Service
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Service Manual

COMPACT disc DIGITAL AUDIO

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CLASS 1
LASER PRODUCT

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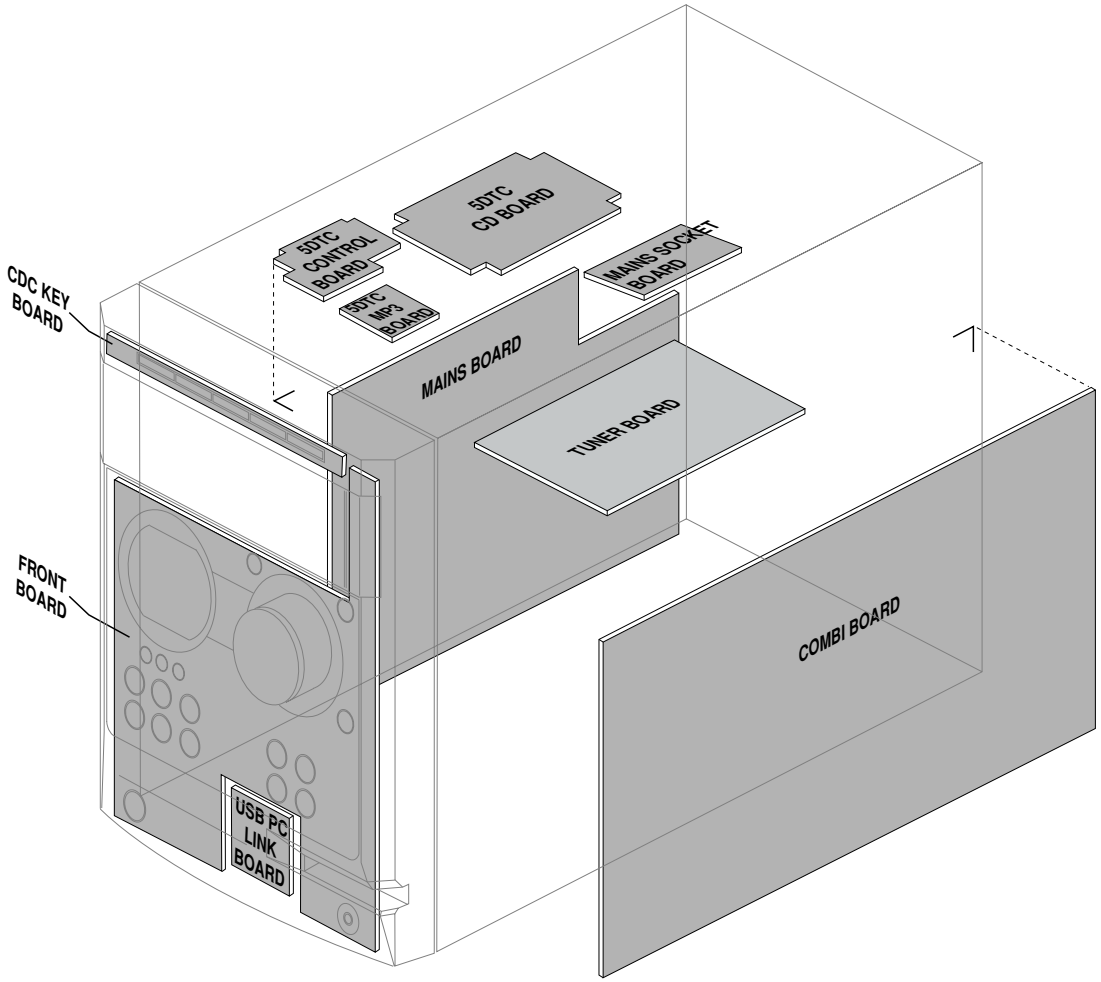
Version 1.0

PHILIPS

LOCATION OF PRINTED CIRCUIT BOARDS



VERSION VARIATIONS:

Type /Versions: / Features & Board in used:	MC-M570									
	/21	/21M	/22	/37						
Aux in / CDR in	x	x	x	x						
Line Out										
Video Out										
Surround Out										
Subwoofer Out										
Power Booster Out										
Digital Out										
Digital in										
Matrix Surround										
RDS			x							
News			x							
Dolby Pro Logic (DPL)										
Incredible Surround										
Karaoke Features										
Voltage Selector	x	x								
ECO Power Standby (Clock Display Off)	x	x	x	x						
ECO6 Tuner Board - Systems Non-Cenelec	x	x		x						
ECO6 Tuner Board - Systems Cenelec			x							
USB PC LINK	x	x	x	x						

SPECIFICATIONS

GENERAL:

Mains voltage : 110-127V/220-240V Switchable for /21/21M
120V for /37
220V for /33
220-230V for /22
230-240V for /30
Mains frequency : 50/60Hz
Clock accuracy : < 4 seconds per day
Dimension centre unit : 175 x 268 x 316mm

Power consumption
Active : 80W for /22/33/37
Active : 90W for /21/21M
Standby : < 15W (DEMO mode off)
ECO Power Standby : < 0.5W for /22/33/37
ECO Power Standby : < 1W for /21/21M

TUNER:

FM

Tuning range : 87.5-108MHz
Grid : 50kHz
100kHz for /37
IF frequency : 10.7MHz ± 25kHz
Aerial input : 75 ohm coaxial
300 ohm click fit for /37
Sensitivity at 26dB S/N : < 7uV
Selectivity at 600kHz bandwidth : > 25dB
Image rejection : > 25dB [> 75dB]
Distortion at RF=1mV, dev. 75kHz : < 3%
-3dB Limiting point : < 8uV
Crosstalk at RF=1mV, dev. 40kHz : > 18dB

MW

Tuning range : 531-1602kHz
530-1700kHz for /21/21M/37
Grid : 9kHz
10kHz for /21/21M/37
IF frequency : 450kHz ± 1kHz
Aerial input : Frame aerial
Sensitivity at 26dB S/N : < 4.4mV/M
Selectivity at 18kHz bandwidth : > 18dB
IF rejection : > 45dB
Image rejection : > 28dB
Distortion at RF=50mV, M=80% : < 5%

AMPLIFIER:

Output power (6 ohm, 1kHz, 10% THD)
L & R : 2 x 100W RMS

Output power (6 ohm, 60Hz-12.5kHz, 10% THD)
L & R : 2 x 95W FTC /37

Frequency response within -3dB : 50Hz-16kHz
MAX Sound : On / Off
Digital Sound Control (DSC) : Jazz / Rock / Pop / Optimal
Virtual Environment Control (VEC) : Cyber Hall / Concert / Cinema / Off

Input sensitivity
Aux in (at 1kHz) : 500mV at 600 ohm
CDR in (at 1kHz) : 1000mV at 600 ohm
USB (at 1kHz) : 830mV at 600 ohm

Output sensitivity
Headphone output at 32 ohm : 15mW ± 2dB (Max. vol.)

5DTC:

Measurement done directly at the connector on the board.
Output Resistance : < 100 ohm
Output Voltage (0dB, 1kHz) : 0.5Vrms ± 1dB (unloaded)
Channel Unbalance : < ±1dB
Channel Separation (1kHz) : > 60dB
Frequency Response (±3dB) : 20Hz-20kHz
Signal to Noise Ratio : > 76dBA
MP3-CD Bit Rate : 32-256 kbps
Sampling Frequencies : 32, 44.1, 48 kHz

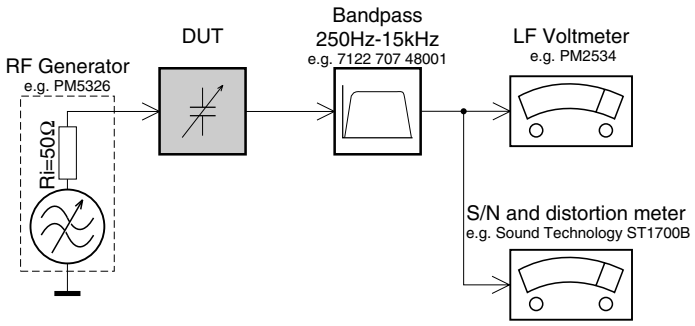
USB:

Measurement done directly at the connector on the board.
Output Resistance : < 1.5 kohm
Output Voltage (0dB, 1kHz) : 830mVrms ± 1.5dB
(R_L = 33 kohm)
Channel Unbalance : < ±1dB
THD + Noise (0dB, 1kHz) : < 0.3%
Channel Separation (0dB, 1kHz) : > 40dB
Frequency Response (±3dB) : 20Hz-20kHz
Signal to Noise Ratio : > 75dBA

[....] Values indicated are for "ECO6 Cenelec Board" only.

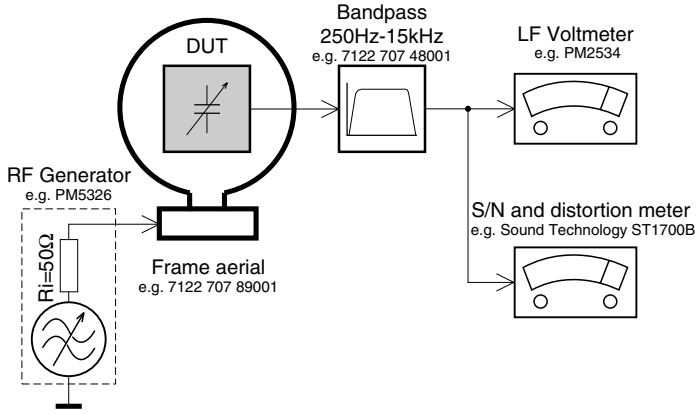
MEASUREMENT SETUP

Tuner FM



Use a bandpass filter to eliminate hum (50Hz, 100Hz) and disturbance from the pilottone (19kHz, 38kHz).

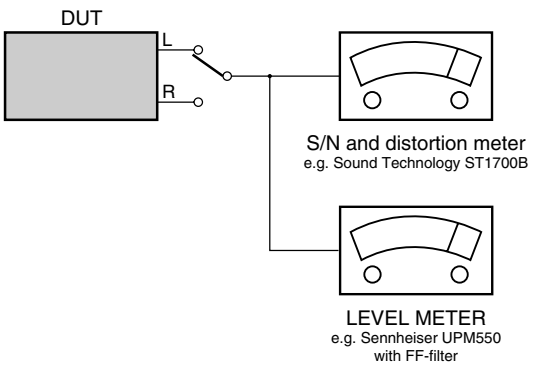
Tuner AM (MW,LW)



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

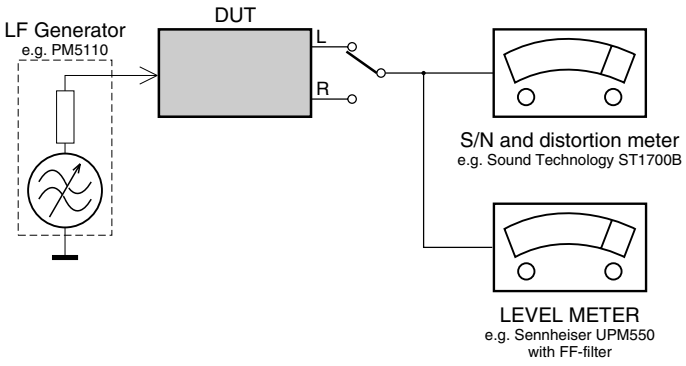
CD

Use Audio Signal Disc SBC429 4822 397 30184
(replaces test disc 3)



Recorder

Use Universal Test Cassette **CrO2** SBC419 4822 397 30069
or Universal Test Cassette **Fe** SBC420 4822 397 30071



SERVICE AIDS

Service Tools:

Universal Torx driver holder 4822 395 91019
Torx bit T10 150mm 4822 395 50456
Torx driver set T6 - T20 ..... 4822 395 50145
Torx driver T10 extended 4822 395 50423

Cassette:

SBC419 Test cassette CrO2 ..... 4822 397 30069
SBC420 Test cassette Fe 4822 397 30071
MTT150 Dolby level 200nWb/M 4822 397 30271

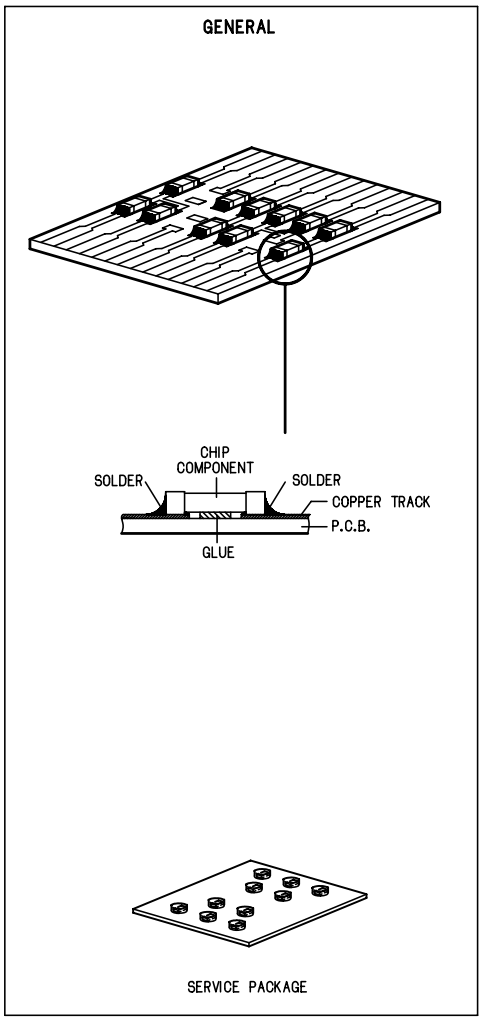
Compact Disc:

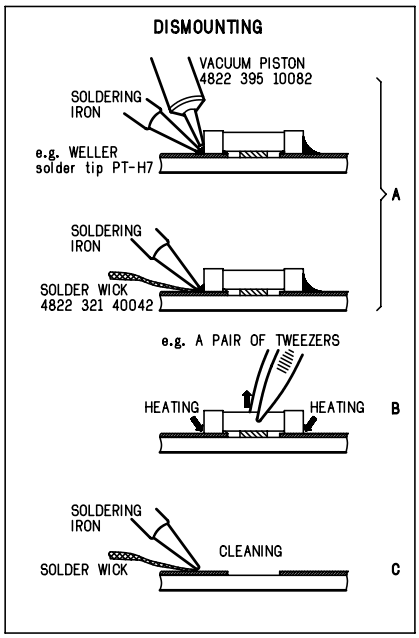
SBC426/426A Test disc 5 + 5A 4822 397 30096
SBC442 Audio Burn-in Test disc 1kHz 4822 397 30155
SBC429 Audio Signals disc 4822 397 30184
Dolby Pro-logic Test Disc 4822 395 10216

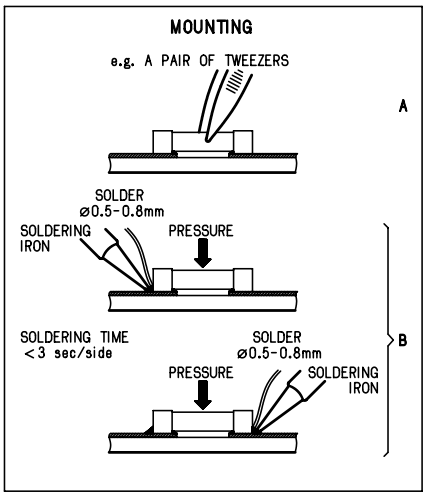
ESD Equipment:

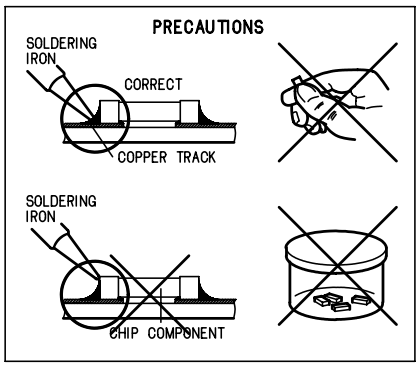
Anti-static table mat - large 1200x650x1.25mm ... 4822 466 10953
Anti-static table mat - small 600x650x1.25mm 4822 466 10958
Anti-static wristband 4822 395 10223
Connector box (1MΩ) 4822 320 11307
Extension cable
(to connect wristband to conn. box) 4822 320 11305
Connecting cable
(to connect table mat to conn. box) 4822 320 11306
Earth cable (to connect product to mat or box) 4822 320 11308
Complete kit ESD3
(combining all above products) 4822 320 10671
Wristband tester 4822 344 13999

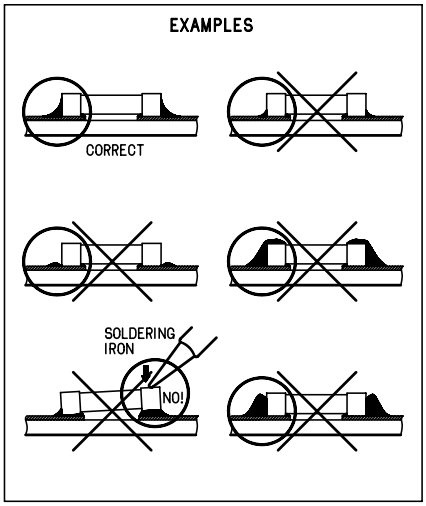
HANDLING CHIP COMPONENTS











ESD

GB WARNING

All ICs and many other semi-conductors 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 wrist wrap with resistance.
Keep components and tools also at this potential.

