.
3365	© 4822 051 30123	12kΩ	5%	0,06W	
3366	© 4822 051 30105	1MΩ	5%	0,06W	
3367	© 4822 051 30105	1MΩ	5%	0,06W	
3368	© 4822 051 30153	15kΩ	5%	0,06W	
3370	© 4822 051 20008	CHIP JUMPER 0805			
3371	© 4822 051 20008	CHIP JUMPER 0805			
3372	© 4822 051 20008	CHIP JUMPER 0805			
3373	© 4822 051 20008	CHIP JUMPER 0805			
3374	© 3198 021 31511	150Ω	5%	0,06W	
3375	© 3198 021 31511	150Ω	5%	0,06W	
3400	© 2120 108 93943	18kΩ	1%	0,06W	
3401	© 4822 117 13632	100kΩ	1%	0,06W	
3402	© 4822 051 30008	CHIP JUMPER 0603			
3404	© 4822 051 30103	10kΩ	5%	0,06W	
3405	© 4822 117 13632	100kΩ	1%	0,06W	
3406	© 4822 117 12891	220kΩ	1%	0,06W	
3407	© 4822 051 30109	10Ω	5%	0,06W	
3408	© 3198 021 32250	2,2MΩ	5%	0,06W	
3409	© 4822 117 12891	220kΩ	1%	0,06W	
3410	© 2120 108 93942	10kΩ	1%	0,06W	
3411	© 4822 051 30109	10Ω	5%	0,06W	
3412	© 2120 108 93944	22kΩ	1%	0,06W	
3414	© 4822 051 30105	1MΩ	5%	0,06W	
3416	© 4822 117 13632	100kΩ	1%	0,06W	
3417	© 4822 051 30101	100Ω	5%	0,06W	
3418	© 4822 051 30223	22kΩ	5%	0,06W	
3419	© 4822 051 30105	1MΩ	5%	0,06W	
3420	© 4822 051 30105	1MΩ	5%	0,06W	
3421	© 4822 051 30008	CHIP JUMPER 0603			
3422	© 4822 051 30008	CHIP JUMPER 0603			
3423	© 4822 051 30008	CHIP JUMPER 0603			
3424	© 4822 051 30222	2,2kΩ	5%	0,06W	
3425	© 4822 051 30223	22kΩ	5%	0,06W	
3426	© 4822 051 30008	CHIP JUMPER 0603			
3427	© 4822 051 30103	10kΩ	5%	0,06W	
3428	© 4822 051 30103	10kΩ	5%	0,06W	
3429	© 4822 051 30101	100Ω	5%	0,06W	
3430	© 4822 117 13632	100kΩ	1%	0,06W	
3432	© 4822 051 30105	1MΩ	5%	0,06W	
3433	© 4822 051 30008	CHIP JUMPER 0603			
3434	© 4822 051 30008	CHIP JUMPER 0603			
3435	© 4822 051 30008	CHIP JUMPER 0603			
3436	© 4822 051 30105	1MΩ	5%	0,06W	
3437	© 4822 051 30105	1MΩ	5%	0,06W	
3438	© 2120 108 93053	680kΩ	1%	0,06W	
3439	© 5322 117 13044	470kΩ	1%	0,06W	
3440	© 4822 051 30102	1kΩ	5%	0,06W	
3450	© 4822 051 30223	22kΩ	5%	0,06W	only for tuner vers.
3450	© 4822 117 12925	47kΩ	1%	0,06W	not for tuner vers.
3451	© 4822 051 30008	CHIP JUMPER 0603 only for tuner vers.			
3451	© 4822 051 30472	4,7kΩ	5%	0,06W	not for tuner vers.
3452	© 4822 051 30008	CHIP JUMPER 0603			
3800	© 4822 051 30103	10kΩ	5%	0,06W	
3801	© 4822 051 30103	10kΩ	5%	0,06W	
3802	© 4822 051 30103	10kΩ	5%	0,06W	
3803	© 4822 051 30103	10kΩ	5%	0,06W	
3804	© 4822 051 30103	10kΩ	5%	0,06W	
3805	© 4822 051 30103	10kΩ	5%	0,06W	
3806	© 4822 117 12139	22Ω	5%	0,06W	
3807	© 4822 051 30109	10Ω	5%	0,06W	
3808	© 4822 051 30102	1kΩ	5%	0,06W	
3809	© 4822 051 30339	33Ω	5%	0,06W	
3810	© 4822 051 30474	470kΩ	5%	0,06W	