NL WAARSCHUWING

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).
Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen.
Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.
Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

F ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).
Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.
Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfiler le bracelet serti d'une résistance de sécurité.
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

D WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatischen Entladungen (ESD).
Unsorgfältige Behandlung im Reparaturfall kan die Lebensdauer drastisch reduzieren.
Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.
Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

I AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).
La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.
Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.
Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

GB

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

NL

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

F

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utiliséés les piéces de rechange identiques à celles spécifiées.

D

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

I

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

"After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. 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".

GB Warning !

Invisible laser radiation when open.
Avoid direct exposure to beam.

S Varning !

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

SF Varoitus !

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

DK Advarse !

Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsaettelse for stråling.

DISMANTLING INSTRUCTIONS

Dismantling of the 5DTC Module

1) Loosen 4 screws and remove the Cover Top (pos 255) by sliding it out towards the rear before lifting up.
   - 2 screws on the rear
   - 1 screw each on the left & right side
2) Loosen 3 screws each to remove the Panel Left (pos 253) and Panel Right (pos 254). The Panels are remove by sliding it towards the rear and outwards.
   - 1 screw on the side
   - 2 screws on the rear
3) Take a paper clip or any stiff wire diameter of 1mm-1.5mm. Place the set in position and insert the paper clip or stiff wire as shown in Figure 1.
4) To remove the Cover CD Orn (pos 111), you have to feel and give a push in the correct direction (see Figure 1) and correct position (see Figure 2) to release the catch of the Cover CD Orn before removing it out.
5) Loosen 4 screws A (see Figure 3 and Figure 9) to remove the 5DTC Module (pos 1103).
   - 2 screws on the front
   - 2 screws on the rear

   Note : For information on the 'Emergency opening of the trays' of the 5DTC Module, refer to Chapter 10 (Page 10-7).

Figure 1

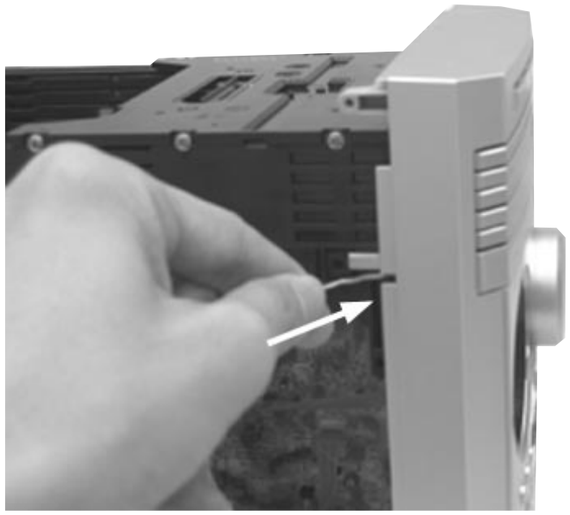
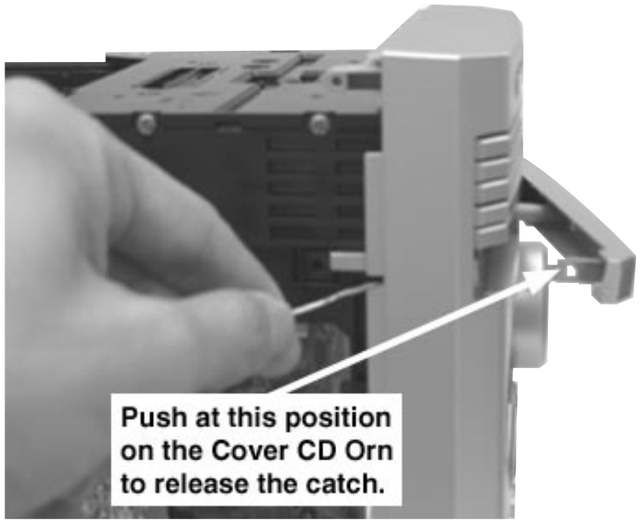
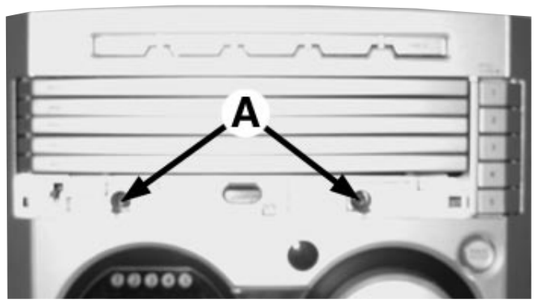


Figure 2



2-1

Figure 3



Detaching the Front Panel assembly from the Bottom/Rear assembly

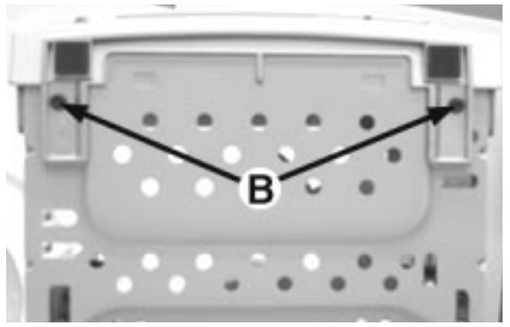


Figure 4

1) Remove 2 screws B (pos 282) as shown in Figure 4 from the bottom of the Cabinet Front (pos 101).
2) Release the fixation of the Combi Board (pos 1102-1001) to Bracket Combi (pos 252) by releasing the 2 catches C1 (see Figure 5) and pulling the Combi Board outwards as shown in Figure 6.
3) Uncatch 2 catches C2 (see Figure 5) on the left & right sides of the Cabinet Front (pos 101) and slides the Front Panel assembly out towards the front.

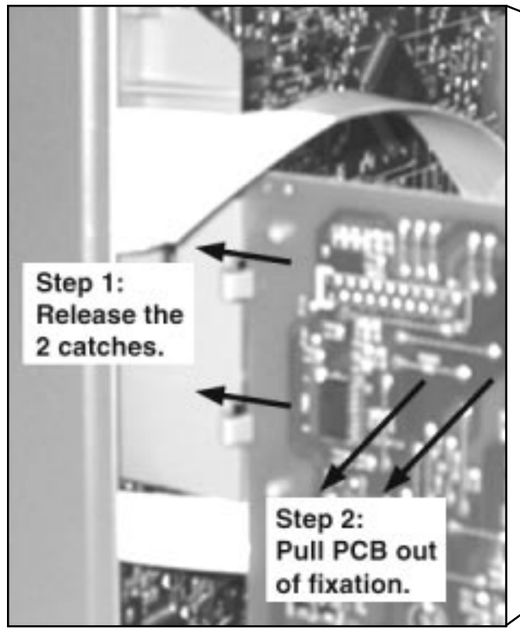


Figure 6

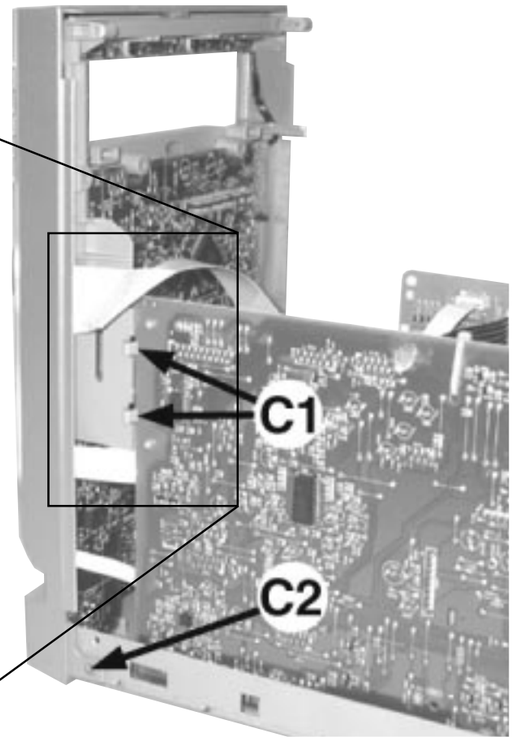


Figure 5

DISMANTLING INSTRUCTIONS

Dismantling of the Front Panel assembly

1) The Knob Volume (pos 136) can be remove by pulling it out in the direction as shown in Figure 7.
2) Loosen 4 screws D (see Figure 8) to remove the Bracket Top (pos 251) and CDC Key Board (pos 1105B).
3) Loosen 2 screws E (see Figure 8) to remove the Bracket Combi (pos 252).
4) Loosen 9 screws F (see Figure 8) to remove the Front Board (pos 1105A).
5) Loosen 3 screws G (see Figure 8) to remove the USB PC LINK Board (pos 1106).

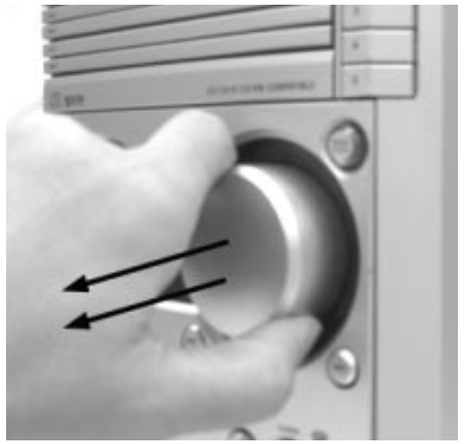
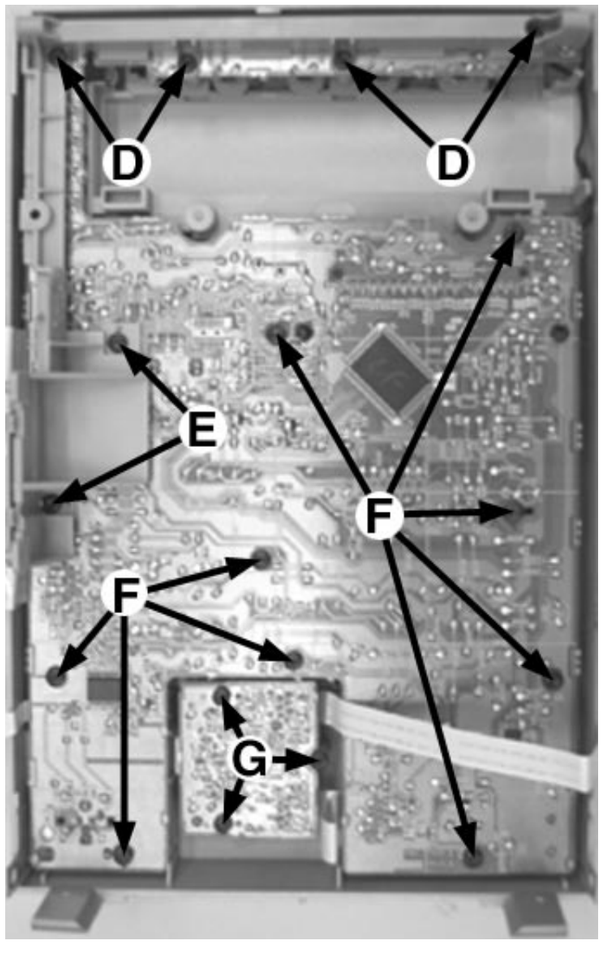


Figure 7

Figure 8



2-2

Dismantling of the Rear Panel assembly

1) Loosen 3 screws H and 2 catches C3 (see Figure 9) to remove the Tuner Board assembly.
2) Loosen 1 screw K (see Figure 9) to free the Mains Socket Board (pos 1102-1002B).
3) Loosen 4 screws J and 2 catches C4 (see Figure 9) to remove the Cabinet Rear (pos 256) by sliding it out towards the rear (see Figuer 10).
   Note : Tuner Board assembly and Mains Socket Board can also be remove together with the Cabinet Rear.
4) Loosen 4 screws L (see Figure 9) to remove the Fan (pos 1104) from the Cabinet Rear.

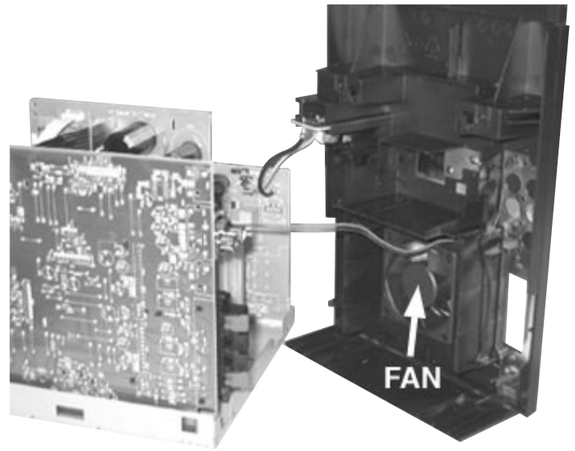
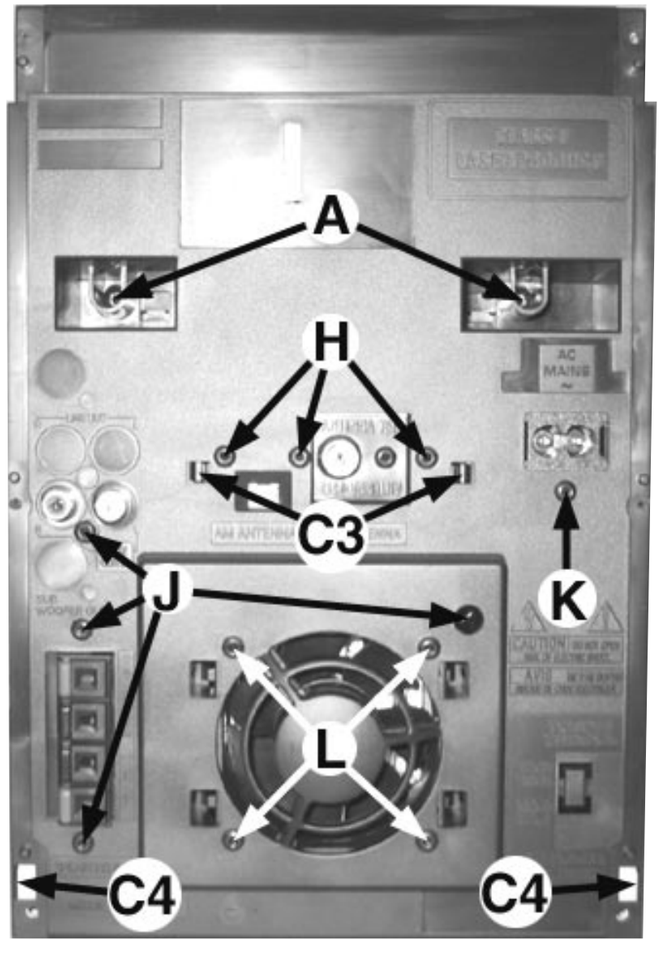


Figure 10

Figure 9



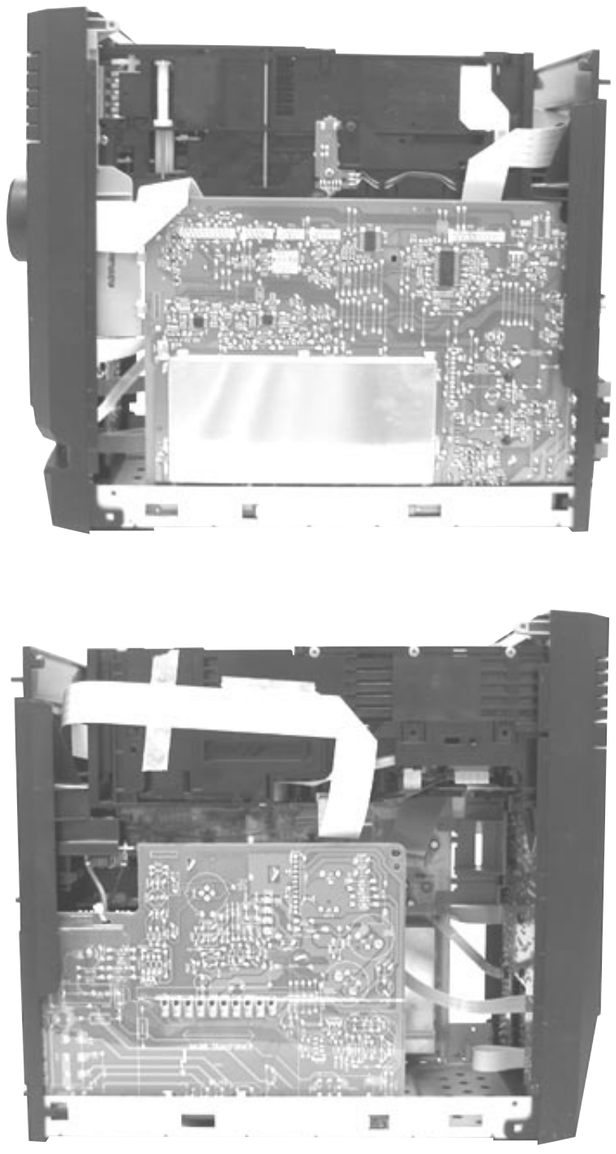
DISMANTLING INSTRUCTIONS

Repair Hints & Service Positions

1) During repair it is possible to disconnect the ECO6 Tuner board and/or 5DTC Module completely unless the fault is suspected to be in that area. This will not affect the performance of the rest of the set.

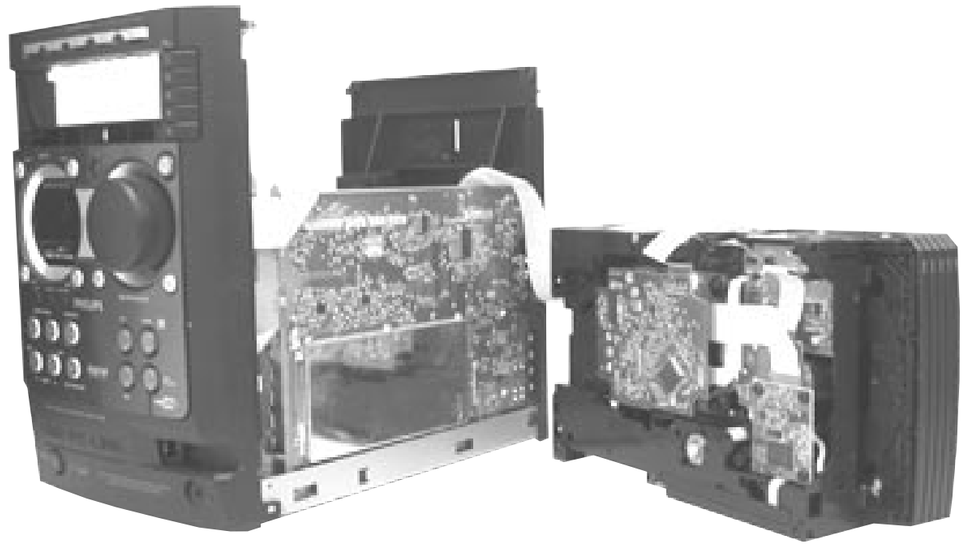
Note: The flex cables are very fragile, care should be taken not to damage them during repair. After repair, be very sure that the flex cables are inserted properly into the flex sockets before encasing, otherwise faults may occurs.

Service position A

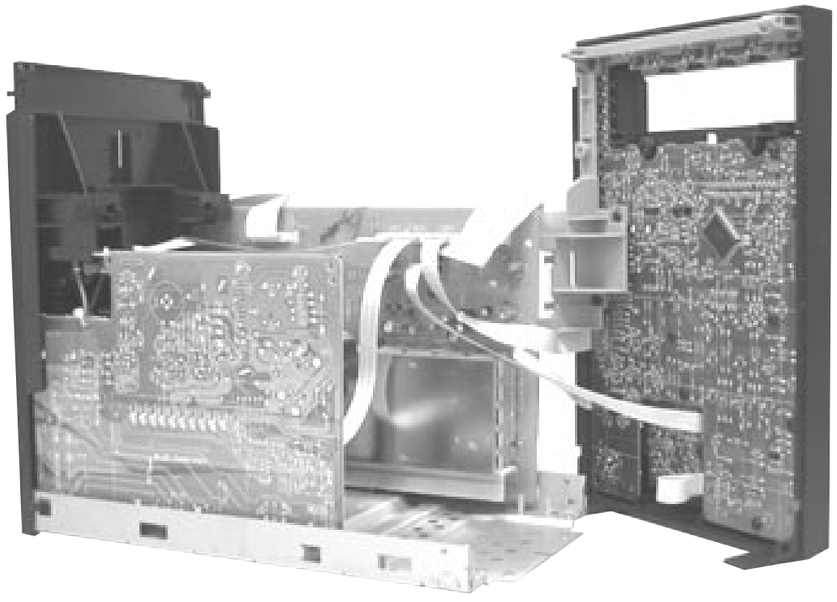


2-3

Service position B

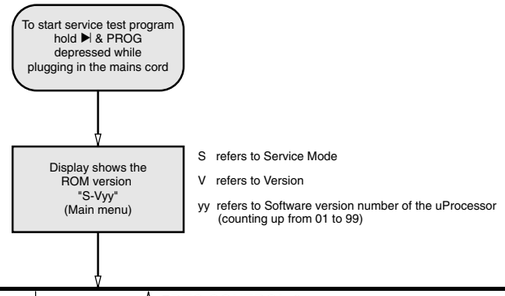


Service position C



3-1

SERVICE TEST PROGRAM



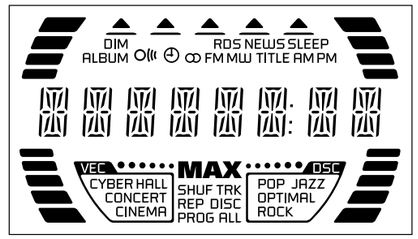


Figure 1

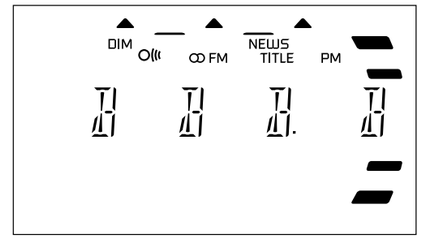
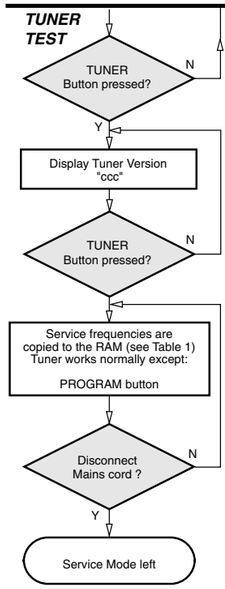
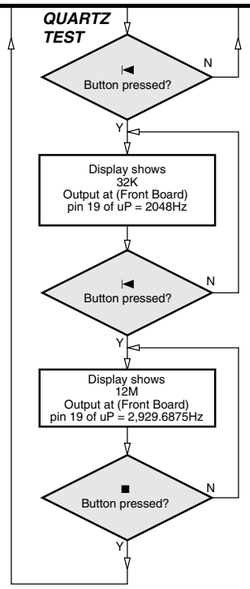
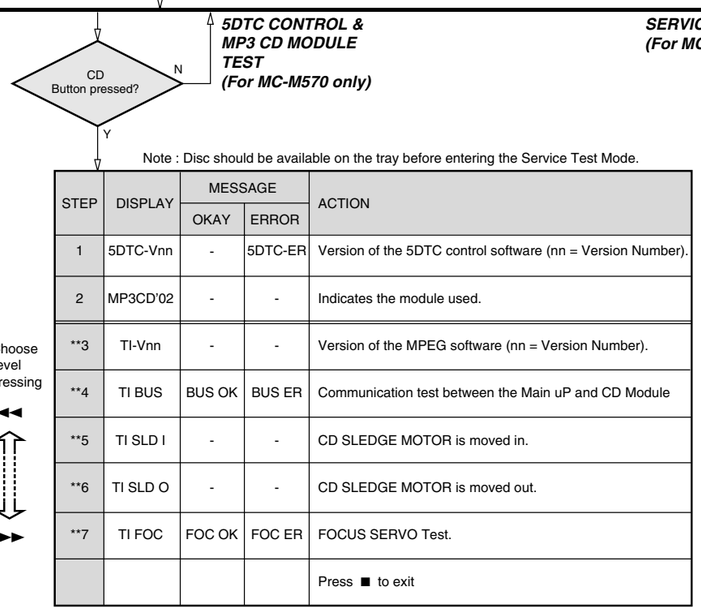


Figure 2

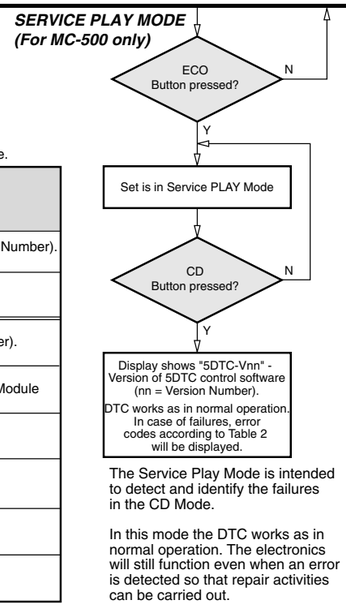






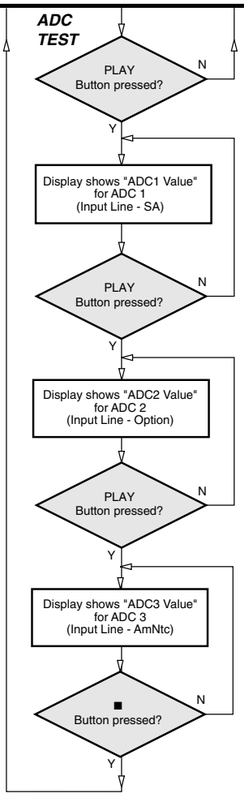
Note : Disc should be available on the tray before entering the Service Test Mode.

STEP	DISPLAY	MESSAGE		ACTION
		OKAY	ERROR	
1	5DTC-Vnn	-	5DTC-ER	Version of the 5DTC control software (nn = Version Number).
2	MP3CD'02	-	-	Indicates the module used.
**3	TI-Vnn	-	-	Version of the MPEG software (nn = Version Number).
**4	TI BUS	BUS OK	BUS ER	Communication test between the Main uP and CD Module
**5	TI SLD I	-	-	CD SLEDGE MOTOR is moved in.
**6	TI SLD O	-	-	CD SLEDGE MOTOR is moved out.
**7	TI FOC	FOC OK	FOC ER	FOCUS SERVO Test.
				Press ■ to exit



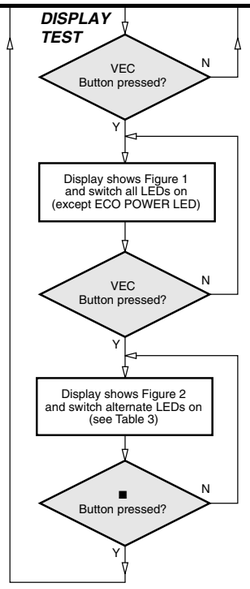
The Service Play Mode is intended to detect and identify the failures in the CD Mode.

In this mode the DTC works as in normal operation. The electronics will still function even when an error is detected so that repair activities can be carried out.



ADC Test is used for checking the ADC inputs to the microprocessor.

The display shows an ADC value between 0 and 255 for an input signal between 0 and 5V.



LEDs	MC-M570	MC-500
CD	OFF	-
TUNER	ON	-
AUX	OFF	-
USB PC LINK	ON	-
MAX SOUND	OFF	OFF
USB Indicator	ON	ON

Table 3

Various other Tests

PRESET	Europe "EUR"	East Europe "EAS"	East Eur. Extended-band "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	87.5MHz	65.81MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	531kHz	74MHz	530kHz	531/530kHz*
4	1602kHz	1602kHz	87.5MHz	1700kHz	1602/1700kHz*
5	558kHz	558kHz	531kHz	560kHz	558/560kHz*
6	1494kHz	1494kHz	1602kHz	1500kHz	1494/1500kHz*
7	87.5MHz	87.5MHz	558kHz	98MHz	87.5/98MHz*
8	87.5MHz	87.5MHz	1494kHz	87.5MHz	87.5MHz
9	87.5MHz	87.5MHz	98MHz	87.5MHz	87.5MHz
10	87.5MHz	87.5MHz	70.01MHz	87.5MHz	87.5MHz
11	98MHz	98MHz	65.81MHz	87.5MHz	98/87.5MHz*

Table 1

Note: * Depending on the selected grid frequency (9 or 10kHz).
By holding the PROG and ►► buttons depressed while switching on the Mains supply, one of the undermentioned features will be activated:
- the tuning grid frequency is toggled between 9kHz and 10kHz for the Oversea (/21) version.
- the extended FM1 (65.81MHz - 74MHz) is toggled on and off for East Eur. (/34) version.

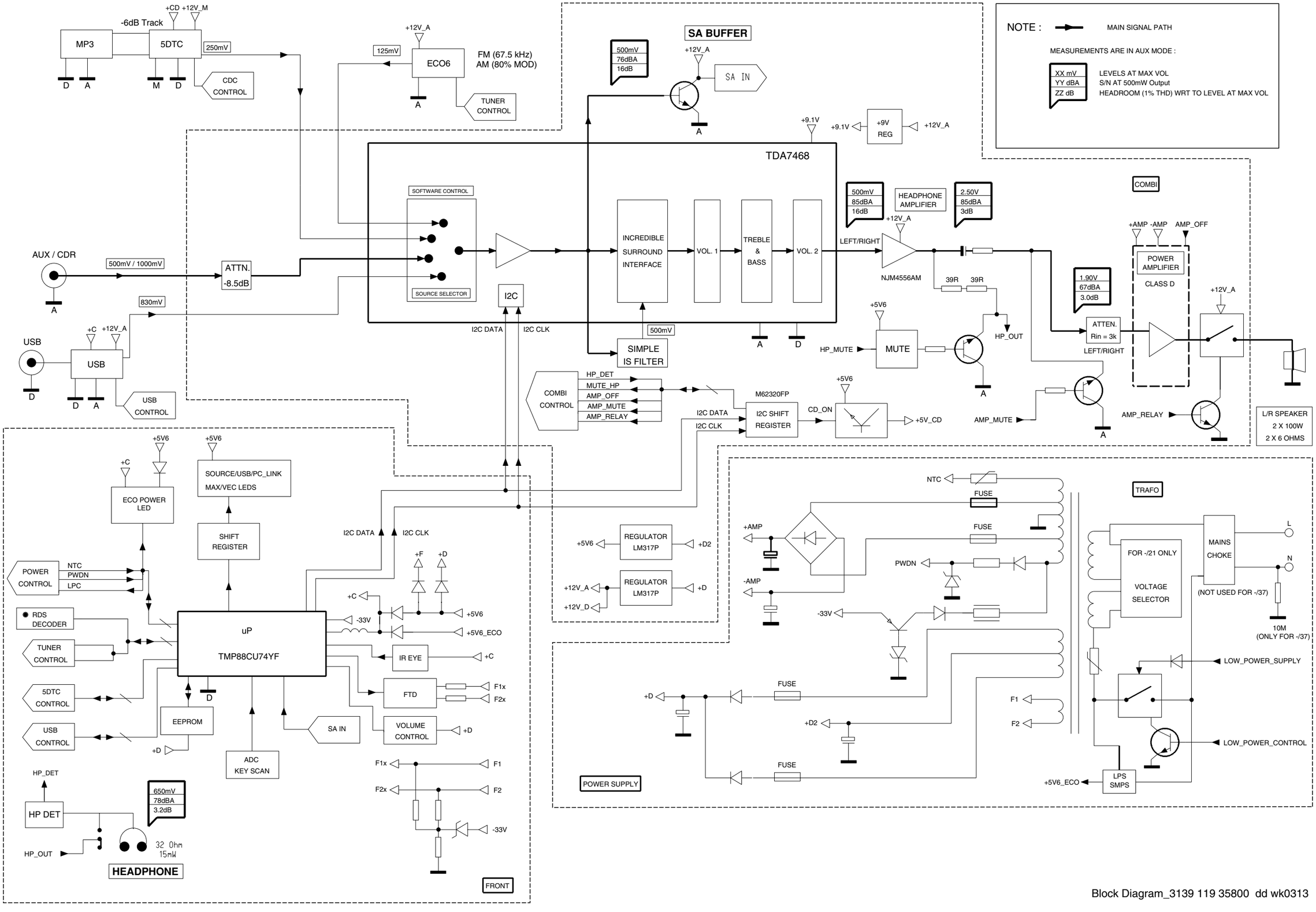
Error code	Error Description
E1000	Focus Error Triggered when the focus cannot be found within a certain time when starting up the CD, or if the focus is lost for more than a certain time during playing of CD.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during playing of CD.
E1002	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 seconds have passed by. Inner-switch or sledge motor problem.
E1003	Sledge Out Error The sledge did not come out of its inner position (inner-switch is still open) before approximately 250ms have passed by. Inner-switch or sledge motor problem.
E1005	Jump Error Triggered in normal play when the jump destination could not be found within a certain time.
E1006	Subcode Error Triggered when a new subcode was missing for a certain time during playing of CD.
E1007	PLL Error The Phase Lock Loop could not lock within a certain time.
E1008	Turntable Motor Error Generated when the CD could not reached 75% of speed during start-up within a certain time. Disc motor problem.
E1020	Focus Search Error The focus point has not been found within a certain time.
E1061	The tray could not enter the inside position and is opening again. This can happen if the tray is blocked such that it cannot go fully inside, or if the 5DTC control module is defective and never closes.
E1079	The tray could not reach the outside position and is stopped at its blocked position. This can happen if the tray is blocked such that it cannot go fully outside, or if the 5DTC control module is defective and never opens.