RESISTORS

3811	© 4822 051 30222	2,2kΩ	5%	0,06W	
3812	© 4822 051 30223	22kΩ	5%	0,06W	
3813	© 4822 051 30333	33kΩ	5%	0,06W	
3814	© 4822 051 30562	5,6kΩ	5%	0,06W	
3815	© 4822 051 30109	10Ω	5%	0,06W	
3816	© 4822 051 30222	2,2kΩ	5%	0,06W	
3817	© 4822 051 30222	2,2kΩ	5%	0,06W	
3818	© 4822 051 30222	2,2kΩ	5%	0,06W	
3819	© 4822 051 30222	2,2kΩ	5%	0,06W	
3820	© 4822 051 30222	2,2kΩ	5%	0,06W	
3821	© 4822 051 30222	2,2kΩ	5%	0,06W	
3823	© 4822 051 30103	10kΩ	5%	0,06W	
3824	© 4822 051 30103	10kΩ	5%	0,06W	
3825	© 4822 051 30008	CHIP JUMPER 0603			
3826	© 4822 051 30008	CHIP JUMPER 0603			
3827	© 4822 051 30103	10kΩ	5%	0,06W	
3828	© 4822 051 30008	CHIP JUMPER 0603			
3829	© 4822 051 30008	CHIP JUMPER 0603			
3831	© 4822 051 30008	CHIP JUMPER 0603			
3832	© 4822 051 30332	3,3kΩ	5%	0,06W	
3833	© 4822 051 30008	CHIP JUMPER 0603			
3834	© 4822 051 30331	330Ω	5%	0,06W	
3835	© 4822 117 13608	4,7Ω	5%	0,06W	
3836	© 4822 051 30102	1kΩ	5%	0,06W	
3837	© 4822 051 30102	1kΩ	5%	0,06W	
3845	© 4822 051 30102	1kΩ	5%	0,06W	
3851	© 4822 051 30008	CHIP JUMPER 0603			
3853	© 4822 051 30008	CHIP JUMPER 0603			
3854	© 4822 051 30008	CHIP JUMPER 0603			
3855	© 4822 117 12139	22Ω	5%	0,06W	
3857	© 4822 117 12139	22Ω	5%	0,06W	
3858	© 4822 051 30008	CHIP JUMPER 0603			
3859	© 4822 117 12925	47kΩ	1%	0,06W	
3860	© 4822 117 13632	100kΩ	1%	0,06W	
3861	© 4822 051 30103	10kΩ	5%	0,06W	
3870	© 4822 051 30008	CHIP JUMPER 0603			
3872	© 4822 051 30008	CHIP JUMPER 0603			
3873	© 4822 051 30008	CHIP JUMPER 0603			
3874	© 4822 051 30008	CHIP JUMPER 0603			
3875	© 4822 051 30008	CHIP JUMPER 0603			
3876	© 4822 051 30008	CHIP JUMPER 0603			
3877	© 4822 051 30008	CHIP JUMPER 0603			
3878	© 4822 051 30008	CHIP JUMPER 0603			
3879	© 4822 051 30008	CHIP JUMPER 0603			
3881	© 4822 051 30103	10kΩ	5%	0,06W	
3882	© 4822 051 30103	10kΩ	5%	0,06W	
3890	© 4822 051 30222	2,2kΩ	5%	0,06W	
3891	© 4822 117 11817	1,2kΩ	1%	0,06W	
3892	© 4822 051 30221	220Ω	5%	0,06W	
3893	© 4822 051 30223	22kΩ	5%	0,06W	
3894	© 4822 051 30223	22kΩ	5%	0,06W	
3895	© 4822 051 30103	10kΩ	5%	0,06W	
3951	© 4822 117 13632	100kΩ	1%	0,06W	
3952	© 4822 051 30562	5,6kΩ	5%	0,06W	
3953	© 4822 051 30472	4,7kΩ	5%	0,06W	
3954	© 4822 117 12925	47kΩ	1%	0,06W	
3955	© 4822 117 12925	47kΩ	1%	0,06W	
3957	© 4822 051 30333	33kΩ	5%	0,06W	
3958	© 4822 051 30103	10kΩ	5%	0,06W	
3959	© 4822 051 30562	5,6kΩ	5%	0,06W	
3961	© 4822 051 30392	3,9kΩ	5%	0,06W	
3963	© 2120 108 92008	180kΩ	5%	0,06W	
3967	© 4822 051 30102	1kΩ	5%	0,06W	