Table 2

TEST	*Activated with*	*ACTION*
EEPROM TEST	►► ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT TEST	◄◄	Load default data. Display shows "NEW" for 1 second. ***Caution! All presets from the customer will be lost!!***
DEMO TOGGLE	MAX SOUND	Pressing this button will toggle between DEMO ON and DEMO OFF. The DEMO status will scroll once across the Display.
ROTARY ENCODER TEST	Rotary Volume Knob	Display shows value for 2 seconds. Values increases or decreases until Volume Maximum (0dB) or Volume Minimum (VOL MUTE) is reached.
MICRONAS FIRMWARE VERSION	USB PC LINK ■ to Exit	To read out the Firmware Version of IC UAC3553 on the USB PC LINK Board. Display shows "Vxxxx" (xxxx = Firmware Version number).
LEAVE SERVICE TEST PROGRAM	Disconnect mains cord	

4-1

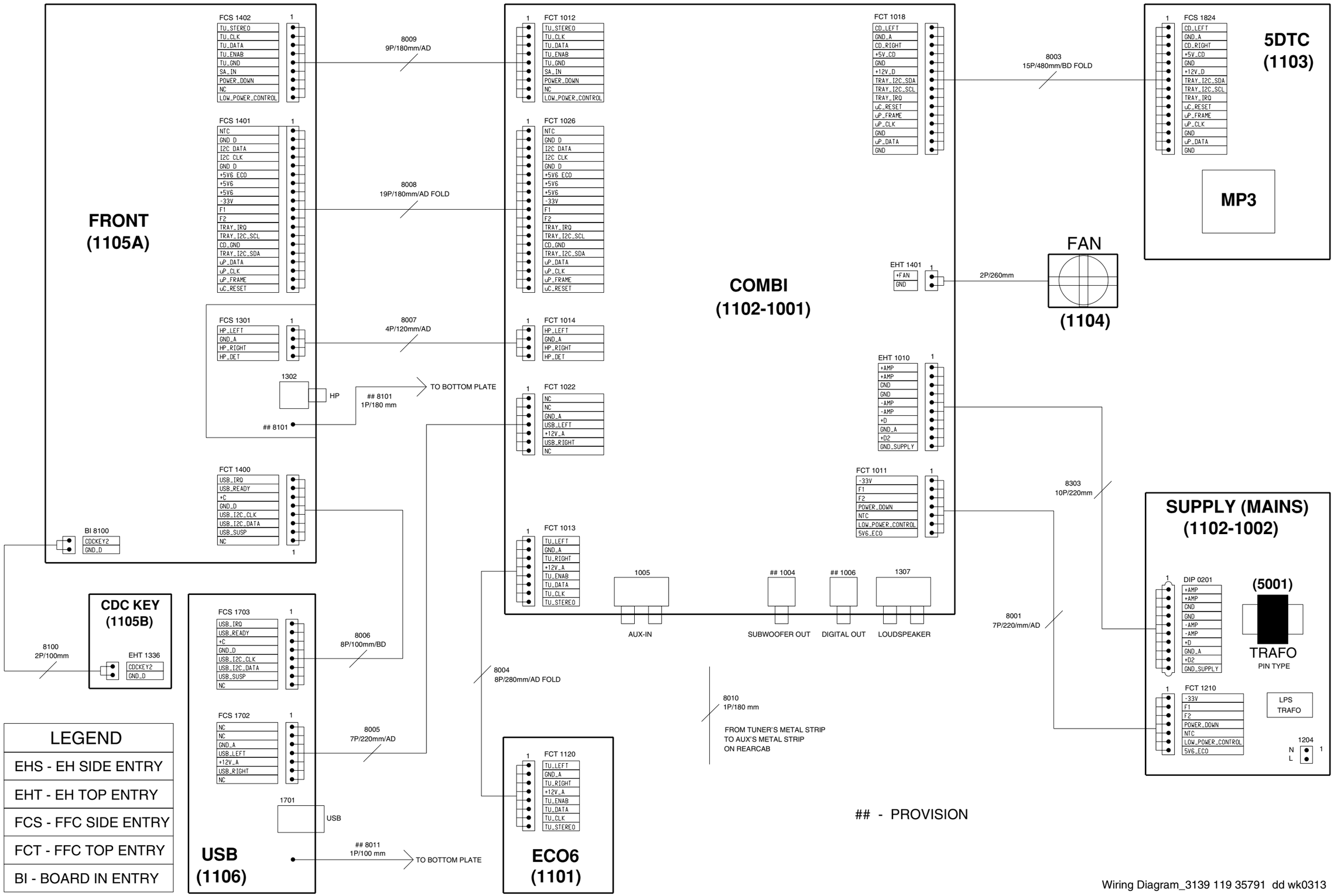
SET BLOCK DIAGRAM



Block Diagram_3139 119 35800 dd wk0313

5-1

SET WIRING DIAGRAM



Wiring Diagram_3139 119 35791 dd wk0313

FRONT BOARD

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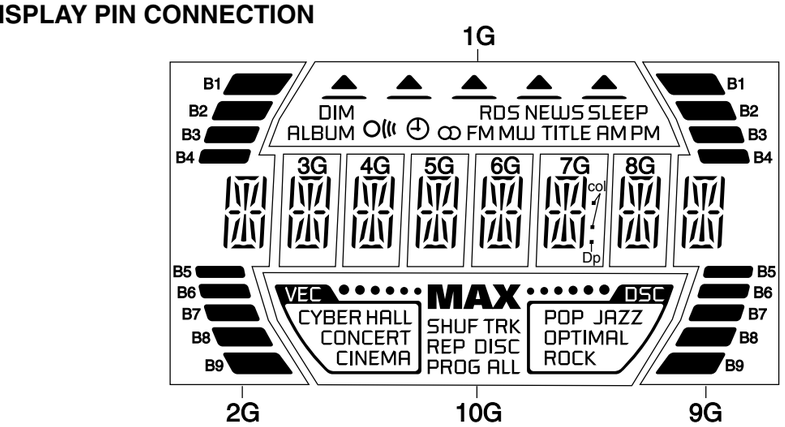
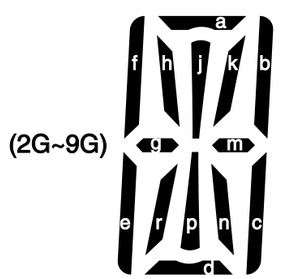
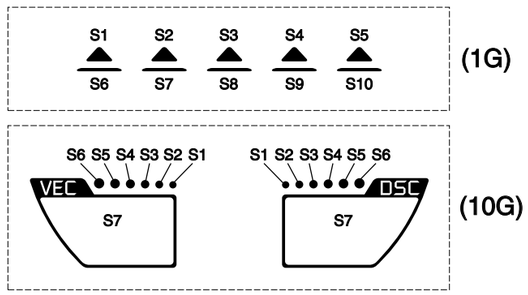
FTD DISPLAY PIN CONNECTION





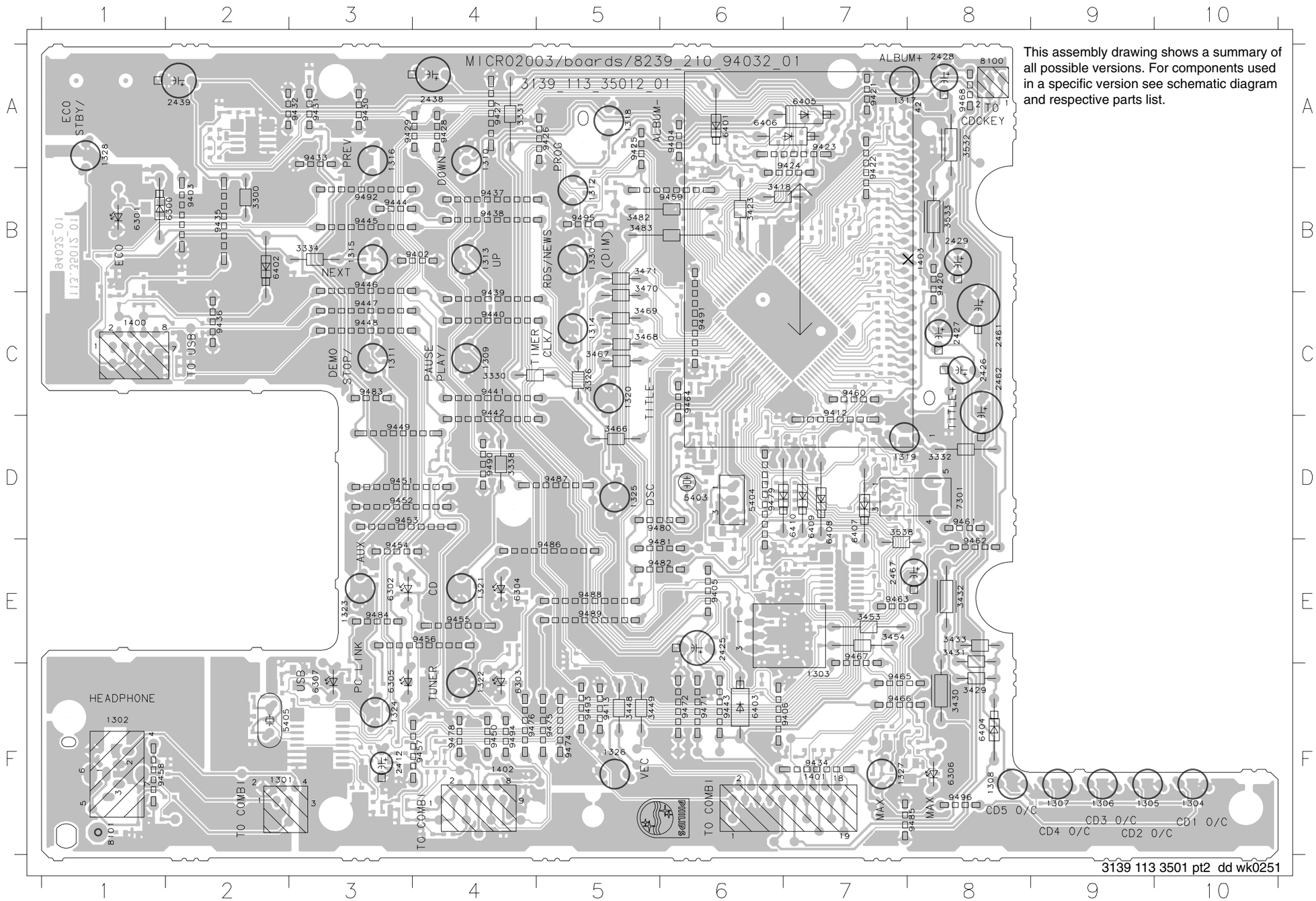


	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G
P1	S1	a	a	a	a	a	a	a	a	S1
P2	S2	h	h	h	h	h	h	h	h	S2
P3	S3	j , p	j , p	j , p	j , p	j , p	j , p	j , p	j , p	S3
P4	S4	k	k	k	k	k	k	k	k	S4
P5	S5	b	b	b	b	b	b	b	b	S5
P6	S6	f	f	f	f	f	f	f	f	S6
P7	S7	m	m	m	m	m	m	m	m	S7
P8	S8	g	g	g	g	g	g	g	g	MAX
P9	S9	c	c	c	c	c	c	c	c	SHUF
P10	S10	e	e	e	e	e	e	e	e	TRK
P11	DIM	r	r	r	r	r	r	r	r	REP
P12	ALBUM	n	n	n	n	n	n	n	n	DISC
P13	O(((	d	d	d	d	d	d	d	d	PROG
P14	🕘	B1	-	-	-	-	col	-	B1	ALL
P15	∞	B2	-	-	-	-	Dp	-	B2	CYBER
P16	RDS	B3	-	-	-	-	-	-	B3	HALL
P17	NEWS	B4	-	-	-	-	-	-	B4	CONCERT
P18	SLEEP	B5	-	-	-	-	-	-	B5	CINEMA
P19	FM	B6	-	-	-	-	-	-	B6	POP
P20	MW	B7	-	-	-	-	-	-	B7	JAZZ
P21	TITLE	B8	-	-	-	-	-	-	B8	OPTIMAL
P22	AM	B9	-	-	-	-	-	-	B9	ROCK
P23	PM	-	-	-	-	-	-	-	-	-

6-2

FRONT BOARD - COMPONENT LAYOUT

1301	F2	1310	A4	1319	D7	1328	A1	2427	C8	3326	C5	3430	F8	3467	C5	3538	D7	6305	F3	6407	D7	9404	A6	9424	A7	9433	A3	9442	C4	9451	D3	9460	C7	9471	F6	9482	E5	9491	C6
1302	F1	1311	C3	1320	C5	1330	B5	2428	A8	3330	C4	3431	E8	3468	C5	5403	D6	6306	F8	6408	D7	9405	E6	9425	A5	9434	F7	9443	F6	9452	D3	9461	D8	9472	F6	9483	C3	9492	B3
1303	F7	1312	B5	1321	E4	1400	C1	2429	B8	3331	A4	3432	E8	3469	C5	5404	D6	6307	F3	6409	D7	9406	F7	9426	A5	9435	B2	9444	B3	9453	D3	9462	E8	9474	F5	9484	E3	9493	F5
1304	F10	1313	B4	1322	F4	1401	F7	2438	A4	3332	D8	3433	E8	3470	B5	5405	F2	6401	A6	6410	D7	9412	C7	9427	A4	9436	C2	9445	B3	9454	E3	9463	E7	9475	F5	9485	F8	9494	F4
1305	F9	1314	C5	1323	E3	1402	F4	2439	A2	3334	B3	3448	F5	3471	B5	6300	B2	6402	B2	7301	D8	9413	F5	9428	A4	9437	B4	9446	B3	9455	E4	9464	C6	9476	F4	9486	E5	9495	B5
1306	F9	1315	B3	1324	F3	1403	B8	2461	C8	3338	D4	3449	F5	3482	B5	6301	B1	6403	F6	8100	A8	9420	B8	9429	A3	9438	B4	9447	C3	9456	E4	9465	F7	9478	F4	9487	D5	9496	F8
1307	F9	1316	A3	1325	D5	2412	F3	2462	C8	3418	B6	3453	E7	3483	B5	6302	E3	6404	F8	8101	F1	9421	A7	9430	A3	9439	C4	9448	C3	9457	F4	9466	F7	9479	D6	9488	E5		
1308	F8	1317	A7	1326	F5	2425	E6	2467	E7	3423	B6	3454	E7	3532	A8	6303	F4	6405	A7	9402	B4	9422	A7	9431	A3	9440	C4	9449	D3	9458	F1	9467	E7	9480	D5	9489	E5		
1309	C4	1318	A5	1327	F7	2426	C8	3300	B2	3429	F8	3466	D5	3533	B8	6304	E4	6406	A6	9403	B2	9423	A7	9432	A3	9441	C4	9450	F4	9459	B6	9468	A8	9481	E5	9490	D4		



This assembly drawing shows a summary of all possible versions. For components used in a specific version see schematic diagram and respective parts list.

6-3

FRONT BOARD - CHIP LAYOUT

| | | |

6-4

FRONT BOARD - CIRCUIT DIAGRAM (Part 1)

Front Board
Circuit Diagram (Part 1)

Note : DC Voltages During Active Play.
Values in Bracket are DC Voltages at Standby (Clock Mode).
Values in Square Bracket are DC Voltages at Low Power Standby.

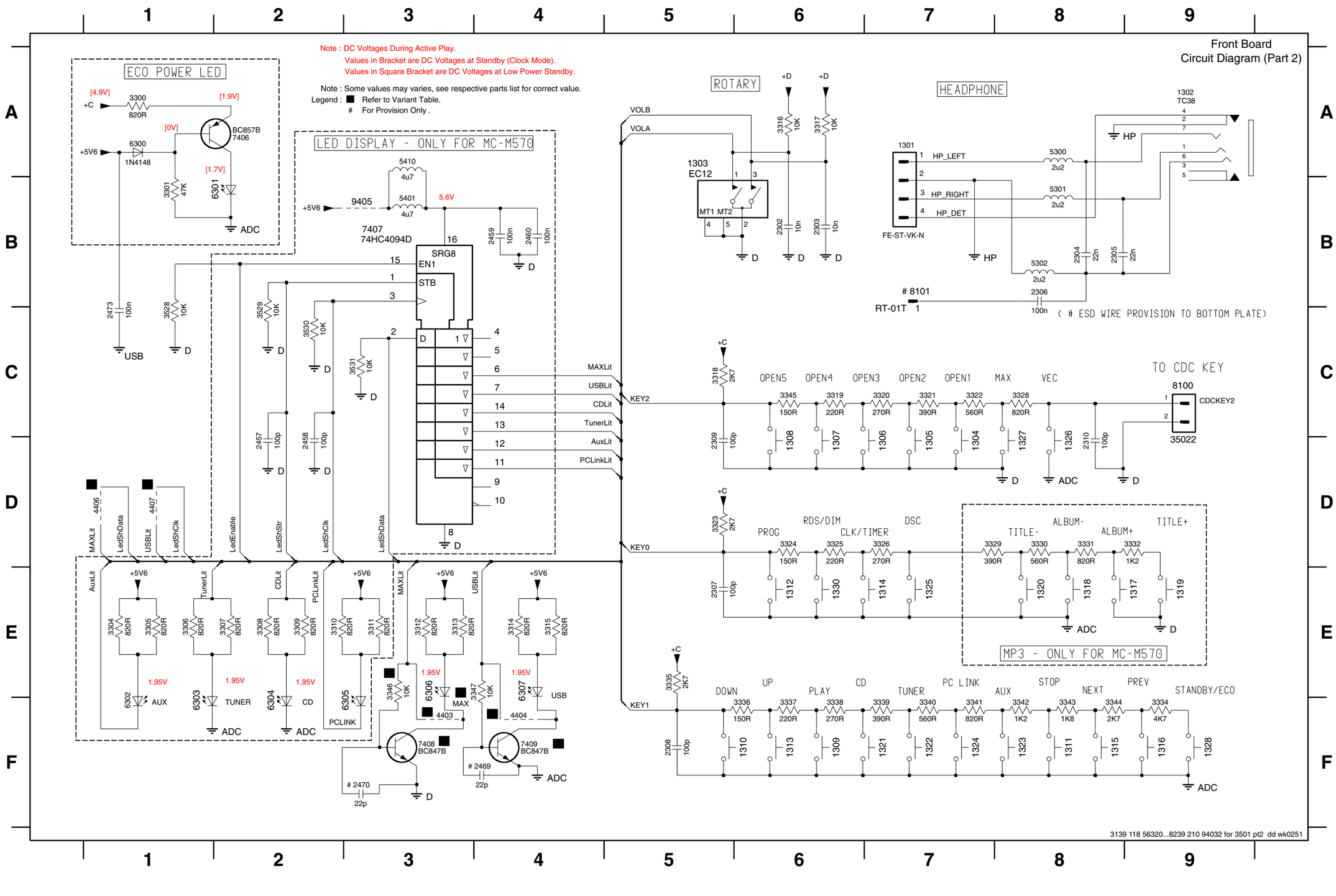
Note : Some values may varies, see respective parts list for correct value.
Legend : ■ Refer to Variant Table.
For Provision Only .

1400 F13 3508 B5
1403 A10 3509 B5
2400 A5 3510 B5
2401 A5 3511 B5
2402 A3 3512 B5
2403 A4 3513 B4
2406 C2 3514 B4
2407 C1 3515 B4
2408 I1 3516 B4
2409 I2 3517 B3
2410 G1 3518 B4
2411 H1 3519 C3
2412 G3 3520 C4
2413 G12 3521 C3
2415 G2 3522 D4
2416 F1 3523 D3
2418 G5 3524 D4
2419 E6 3525 D3
2420 F6 3526 E4
2421 F7 3527 E4
2422 I11 3534 E9
2423 I12 3536 E12
2424 I12 3537 E12
2440 G11 3538 C12
2441 G11 3539 D11
2443 G12 3540 D11
2444 G12 3541 A3
2445 G13 3542 A4
2455 H8 3544 E4
2456 F7 3545 E4
2461 E3 3546 F5
2462 E3 4400 G8
2465 G11 4401 F11
2466 D11 4402 F11
2467 C12 4410 F11
2471 G3 4411 E12
2479 F6 4412 A5
2483 E12 5403 E6
3401 A4 5404 E6
3402 A5 5405 I2
3403 E9 5406 G1
3404 C2 5407 H7
3405 C1 5408 F12
3406 C2 5411 F11
3407 G1 6401 C1
3408 G1 6402 E11
3409 I2 6407 D4
3410 I1 6408 D3
3413 H12 6409 D4
3416 H3 6410 D3
3417 H3 7301 D12
3418 H3 7400 E8
3419 H3 7401 H8
3420 G7 7403 G1
3421 H11 7404 G6
3422 H12 7405 I12
3423 G7 9402 H6
3424 I12 9403 H5
3425 H7 9404 H6
3426 I7 9406 I6
3427 H9 9412 H5
3428 H9 9422 A4
3437 G8 9430 I5
3438 G8 9435 E12
3439 G9 9457 G3
3457 E4
3458 F4
3459 F4
3460 F4
3461 F4
3462 F4
3463 G5
3464 G8
3465 F9
3466 F9
3467 F9
3468 F9
3469 F9
3470 F9
3471 F9
3472 E9
3473 E9
3474 E8
3475 E9
3476 E9
3477 D9
3478 D9
3479 D9
3480 D9
3481 D9
3482 D9
3483 D9
3484 C9
3485 C9
3486 C9
3487 C9
3489 B8
3490 B8
3491 B8
3492 B8
3493 B8
3494 B7
3495 B7
3496 B7
3497 B7
3498 B7
3499 B7
3500 B7
3501 B6
3502 B6
3503 B6
3504 B6
3505 B6
3506 B6
3507 B6

6-5

FRONT BOARD - CIRCUIT DIAGRAM (Part 2)

1301 A7	1306 D7	1311 F8	1316 F9	1321 F7	1326 D8	2303 B6	2308 F5	2459 B4	3300 A1	3307 E2	3312 E3	3317 A6	3322 C7	3328 C8	3334 F9	3339 F7	3344 F8	3529 C2	4406 D1	5401 B3	6303 F1	7406 A2	8101 B7
1302 A9	1307 D6	1312 E6	1317 E9	1322 F7	1327 D8	2304 B8	2309 D5	2460 B4	3301 B1	3308 E2	3313 E3	3318 C5	3323 D5	3329 D7	3335 E5	3340 F7	3345 C6	3530 C2	4407 D1	5410 A3	6304 F2	7407 B3	9405 B3
1303 A5	1308 D6	1313 F6	1318 E8	1323 F8	1328 F9	2305 B8	2310 D8	2469 F4	3304 E1	3309 E2	3314 E4	3319 C6	3324 D6	3330 D8	3336 F6	3341 F7	3346 E3	3531 C3	5300 A8	6300 A1	6305 F3	7408 F3	
1304 D7	1309 F6	1314 E7	1319 E9	1324 F7	1330 E6	2306 B8	2457 D2	2470 F3	3305 E1	3310 E2	3315 E4	3320 C7	3325 D6	3331 D8	3337 F6	3342 F8	3347 E4	4403 F3	5301 B8	6301 B2	6306 E3	7409 F4	
1305 D7	1310 F6	1315 F8	1320 E8	1325 E7	2302 B6	2307 E5	2458 D2	2473 C1	3306 E1	3311 E3	3316 A6	3321 C7	3326 D7	3332 D9	3338 F6	3343 F8	3528 C1	4404 F4	5302 B8	6302 F1	6307 E4	8100 C9	



6-6

FRONT BOARD - CIRCUIT DIAGRAM (Part 3)

Front Board
Circuit Diagram (Part 3)

TO COMBI

MP3	NON-MP3
	NTC
	GND_IIC
	IIC_DATA
	IIC_CLK
	GND_D
	+5V6_ECO
	+5V6
	+5V6
	-33V
	F1
	F2
	TRAY_IRQ
	TRAY_IIC_SCL
	CD_GND
TRAY_IIC_SDA	CD_SIDA
uP_DATA	CD_SICL
uP_CLK	CD_SILD
uP_FRAME	CD_RAB
uC_RESET	CD_PORE

1401 FE-ST-VK-N

9413 I2C I2C IIC

2446 10p # 2447 10p IIC

3448 220R IIC_DATA

3449 220R IIC_CLK

D

0V [5.6V] +5V6_ECO

+5V6 5.6V

-33V -33V

F1 5.7Vac

F2 5.7Vac

3450 470R TRAY_IRQ

3451 470R TRAY_IIC_SCL

ESD PROVISION
2448 47p D 2449 47p

2464 100n CD

4408

3452 470R TRAY_IIC_SDA_CD_SIDA

3453 470R CD_SICL__uP_DATA

3454 470R CD_SILD__uP_CLK

3455 470R CD_RAB__uP_FRAME

3456 470R CD_PORE__uC_RESET

4409
2450 47p 2451 10p 2452 10p 2453 10p 2454 10p D

FOR ESD PROVISION ONLY

NTC IIC_DATA IIC_CLK TRAY_IRQ TRAY_IIC_SCL TRAY_IIC_SDA_CD_SIDA CD_SICL__uP_DATA CD_SILD__uP_CLK CD_RAB__uP_FRAME CD_PORE__uC_RESET

+C +D

3547 39K 3440 10K 3441 10K 3442 10K 3447 10K

TUSTEREO TUCLK TUDATA TUCE TUENABLE SA_IN PWDN Standby

3443 1K 3444 1K 3445 1K 3543 1K 2432 100p

3548 47K 2433 47p 2434 47p 2435 47p 2436 47p 4405 TU

D

FOR ESD PROVISION ONLY

TO COMBI

1402 FE-ST-VK-N

1 TU_STEREO
2 TU_CLK
3 TU_DATA
4 TU_ENABLE
5 TU_GND
6 SA_IN
7 POWER_DOWN
8 NC
9 LOW_PWR_CTRL

+5V6_ECO 6405 1N4003 5402 4u7 5409 4u7 +H +5V
2480 100n 2438 47u 16V 2437 100n D D

+5V6 6403 1N4003 +D +5V
2425 47u 16V 2463 100n 2478 100n D

+5V6 6406 1N4003 +C +5V
2472 100n 2439 47u 16V 2468 100n # 2481 100n 2482 100n D D

4.5Vac F1 3429 220R 3430 6R8 3432 10R F1x 2.5Vac
2426 47u 50V # 2474 220p
2427 47u 50V # 2475 220p FTD

4.5Vac F2 3431 220R 3532 6R8 3533 10R F2x 2.5Vac
2428 47u 50V # 2476 220p
2429 47u 50V # 2477 220p
3433 22K 6404 BZX79-B5V6 -33V FTD

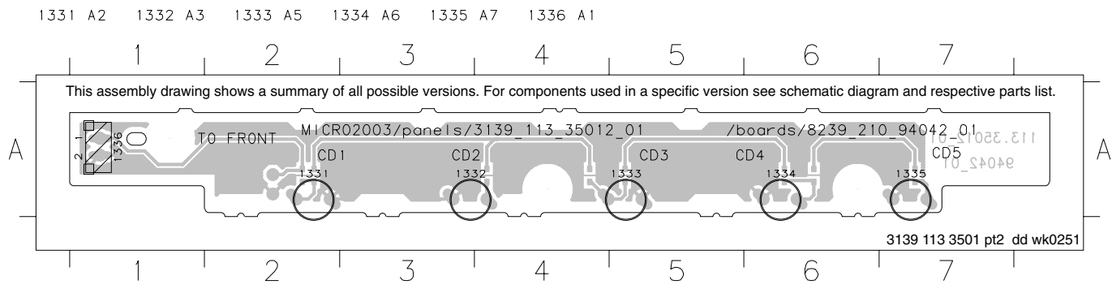
Note : DC Voltages During Active Play.
Values in Bracket are DC Voltages at Standby (Clock Mode).
Values in Square Bracket are DC Voltages at Low Power Standby.

Note : Some values may varies, see respective parts list for correct value.
Legend : ■ Refer to Variant Table.
For Provision Only .

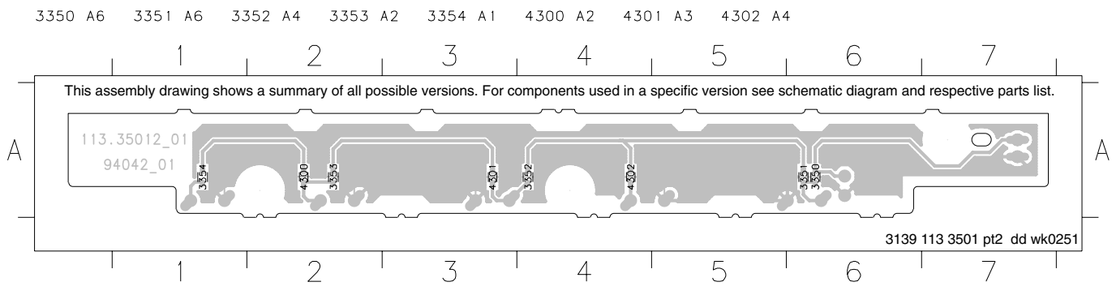
3139 118 56320...8239 210 94032 for 3501 pt2 dd wk0251

1401 A2
1402 A8
2425 E5
2426 D8
2427 E8
2428 E8
2429 F8
2432 B7
2433 C6
2434 C6
2435 C7
2436 C7
2437 E3
2438 E3
2439 F2
2446 A4
2447 A4
2448 B4
2449 B5
2450 D3
2451 D3
2452 D3
2453 D3
2454 D4
2463 E5
2464 C3
2468 F3
2472 F2
2474 D8
2475 E8
2476 E8
2477 F8
2478 E5
2480 E2
2481 F3
2482 F3
3429 D7
3430 D8
3431 F7
3432 D8
3433 F7
3440 A6
3441 A6
3442 A7
3443 A8
3444 B7
3445 B8
3447 A7
3448 B4
3449 B4
3450 B4
3451 B4
3452 C4
3453 C3
3454 C3
3455 C3
3456 D3
3532 E8
3533 F8
3543 B7
3547 A6
3548 C6
4405 C8
4408 C4
4409 D4
5402 E3
5409 E3
6403 E4
6404 F7
6405 E2
6406 F2
9413 A3

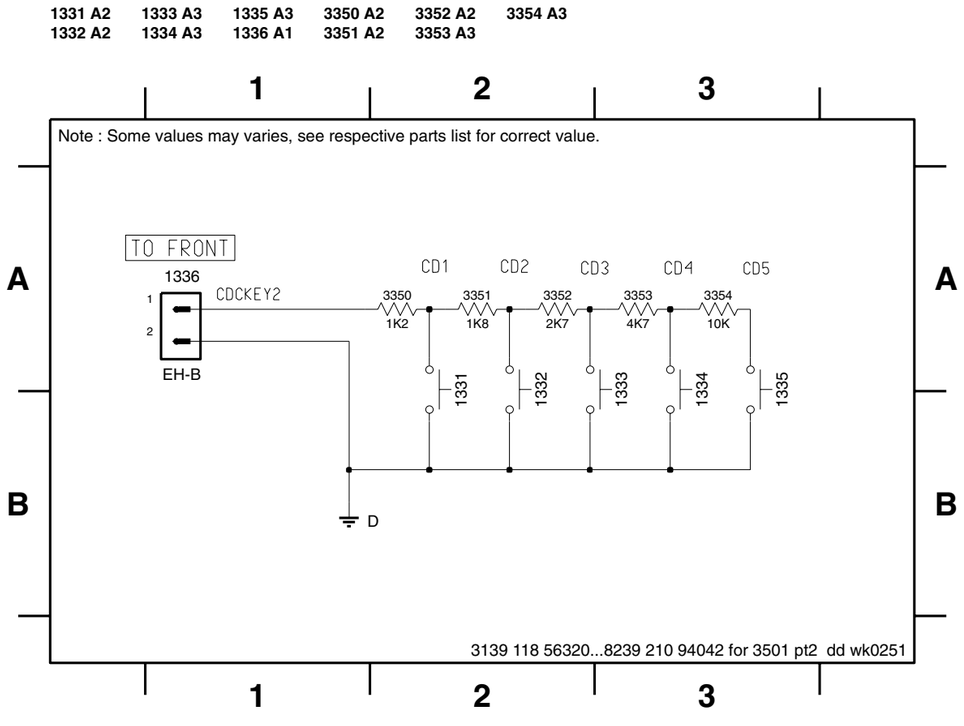
CDC KEY BOARD - COMPONENT LAYOUT



CDC KEY BOARD - CHIP LAYOUT



CDC KEY BOARD - CIRCUIT DIAGRAM



6-7

VARIANT TABLE

Model / Version / Item No.	MC-500/22 MC-500/25	MC-500/30 MC-500/33 MC-500/37	MC-M570/22	MC-M570/21 MC-M570/33 MC-M570/37
3346	10K	10K	—	—
3347	10K	10K	—	—
3413	100K	—	100K	100K
3403 / 3534	1K8	1K8	—	—
3406	33K	33K	15K	15K
3418	—	10K	—	10K
3419	—	10K	—	10K
3423	1K8	—	1K8	1K8
3437	680K	680K	—	—
3438	1M	1M	2M2	2M2
3439	1M	1M	—	—
3452	—	—	470R	470R
3545	10K	10K	—	—
3547	39K	—	—	—
4400	—	—	X	X
4403	—	—	X	X
4404	—	—	X	X
4406	X	X	—	—
4407	X	X	—	—
4408	X	X	—	—
6405	X	—	X	X
6407	—	—	X	X
7408	X	X	—	—
7409	X	X	—	—

X - Item in use.