COILS

1952	2422 540 98428	CER. RES 8,4672MHz	not for opt.out
1952	4822 242 10339	CRYSTAL 8,4672MHz	only for opt.out
5250	4822 157 11705	10µH 10%	
5251	4822 157 11705	10µH 10%	
5252	4822 157 10532	100µH 5%	

5350	2422 535 91058	215nH 10%	
5351	2422 535 91058	215nH 10%	
5352	2422 535 91058	215nH 10%	
5353	2422 535 91058	215nH 10%	
5400	4822 242 10845	CER. RES. 4,23MHz	

5401	4822 242 10971	DMX-26S (32,768kHz)	
5800	4822 157 11781	FILTER, 100MHz	
5801	4822 157 11781	FILTER, 100MHz	
5806	4822 157 11781	FILTER, 100MHz	
5834	4822 157 11781	FILTER, 100MHz	

5850	4822 157 11781	FILTER, 100MHz	
5880	4822 157 11781	FILTER, 100MHz	

DIODES

6201	4822 130 83757	BAS216	
6250	9322 128 70685	SS14	
6251	4822 130 83757	BAS216	

6252	4822 130 83757	BAS216	
6253	4822 130 83757	BAS216	
6254	4822 130 83757	BAS216	
6255	4822 130 70064	LM285D	
6256	4822 130 82262	BAT54S	

6257	4822 130 10654	BAT254	
6258	9322 128 70685	SS14	
6259	4822 130 11028	BZX284-C4V7	
6261	4822 130 83757	BAS216	
6262	4822 130 10654	BAT254	

6265	4822 130 82594	BAT54C	
6350	4822 130 10794	BZX284-C10	
6400	4822 130 82594	BAT54C	

TRANSISTORS

7200	5322 130 60123	BC807-40	
7201	9340 217 70115	BC847BW	
7251	9340 218 50115	BC857BW	
7252	4822 130 11549	BSH105 ▲	
7253	5322 130 60123	BC807-40	

7254	9340 217 70115	BC847BW	
7260	9340 217 70115	BC847BW	
7263	9340 217 70115	BC847BW	
7264	5322 130 61569	BC868	
7265	9340 217 70115	BC847BW	

7266	9340 217 70115	BC847BW	
7267	9340 218 50115	BC857BW	
7351	9340 217 70115	BC847BW	
7352	9340 217 70115	BC847BW	
7354	5322 130 60123	BC807-40	

7402	9340 218 50115	BC857BW	
7450	9340 218 50115	BC857BW	
7800	9340 218 50115	BC857BW	
7851	9340 218 50115	BC857BW	
7852	9340 217 70115	BC847BW	

7890	9340 218 50115	BC857BW	
7891	9340 218 50115	BC857BW	
7892	9340 217 70115	BC847BW	
7955	5322 130 42756	BC857CW	
7956	5322 130 63679	BC847CW	

7957	9340 217 70115	BC847BW	
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TRANSISTORS

7959	5322 130 42756	BC857CW	
7961	9340 217 70115	BC847BW	
7962	9340 217 70115	BC847BW	
7963	9340 218 50115	BC857BW	

INTEGRATED CIRCUITS

7250	4822 209 17289	74LV14PW	
7262	9322 142 72685	TC75W51FU	
7300	9322 142 72685	TC75W51FU	
7301	9351 750 10118	74LV4066PW	
7350	9322 142 97668	TA2120FN (HEADPHONE AMP.)	

7400	3103 308 84110	TMP86CM29LF-AZT9230.1 (µP)	
7401	9322 143 49668	M24C01-RDW6 (EEPROM)	
7405	9351 750 10118	74LV4066PW	
7406	8203 303 84910	TC75W58FU	
7700	4822 209 16801	MIP805 (EL-DRIVER)	

7807	9352 641 80557	SAA7324H/M2B (CD10 SIGNAL P.)	
7850	9322 142 87671	SM5903BF (NPC DRAM CONTROL)	
7870	4822 209 16518	HYB314400BJ-60 (4Mbit DRAM)	
7870	9322 138 26668	MSM51V17405D-60 (16Mbit DRAM)	
7950	9322 141 02671	MPC17A51VM (SERVO DRIVER)	

7951	9322 142 72685	TC75W51FU	
7958	9322 142 72685	TC75W51FU	