6-8

ELECTRICAL PARTS LIST - FRONT BOARD

ELECTRICAL PARTS LIST - FRONT BOARD

MISCELLANEOUS

1301	4822 265 11183	Flex Connector 4P	
1302	2422 026 05059	Headphone Socket	
1303	2422 129 16708	Rotary Encoder 24P	
1304	4822 276 13775	Tact Switch	
1305	4822 276 13775	Tact Switch	
1306	4822 276 13775	Tact Switch	
1307	4822 276 13775	Tact Switch	
1308	4822 276 13775	Tact Switch	
1309	4822 276 13775	Tact Switch	
1310	4822 276 13775	Tact Switch	
1311	4822 276 13775	Tact Switch	
1312	4822 276 13775	Tact Switch	
1313	4822 276 13775	Tact Switch	
1314	4822 276 13775	Tact Switch	
1315	4822 276 13775	Tact Switch	
1316	4822 276 13775	Tact Switch	
1317	4822 276 13775	Tact Switch	
1318	4822 276 13775	Tact Switch	
1319	4822 276 13775	Tact Switch	
1320	4822 276 13775	Tact Switch	
1321	4822 276 13775	Tact Switch	
1322	4822 276 13775	Tact Switch	
1323	4822 276 13775	Tact Switch	
1324	4822 276 13775	Tact Switch	
1325	4822 276 13775	Tact Switch	
1326	4822 276 13775	Tact Switch	
1327	4822 276 13775	Tact Switch	
1328	4822 276 13775	Tact Switch	
1330	4822 276 13775	Tact Switch	
1331	4822 276 13775	Tact Switch	
1332	4822 276 13775	Tact Switch	
1333	4822 276 13775	Tact Switch	
1334	4822 276 13775	Tact Switch	
1335	4822 276 13775	Tact Switch	
1400	4822 265 11535	Flex Connector 8P	
1401	4822 265 11545	Flex Connector 19P	
1402	4822 265 11531	Flex Connector 9P	
1403	3139 110 53291	FTD (BJ897GNK)	

CAPACITORS

2302	5322 126 11583	10nF 10% 50V	
2303	5322 126 11583	10nF 10% 50V	
2304	4822 126 14494	22nF 10% 25V	
2305	4822 126 14494	22nF 10% 25V	
2306	2238 586 59812	100nF 50V	
2307	2020 552 94427	100pF 5% 50V	
2308	2020 552 94427	100pF 5% 50V	
2309	2020 552 94427	100pF 5% 50V	
2310	2020 552 94427	100pF 5% 50V	
2406	3198 017 41050	1uF 10V	
2407	4822 126 13879	220nF +80/-20% 16V	
2408	4822 126 11785	47pF 5% 50V	/22
2409	4822 126 11785	47pF 5% 50V	/22
2410	4822 126 14249	560pF 10% 50V	/22
2411	4822 126 14249	560pF 10% 50V	/22
2412	4822 124 22652	2,2uF 20% 50V	/22
2413	2238 586 59812	100nF 50V	
2415	2238 586 59812	100nF 50V	/22
2416	5322 126 11578	1nF 10% 50V	/22
2418	2222 867 15339	33pF 5% 50V	
2419	4822 122 33761	22pF 5% 50V	
2420	4822 122 33761	22pF 5% 50V	
2421	4822 126 14223	2,2pF 50V	
2422	5322 126 11583	10nF 10% 50V	
2423	3198 017 44740	470nF 10V	
2424	5322 126 11583	10nF 10% 50V	
2425	4822 124 81286	47uF 20% 16V	
2426	4822 124 12032	4,7uF 20% 50V	
2427	4822 124 12032	4,7uF 20% 50V	
2428	4822 124 12032	4,7uF 20% 50V	
2429	4822 124 12032	4,7uF 20% 50V	
2432	2020 552 94427	100pF 5% 50V	
2437	2238 586 59812	100nF 50V	
2438	4822 124 81286	47uF 20% 16V	
2439	4822 124 81286	47uF 20% 16V	
2455	2238 586 59812	100nF 50V	
2456	4822 122 33761	22pF 5% 50V	
2457	2020 552 94427	100pF 5% 50V	
2458	2020 552 94427	100pF 5% 50V	
2459	2238 586 59812	100nF 50V	
2460	2238 586 59812	100nF 50V	
2461	3198 028 52290	22uF 20% 50V	
2462	3198 028 52290	22uF 20% 50V	
2463	2238 586 59812	100nF 50V	
2464	2238 586 59812	100nF 50V	
2466	4822 126 14238	2,2nF 50V	
2467	4822 124 12032	4,7uF 20% 50V	
2468	2238 586 59812	100nF 50V	
2471	3198 017 34730	47nF 16V	/22
2473	2238 586 59812	100nF 50V	
2478	2238 586 59812	100nF 50V	
2482	2238 586 59812	100nF 50V	

RESISTORS

3300	4822 116 52231	820R 5% 0,5W	
3301	4822 117 12925	47k 1% 0,063W	
3304	4822 117 12968	820R 5% 0,62W	
3305	4822 117 12968	820R 5% 0,62W	
3306	4822 117 12968	820R 5% 0,62W	
3307	4822 117 12968	820R 5% 0,62W	
3308	4822 117 12968	820R 5% 0,62W	
3309	4822 117 12968	820R 5% 0,62W	
3310	4822 117 12968	820R 5% 0,62W	
3311	4822 117 12968	820R 5% 0,62W	
3312	4822 117 12968	820R 5% 0,62W	
3313	4822 117 12968	820R 5% 0,62W	
3314	4822 117 12968	820R 5% 0,62W	
3315	4822 117 12968	820R 5% 0,62W	
3316	4822 051 30103	10k 5% 0,062W	
3317	4822 051 30103	10k 5% 0,062W	
3318	4822 051 30272	2k7 5% 0,062W	
3319	4822 051 30221	220R 5% 0,062W	
3320	4822 051 30271	270R 5% 0,062W	
3321	4822 051 30391	390R 5% 0,062W	
3322	4822 051 30561	560R 5% 0,062W	
3323	4822 051 30272	2k7 5% 0,062W	
3324	4822 051 30151	150R 5% 0,062W	
3325	4822 051 30221	220R 5% 0,062W	
3326	4822 116 83876	270R 5% 0,5W	
3328	4822 117 12968	820R 5% 0,62W	
3329	4822 051 30391	390R 5% 0,062W	
3330	4822 116 52226	560R 5% 0,5W	
3331	4822 116 52231	820R 5% 0,5W	
3332	4822 116 52207	1k2 5% 0,5W	
3334	4822 116 52283	4k7 5% 0,5W	
3335	4822 051 30272	2k7 5% 0,062W	
3336	4822 051 30151	150R 5% 0,062W	
3337	4822 051 30221	220R 5% 0,062W	
3338	4822 116 83876	270R 5% 0,5W	
3339	4822 051 30391	390R 5% 0,062W	
3340	4822 051 30561	560R 5% 0,062W	
3341	4822 117 12968	820R 5% 0,62W	
3342	4822 117 11817	1k2 1% 1/16W	
3343	4822 117 12903	1k8 1% 0,063W	
3344	4822 051 30272	2k7 5% 0,062W	
3345	4822 051 30151	150R 5% 0,062W	
3350	4822 117 11817	1k2 1% 1/16W	
3351	4822 117 12903	1k8 1% 0,063W	
3352	4822 051 30272	2k7 5% 0,062W	
3353	4822 051 30472	4k7 5% 0,062W	
3354	4822 051 30103	10k 5% 0,062W	
3404	4822 051 30684	680k 5% 0,062W	
3405	4822 051 30474	470k 5% 0,062W	
3406	4822 051 30153	15k 5% 0,062W	
3407	4822 051 30152	1k5 5% 0,062W	/22
3408	4822 051 30103	10k 5% 0,062W	/22
3409	4822 051 30222	2k2 5% 0,062W	/22
3410	4822 117 12891	220k 1%	/22
3413	4822 117 13632	100k 1% 0,62W	
3416	4822 051 30102	1k 5% 0,062W	/22
3417	4822 051 30102	1k 5% 0,062W	/22
3418	4822 050 21003	10k 1% 0,6W	/21/21M/37
3419	4822 051 30103	10k 5% 0,062W	/21/21M/37
3420	4822 051 30272	2k7 5% 0,062W	
3421	4822 051 30102	1k 5% 0,062W	
3422	4822 051 30684	680k 5% 0,062W	
3423	4822 116 52249	1k8 5% 0,5W	
3424	4822 117 12891	220k 1%	
3425	4822 051 30682	6k8 5% 0,062W	
3426	4822 051 30102	1k 5% 0,062W	
3427	4822 051 30102	1k 5% 0,062W	
3428	4822 051 30682	6k8 5% 0,062W	
3429	4822 116 83872	220R 5% 0,5W	
3430	4822 052 10688	⚠ 6R8 5% 0,33W	
3431	4822 116 83872	220R 5% 0,5W	
3432	4822 052 10109	⚠ 10R 5% 0,33W	
3433	4822 116 52257	22k 5% 0,5W	
3438	3198 021 32250	2M2 5%	
3440	4822 051 30103	10k 5% 0,062W	
3441	4822 051 30103	10k 5% 0,062W	
3442	4822 051 30103	10k 5% 0,062W	
3443	4822 051 30102	1k 5% 0,062W	
3444	4822 051 30102	1k 5% 0,062W	
3445	4822 051 30102	1k 5% 0,062W	
3447	4822 051 30103	10k 5% 0,062W	
3448	4822 116 83872	220R 5% 0,5W	
3449	4822 116 83872	220R 5% 0,5W	
3450	4822 051 30471	470R 5% 0,062W	
3451	4822 051 30471	470R 5% 0,062W	
3452	4822 051 30471	470R 5% 0,062W	
3453	4822 116 83883	470R 5% 0,5W	
3454	4822 116 83883	470R 5% 0,5W	
3455	4822 051 30471	470R 5% 0,062W	
3456	4822 051 30471	470R 5% 0,062W	
3457	4822 051 30471	470R 5% 0,062W	
3458	4822 051 30102	1k 5% 0,062W	
3459	4822 051 30102	1k 5% 0,062W	
3460	4822 051 30102	1k 5% 0,062W	
3461	4822 051 30471	470R 5% 0,062W	
3462	4822 051 30102	1k 5% 0,062W	
3463	4822 051 30472	4k7 5% 0,062W	
3464	4822 051 30102	1k 5% 0,062W	
3465	4822 051 30102	1k 5% 0,062W	
3466	4822 116 52175	100R 5% 0,5W	
3467	4822 116 52175	100R 5% 0,5W	
3468	4822 116 52175	100R 5% 0,5W	
3469	4822 116 52175	100R 5% 0,5W	
3470	4822 050 11002	1k 1% 0,4W	
3471	4822 050 11002	1k 1% 0,4W	
3472	4822 051 30102	1k 5% 0,062W	
3473	4822 051 30471	470R 5% 0,062W	
3474	4822 051 30471	470R 5% 0,062W	
3475	4822 051 30471	470R 5% 0,062W	
3476	4822 051 30102	1k 5% 0,062W	
3477	4822 051 30102	1k 5% 0,062W	
3478	4822 051 30102	1k 5% 0,062W	
3479	4822 051 30102	1k 5% 0,062W	
3480	4822 051 30102	1k 5% 0,062W	

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

3481	4822 051 30102	1k 5% 0,062W
3482	4822 050 11002	1k 1% 0,4W
3483	4822 050 11002	1k 1% 0,4W
3484	4822 051 30102	1k 5% 0,062W
3485	4822 051 30102	1k 5% 0,062W
3486	4822 051 30102	1k 5% 0,062W
3487	4822 051 30102	1k 5% 0,062W
3489	4822 051 30102	1k 5% 0,062W
3490	4822 051 30102	1k 5% 0,062W
3491	4822 051 30102	1k 5% 0,062W
3492	4822 051 30102	1k 5% 0,062W
3493	4822 051 30102	1k 5% 0,062W
3494	4822 051 30102	1k 5% 0,062W
3495	4822 051 30102	1k 5% 0,062W
3496	4822 051 30102	1k 5% 0,062W
3497	4822 051 30102	1k 5% 0,062W
3498	4822 051 30102	1k 5% 0,062W
3499	4822 051 30102	1k 5% 0,062W
3500	4822 051 30102	1k 5% 0,062W
3501	4822 051 30102	1k 5% 0,062W
3502	4822 051 30102	1k 5% 0,062W
3503	4822 051 30102	1k 5% 0,062W
3504	4822 051 30102	1k 5% 0,062W
3505	4822 051 30102	1k 5% 0,062W
3506	4822 051 30102	1k 5% 0,062W
3507	4822 051 30102	1k 5% 0,062W
3508	4822 051 30102	1k 5% 0,062W
3509	4822 051 30102	1k 5% 0,062W
3510	4822 051 30102	1k 5% 0,062W
3511	4822 051 30102	1k 5% 0,062W
3512	4822 051 30102	1k 5% 0,062W
3513	4822 051 30102	1k 5% 0,062W
3514	4822 051 30102	1k 5% 0,062W
3515	4822 051 30102	1k 5% 0,062W
3516	4822 051 30102	1k 5% 0,062W
3517	4822 051 30102	1k 5% 0,062W
3518	4822 051 30102	1k 5% 0,062W
3519	4822 051 30102	1k 5% 0,062W
3520	4822 051 30102	1k 5% 0,062W
3521	4822 051 30102	1k 5% 0,062W
3522	4822 051 30102	1k 5% 0,062W
3523	4822 051 30102	1k 5% 0,062W
3524	4822 051 30102	1k 5% 0,062W
3525	4822 051 30102	1k 5% 0,062W
3526	4822 051 30471	470R 5% 0,062W
3527	4822 051 30471	470R 5% 0,062W
3528	4822 051 30103	10k 5% 0,062W
3529	4822 051 30103	10k 5% 0,062W
3530	4822 051 30103	10k 5% 0,062W
3531	4822 051 30103	10k 5% 0,062W
3532	4822 052 10688 ⚠	6R8 5% 0,33W
3533	4822 052 10109 ⚠	10R 5% 0,33W
3536	4822 051 30472	4k7 5% 0,062W
3537	4822 051 30472	4k7 5% 0,062W
3538	4822 116 52175	100R 5% 0,5W
3539	4822 051 30103	10k 5% 0,062W
3540	4822 051 30102	1k 5% 0,062W
3543	4822 051 30102	1k 5% 0,062W
4300	4822 051 30008	0R Jumper 0603
4301	4822 051 30008	0R Jumper 0603
4302	4822 051 30008	0R Jumper 0603
4400	4822 051 30008	0R Jumper 0603
4402	4822 051 30008	0R Jumper 0603
4403	4822 051 30008	0R Jumper 0603
4404	4822 051 30008	0R Jumper 0603
4410	4822 051 30008	0R Jumper 0603
4411	4822 051 30008	0R Jumper 0603
4420	4822 051 30008	0R Jumper 0603
4421	4822 051 30008	0R Jumper 0603
4422	4822 051 30008	0R Jumper 0603
4423	4822 051 30008	0R Jumper 0603
4424	4822 051 30008	0R Jumper 0603
4425	4822 051 30008	0R Jumper 0603
4426	4822 051 30008	0R Jumper 0603
4427	4822 051 30008	0R Jumper 0603
4428	4822 051 30008	0R Jumper 0603
4429	4822 051 30008	0R Jumper 0603
4430	4822 051 30008	0R Jumper 0603
4431	4822 051 30008	0R Jumper 0603
4432	4822 051 30008	0R Jumper 0603
4433	4822 051 30008	0R Jumper 0603
4434	4822 051 30008	0R Jumper 0603
4435	4822 051 30008	0R Jumper 0603
4436	4822 051 30008	0R Jumper 0603
4437	4822 051 30008	0R Jumper 0603
4438	4822 051 30008	0R Jumper 0603
4439	4822 051 30008	0R Jumper 0603
4440	4822 051 30008	0R Jumper 0603
4441	4822 051 30008	0R Jumper 0603
4442	4822 051 30008	0R Jumper 0603
4443	4822 051 30008	0R Jumper 0603
4444	4822 051 30008	0R Jumper 0603
4445	4822 051 30008	0R Jumper 0603
4446	4822 051 30008	0R Jumper 0603
4447	4822 051 30008	0R Jumper 0603
4448	4822 051 30008	0R Jumper 0603
4449	4822 051 30008	0R Jumper 0603
4450	4822 051 30008	0R Jumper 0603
4451	4822 051 30008	0R Jumper 0603
4452	4822 051 30008	0R Jumper 0603
4453	4822 051 30008	0R Jumper 0603
4454	4822 051 30008	0R Jumper 0603

ELECTRICAL PARTS LIST - FRONT BOARD

RESISTORS

4455	4822 051 30008	0R Jumper 0603
4456	4822 051 30008	0R Jumper 0603
4457	4822 051 30008	0R Jumper 0603
4458	4822 051 30008	0R Jumper 0603
4459	4822 051 30008	0R Jumper 0603
4460	4822 051 30008	0R Jumper 0603
4461	4822 051 30008	0R Jumper 0603
4462	4822 051 30008	0R Jumper 0603

COILS & FILTERS

5300	3198 018 52280	Coil 2,2uH 10%
5301	3198 018 52280	Coil 2,2uH 10%
5302	3198 018 52280	Coil 2,2uH 10%
5401	3198 018 54780	Coil 4,7uH 10%
5402	3198 018 54780	Coil 4,7uH 10%
5403	2422 543 01069	RES XTL 32,768kHz
5404	5322 242 73686	RES CER 12MHz
5405	4822 242 11033	RES XTL 4,332MHz /22
5406	3198 018 52280	Coil 2,2uH 10% /22
5407	3198 018 52280	Coil 2,2uH 10%
5408	3198 018 54780	Coil 4,7uH 10%
5409	3198 018 54780	Coil 4,7uH 10%
5410	3198 018 54780	Coil 4,7uH 10%
5411	3198 018 54780	Coil 4,7uH 10%

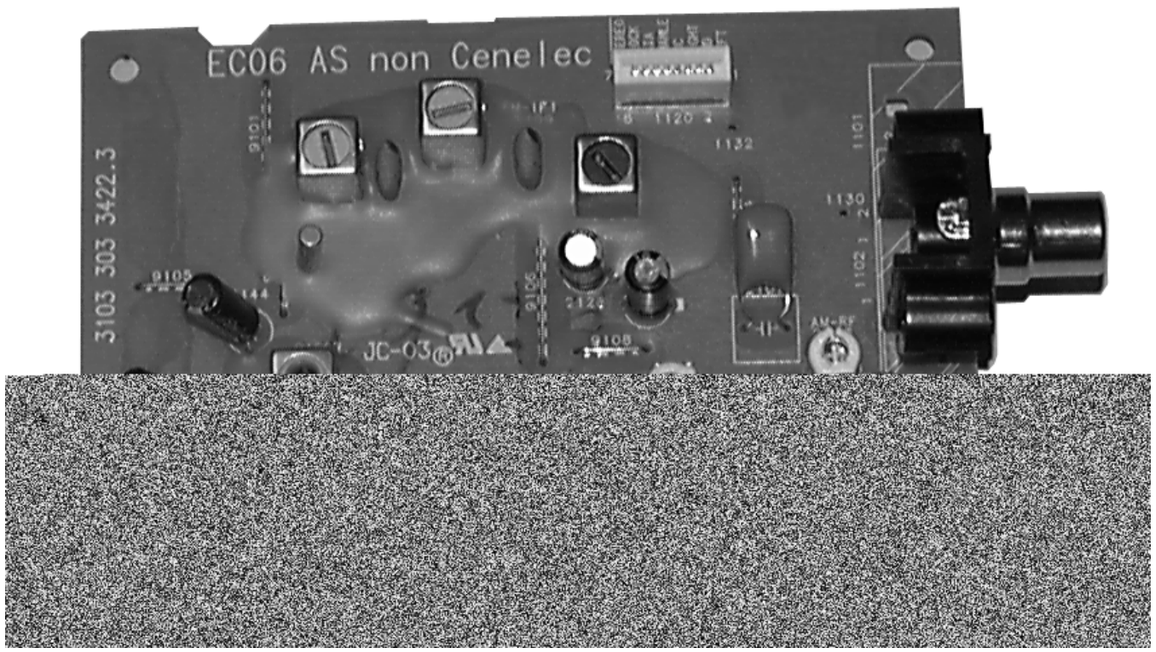
DIODES

6300	4822 130 30621	1N4148
6301	9322 179 76676	LED VS LTL-816EELC
6302	9322 178 15676	LED VS LTL-8166FTNN
6303	9322 178 15676	LED VS LTL-8166FTNN
6304	9322 178 15676	LED VS LTL-8166FTNN
6305	9322 178 15676	LED VS LTL-8166FTNN
6306	9322 178 15676	LED VS LTL-8166FTNN
6307	9322 178 15676	LED VS LTL-8166FTNN
6401	4822 130 30621	1N4148
6403	4822 130 31878	1N4003G
6404	4822 130 34278	BZX79-B6V8
6405	4822 130 31878	1N4003G
6406	4822 130 31878	1N4003G
6407	4822 130 30621	1N4148
6408	4822 130 30621	1N4148
6409	4822 130 30621	1N4148
6410	4822 130 30621	1N4148

TRANSISTORS & INTEGRATED CIRCUITS

7301	9322 185 97667	IR Receiver TSOP4836ZC1
7400	3139 110 53371	TMP88CU74YF - '570S53371'
7401	9322 145 26668	M24C02-WMN6
7403	9352 686 05118	SAA6581T /22
7404	5322 130 60159	BC847B
7405	5322 130 60159	BC847B
7406	4822 130 60373	BC857B
7407	4822 209 15449	74HC4094D

Note : Only the parts mentioned in this list are normal service spare parts.



ECO6 Tuner Board

version: ***SYSTEMS non-CENELEC***

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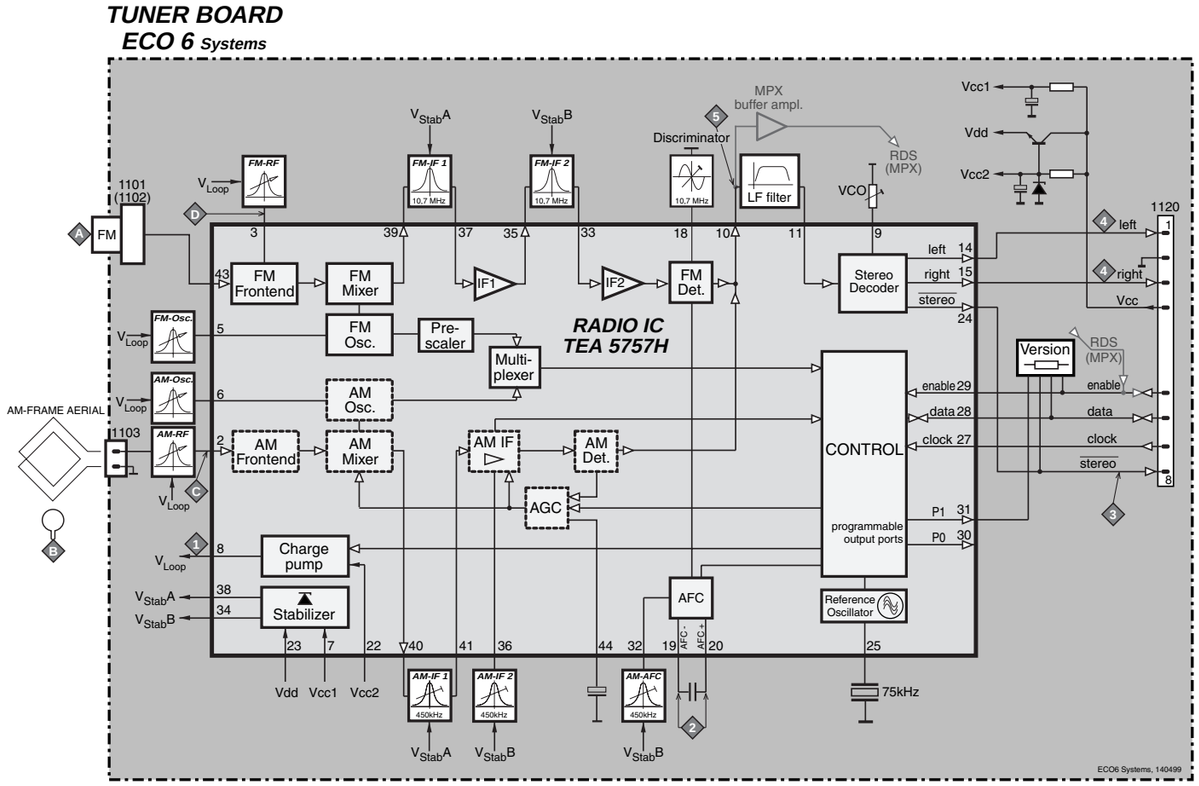
BLOCK DIAGRAM



Electrical Partslist *ECO6* *SYSTEMS NON-CENELEC*

7A-4

MISCELLANEOUS

1101	2422 015 19376	SOCKET 2P CLICKFIT	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR 2 POLE	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2101 ©	4822 126 13692	47pF	1%	63V	
2102 ©	4822 126 13838	100nF	10%	50V	not USA
2103 ©	5322 122 31647	1nF	10%	63V	
2104 ©	5322 122 32531	100pF	5%	50V	
2105 ©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00191	3-11pF TRIMCAP.,N450			
2107	4822 121 51319	1µF	20%	50V	
2120 ©	4822 126 13689	18pF	1%	63V	
2124 ©	5322 122 32654	22nF	10%	63V	
2125 ©	2020 552 96199	560pF	1%	50V	
2126 ©	5322 122 31863	330pF	5%	50V	
2127 ©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130 ©	5322 122 32654	22nF	10%	63V	
2131 ©	4822 126 13482	470nF	20%	16V	
2132 ©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134 ©	4822 126 13188	15nF	5%	63V	not USA
2134 ©	5322 122 32654	22nF	10%	63V	USA only
2135 ©	4822 126 13188	15nF	5%	63V	not USA
2135 ©	5322 122 32654	22nF	10%	63V	USA only
2136 ©	4822 126 14076	220nF	20%	25V	
2137 ©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139 ©	4822 126 14236	15pF	5%	50V	
2140 ©	4822 126 13695	82pF	1%	63V	
2141 ©	4822 126 13838	100nF	10%	50V	
2143 ©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145 ©	4822 122 33575	220pF	5%	50V	
2146 ©	4822 122 33575	220pF	5%	50V	
2147 ©	4822 122 33575	220pF	5%	50V	
2148 ©	4822 122 33127	2,2nF	10%	63V	
2149 ©	5322 122 32659	33pF	5%	50V	RDS only
2150 ©	4822 126 13838	100nF	10%	50V	
2152 ©	4822 126 12105	33nF	5%	63V	not for East Europe
2152 ©	5322 116 80853	560pF	5%	63V	for East Europe only
2153 ©	4822 126 13486	15pF	2%	63V	not for East Europe
2153 ©	4822 122 33926	12pF	2%	50V	for East Europe only
2155	2020 800 00191	3-11pF TRIMCAP.,N450			
2159 ©	5322 122 32659	33pF	5%	50V	
2164 ©	4822 126 13482	470nF	20%	16V	
2165 ©	4822 126 13838	100nF	10%	50V	
2166 ©	5322 122 31647	1nF	10%	63V	
2167 ©	4822 122 33926	12pF	5%	50V	
2169 ©	4822 122 33127	2,2nF	10%	63V	RDS only

RESISTORS

3101 ©	4822 051 20333	33kΩ	5%	0,1W	
3102 ©	4822 117 10837	100kΩ	1%	0,1W	
3103 ©	4822 051 20822	8,2kΩ	5%	0,1W	
3104 ©	4822 117 13577	330Ω	1%	0,1W	
3105 ©	4822 117 11503	220Ω	5%	0,1W	
3132 ©	4822 051 20479	47Ω	5%	0,1W	
3134 ©	4822 051 20223	22kΩ	5%	0,1W	
3141 ©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			

RESISTORS

3143 ©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144 ©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145©	4822 117 11449	2,2kΩ	1%	0,1W	
3146 ©	4822 051 20229	22Ω	5%	0,1W	
3152 ©	4822 051 20471	470Ω	5%	0,1W	
3153 ©	4822 051 20471	470Ω	5%	0,1W	
3154 ©	4822 117 13577	330Ω	1%	0,1W	
3155 ©	4822 117 11503	220Ω	5%	0,1W	
3156 ©	4822 117 10837	100kΩ	1%	0,1W	
3157 ©	4822 117 10837	100kΩ	1%	0,1W	
3158 ©	4822 051 20471	470Ω	5%	0,1W	
3159 ©	4822 051 20471	470Ω	5%	0,1W	
3160 ©	4822 051 20471	470Ω	5%	0,1W	
3161 ©	4822 051 20223	22kΩ	5%	0,1W	
3167 ©	4822 051 20121	120Ω	5%	0,1W	
3168 ©	4822 051 20121	120Ω	5%	0,1W	
3169 ©	4822 051 20154	150kΩ	5%	0,1W	
3170 ©	4822 117 10837	100kΩ	1%	0,1W	
3172 ©	4822 051 20562	5,6kΩ	5%	0,1W	
3176 ©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3181 ©	4822 051 10102	1kΩ	2%	0,25W	
4103 ©	4822 051 20008	CHIP JUMPER 0805			
4106 ©	4822 051 20008	CHIP JUMPER 0805			
4107 ©	4822 051 20008	CHIP JUMPER 0805			
4108 ©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW
5109	4822 242 70665	FM-IF FILTER 10,7MHz
5110	4822 242 70665	FM-IF FILTER 10,7MHz
5111	2422 549 44023	AM-IF FILTER 450kHz
5112	4822 157 70302	AM-IF FILTER 450kHz
5114	4822 157 70302	AM-IF FILTER 450kHz
5119	4822 157 11443	DISCRIMINATOR COIL
5121	4822 242 10261	QUARTZ 75kHz
5123	2422 549 44108	RF-COIL, AM-OSCILLATOR
5130	4822 157 11843	RF COIL 1,5 TURNS
5131	4822 157 11843	RF COIL 1,5 TURNS

DIODES

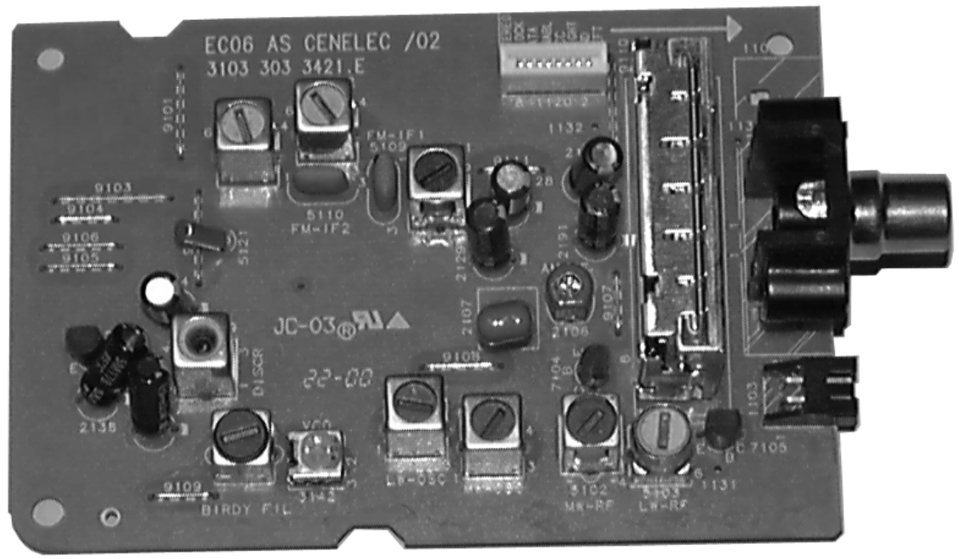
6103 ©	5322 130 34337	BAV99
6105 ©	4822 130 83075	HN1V02H
6106 ©	4822 130 83757	BAS216
6107 ©	9340 386 90115	BZX284-C11
6120 ©	4822 130 83757	BAS216
6130 ©	4822 130 82833	1SV228
6131 ©	4822 130 82833	1SV228

TRANSISTORS

7102	4822 130 42131	BF550	
7103 ©	5322 130 42756	BC857C	RDS only
7111 ©	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	

INTEGRATED CIRCUITS

7101 ©	9351 740 80557	TEA5757H/V1, RADIO IC



ECO6 Tuner Board

version: ***SYSTEMS CENELEC***

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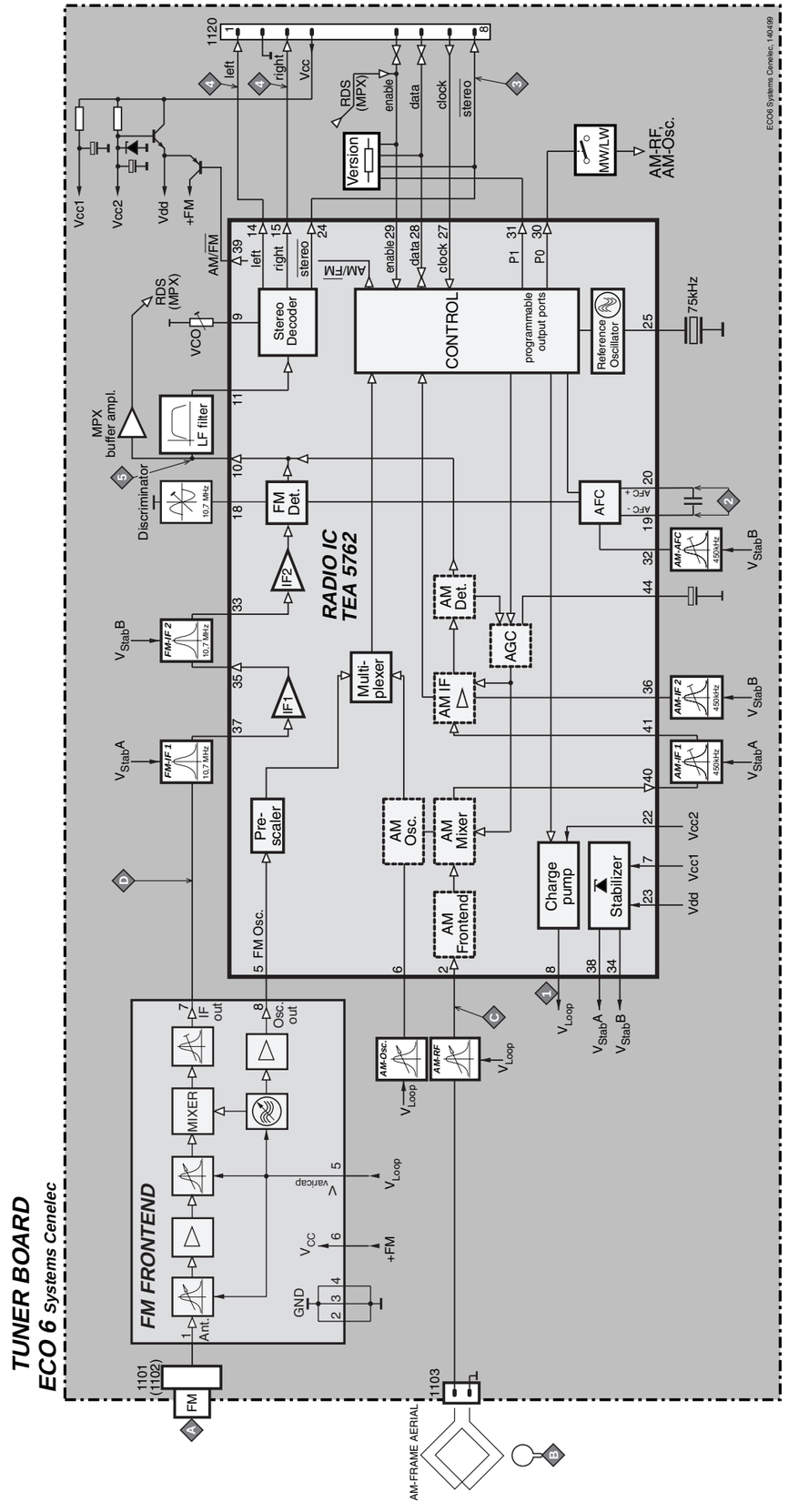
BLOCK DIAGRAM



7B-2

TUNER BOARD ECO6 / SYSTEMS-CENELEC

VERSION PROGRAMMING COMPONENTS

VERSION	6120	3156	3157	3170	7111
/00 /02 FM/MW/LW	⊠				
/00 /02 FM/MW		⊠	⊠	⊠	⊠
/01 FM/MW		⊠	⊠	⊠	⊠
/14 FM-OIRT/MW		⊠	⊠	⊠	⊠
/17 FM/AM		⊠	⊠	⊠	⊠

⊠ component mounted

VERSION DETECTION

P1 6120 BAS216 — 3156 100K — 0.2V — 0V — 7111 BC847C — 3170 100K — 3157 100K

PROGRAMMABLE OUTPUT PORTS

P1 — P0

FM FRONTEND FE450

1110 — 1102 — YKD31-0432 — 1101 USA — YKD21 — 2105 USA 100n — 1130 C-PAD — 1131 C-PAD — T103 — 2102 100n — T102 0V — ANT — GND — VCC — Varicap — MIXER — IF-OUT 0V — OSC OUT 0.1V — 7.2V — 1.6-8V — T107 — 3195 100R +FM — 2191 100u — 2190 100u (p) — 10n — 3194 2K2 — 2180 10n — 3190 120R — 3192 330R — 3193 330R — T104 — 3191 120R

AM-IF1 5111 450kHz — T113 — T115 — 2150 100n

AM-IF2 5112 450kHz — T114

AM-AFC 5114 450kHz

FM-IF1 5109 — **FM-IF2** 5110 — AM/FM 9V

7101 TEA5762

AM DET — RIPPLE — AM-RF — FM-GND — RF-GND1 — FM-OSC — AM-OSC — VCC1 7.8V 8.2V — I-TUNE 1.6-8V 1-8V — VCO 1V 1.3V — AF-OUT 0.7V 10 — MPX-IN 1.2V — AGC — AM-IF — RF-GND2 — AM-IF1-IN — AM-MIXOUT — AM-FM — VSTABA — FM-IF1-IN — AM-IF2 — FM-IF2 — VSTABB — FM-IF2-IN 1.2V 0.7V 33 — AM-AFC 32 1.4V — P1 31 7.5V — P0 30 7.5V 0.1V — WRITE-EN 29 0V — DATA 28 0V — CLOCK 27 0V — DIG-GND 26 — XTAL OSC 25 1.4V — MONO/STEREO 24 stereo 0.2V mono 4.8V — VDD 23 8.2V 8.3V 7.5V — VCC2 — LPF — MUTE — LEFT — RIGHT — PILOT — FILTER — IF-GND — FM-DEMOD — AFC- — AFC+ — FIELDSTR-IND — 0.6V 0.15V — 1V 0V — 1.1V — 2V — 11V

2128 10u — 2165 100n — 2129 100u — 2101 100n (p) — 2161 (p) — 2163 LW — 2148 2n2 — 2147 220p — 2146 220p

AM AMPLIFIER — AM FRONTEND — AM MIXER — AM OSC — AM IF — AM DET — FM IF1 — FM IF2 — FM DET — AFC — AGC — AGC CONTROL — CONTROL — CHARGE PUMP — STABILIZER — PRE-SCALER — MULTI-PLEXER — STEREO DECODER

VCO 3142 — 3141 56K — 100K

2127 220n — 3135 1K — 1.2V

FM-IF2 CONTROL

3169 150K — 2166 1n — 2167 12p — 5121 DT-381 75 kHz

3161 22K — 3160 470R — 3159 470R — 3158 470R — 2145 220p

5V 152kHz, 50mVpp 0V stereo mono stereo — 3 — stereo 0.4V mono 4.8V

T123 STEREO — T122 CLOCK 0V — T121 DATA 0V — T120 ENABLE/MPX 0V — T127 VCC — T126 RIGHT — T125 GND — 1120 — LEFT — FE-BT-VK-N — to/from — 4

from 2169 MPX — 12Vtyp (10-14V)

AM FRAME AERIAL — 1103 XH-S — T105 — T106 — 4101* 0R — 5102 — MW — 7KL — 3106 115 20p LW — 4102* 0R — A — B

MW/LW-RF — 6105-1 HN1V02H — 2107 1u — T111 — 1

LW only — 3108 2K2 — 7104 BC337-40 — P01 LW =HIGH — 6106 BAS216 — T110 — 2159 33p — T109 — 3105 220R — C

AM-OSCILLATOR — 6105 HN1V02H — 6105-2 HN1V02H — 5123 MW — 5122 LW — 3132 47R — 2120 18p 22p LW — 2118 (p) — 2125 560p — 3134 22K — 4104* 0R — 2123 390p — 2124* 10n — 2122 3n3

BIRDY FILTER — 5115 — T112 — 5 — 2131 470n — 3145 2K2 — 2132 470n — 2133 1u — 2138 2u2 — 3130 820R — 3131 820R — 2134 15n 22n USA — 2135 15n 22n USA — 2139 15p — 5118 10nH — 2140 82p — 5119 — DISCRIMINATOR

RDS only — VCC1 — 3143 22K — 3144 1K — 1.3V — 2169 MPX 2n2 to 1120 pin 5 — 3176 33K — 0.7V — BC857C 7103 — 2149 33p — MPX BUFFER AMPLIFIER

LW only — 7105 BC337-40 — 0.7V 0.1V — 3109 4K7 — MW=HIGH — P0 — 5103 LW — 2109 10p — 2108 100p

P01 — P0 — 3125 10K — 8V 6.7V — LW=HIGH — 7122 BC847C — 0V 0.7V — 3128 2K2 — 7.4V — 3180 10K — 3123 4K7 — VDD — 8.3V 7.5V — BC857B 7109

0V — 7124 BC847C — 0.7V 0.1V — 3137 22K — P0 MW=HIGH

VCC1 — 7.8V 8.2V — T140 — 3168 120R — 3167 120R — 2130 22n — 11V — VCC2 — T117 — 3154 330R — 1132 C-PAD

12V — 7112 BC547C — 9.6V — 3172 5K6 — 6107 BZX284-C11 — 3171 47K — 2143 220n — 3146 22R — 3153 470R — 3152 470R — 2137 220n — 2136 220n — T124

VDD — 8.2V 8.3V 7.5V — T118 — 3155 150R — 2144 1u — 8.9V — +FM — 7110 BC857B — 68K — 3151 33K — 2162 — 8.2V — 3150 10K — AM/FM from 7101/39

T116 — 2141 100n — 470n 2164 — 2 — T141 — T142

T112 — 5 — 3 2 1

T102 0V — 2102 100n — 1131 C-PAD — T103

T104 — D

T109 — C

T111 — 1

T112 — 5

T116 — 2

T117 — 3

T118 — 3

T123 — 4

T124 — 4

T125 — 4

T126 — 4

T127 — 4

T140 — 3

T141 — 2

T142 — 2

T105 — 1

T106 — 1

T107 — 3

T109 — C

T110 — 2

T111 — 1

T112 — 5

T113 — 2

T114 — 2

T115 — 1

T116 — 2

T117 — 3

T118 — 3

T120 — 4

T121 — 4

T122 — 4

T123 — 4

T124 — 4

T125 — 4

T126 — 4

T127 — 4

T140 — 3

T141 — 2

T142 — 2

* marked components not for LW version

ECO6 Sys-Cenelec, 010517

LEGEND

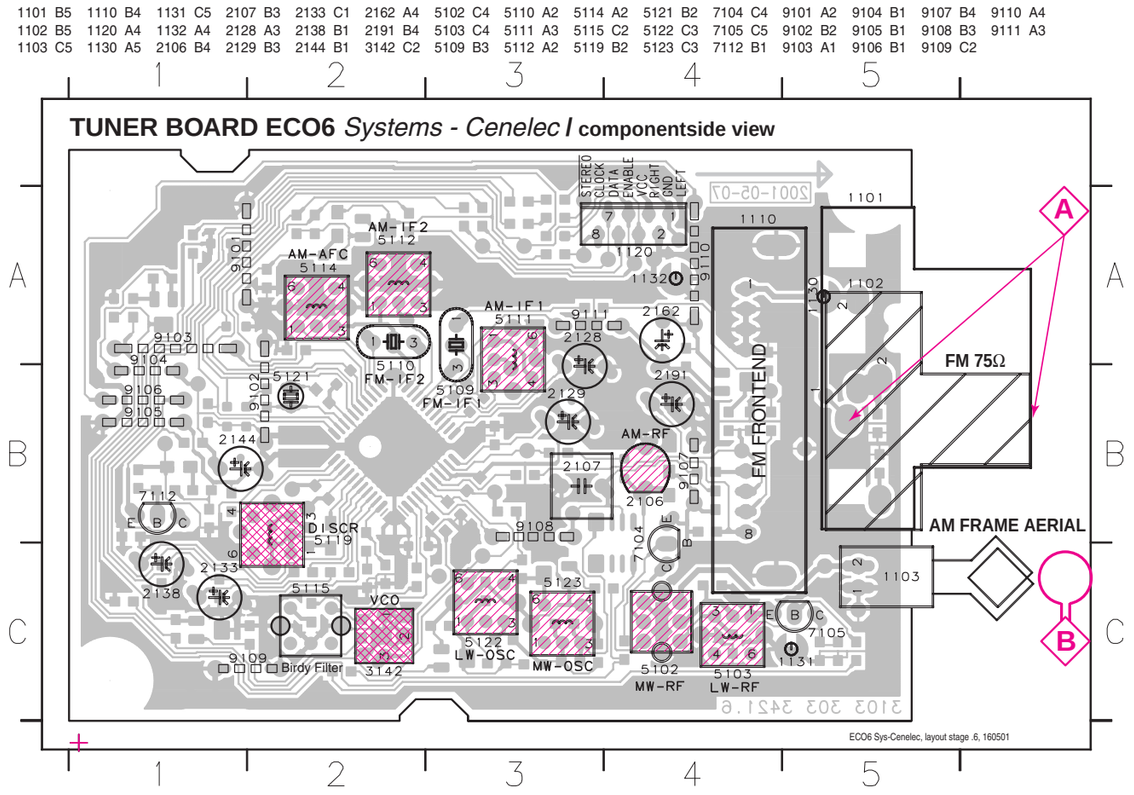
* ... only assembled in FM/AM-version
(p)...for provision only
USA ... for USA version only
LW ... for LW version only

SMD jumper 41xx 0R

EVM — ...V FM mode stereo — ...V MW mode — ...V LW mode
voltages measured while set is tuned to a strong transmitter

Signal path
FM
AM
MPX (Audio Frequency)
AF - left/right

1101	A2	5121	E11
1102	B1	5122	H5
1103	E2	5123	G5
1110	B2	6105-1	E4
1120	E14	6105-2	G6
1130	A2	6106	D4
1131	C2	6107	G13
1132	F13	6120	C13
2102	B1	7101	C8
2105	A2	7103	H8
2106	E3	7104	D2
2107	E4	7105	F4
2108	G3	7109	H3
2109	G3	7110	H12
2118	H6	7111	C13
2119	H6	7112	G12
2120	H6	7122	H4
2122	I6	7124	H7
2123	H6	T102	B2
2124	H6	T103	B2
2125	H6	T104	B6
2127	E7	T105	E2
2128	B8	T106	E2
2129	C7	T107	C3
2130	F11	T109	D5
2131	F8	T110	D5
2132	F8	T111	E5
2133	F8	T112	F7
2134	I8	T113	A9
2135	I9	T114	B11
2136	H14	T116	F10
2137	H13	T117	F13
2138	F9	T118	G11
2139	G9	T120	F13
2140	G9	T121	F13
2141	F10	T122	E13
2143	G12	T123	E13
2144	G11	T124	G14
2145	E11	T125	F14
2146	E12	T126	F13
2147	E12	T127	F13
2148	E12	T140	F11
2149	H7	T141	F10
2150	A10	T142	F10
2159	D5		
2161	C11		
2162	H12		
2163	D11		
2164	G10		
2165	C7		
2166	E11		
2167	E11		
2169	G8		
2180	C4		
2190	C3		
2191	C3		
3105	D5		
3108	D2		
3109	G4		
3123	H3		
3125	H2		
3128	H3		
3130	I9		
3131	I9		
3132	G4		
3134	H6		
3135	E7		
3137	H7		
3141	E7		
3142	E6		
3143	G7		
3144	G8		
3145	F8		
3146	G13		
3150	H12		
3151	H12		
3152	G14		
3153	G13		
3154	F13		
3155	G12		
3156	C12		
3157	D12		
3158	E13		
3159	D13		
3160	D13		
3161	D13		
3167	F12		
3168	F11		
3169	E11		
3170	D12		
3171	G12		
3172	G12		
3176	H7		
3180	I3		
3190	B6		
3191	B7		
3192	B6		
3193	B4		
3194	C4		
3195	C3		
4101	E2		
4102	F3		
4104	H5		
5102	E3		
5103	F2		
5109	B9		
5110	B10		
5111	A9		
5112	A11		
5114	B11		
5115	E7		
5118	G9		
5119	G9		



These assembly drawings show a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

7B-3

TUNER ADJUSTMENT TABLE (**ECO6 Cenelec** FM/MW - and FM/MW/LW - versions with AM-frame aerial)

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check	1	8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123		8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
FM - IF						
FM	10.7MHz, 45mV continuous wave	D	IC 7101 21 shortcircuit to block AFC 2141	5119	2	0mV ±3mV
FM - VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz 1)
FM RF (channel separation)	Note: The FM-frontend unit has already been adjusted by the factory and needs therefore no further adjustments for service purposes.					
FM	98MHz, 1mV 90% Left + 9% pilot mod=1kHz	A	98MHz	IF coil inside FM frontend 1110	4	right channel min.
AM IF						
MW	450kHz connect pin 6 of IC 7101 (AM Osc.) with 3.3kΩ to Vcc	C Δf = ±10kHz V_{RF} = 0.5mV (as low as possible)	IC 7101 36 220R 100nF	5111	5	max. f_o symmetric
			IC 7101 40 220R 100nF see remark 2)	5112		
AM AFC **MW**		C continuous wave V_{RF} = 2mV		5114	2	0mV ±2mV
AM RF 3)						
MW	1494kHz	B Δf = ±30kHz V_{RF} as low as possible	1494kHz	2106	5	max. f_o symmetric
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		

ECO6 Sys Cenelec, 190599

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used! MW has to be aligned before LW.

↕ Repeat

Electrical Partslist *ECO6* SYSTEMS-CENELEC

7B-4

MISCELLANEOUS

1101	2422 015 19376	SOCKET CLICKFIT 2P	USA only
1102	4822 267 10283	SOCKET COAX, IEC 75Ω	not USA
1103	4822 265 31184	JST CONNECTOR, 2 POLE	
1110	2422 542 90071	FM FRONTEND	
1120	4822 265 11515	FFC SOCKET, 8P	

CAPACITORS

2102 ©	4822 126 13838	100nF	10%	50V	not USA
2105 ©	4822 126 13838	100nF	10%	50V	USA only
2106	2020 800 00204	TRIMCAP. 4,2 - 20pF, N750			LW only
2106	2020 800 00191	TRIMCAP. 3 - 11pF, N450			FM/AM only
2107	4822 121 51319	1µF	20%	50V	
2108 ©	5322 122 32531	100pF	5%	50V	LW only
2109 ©	5322 122 32448	10pF	5%	50V	LW only
2120 ©	4822 126 13689	18pF	1%	63V	FM/AM only
2120 ©	5322 122 32658	22pF	5%	50V	LW only
2122 ©	4822 122 33891	3,3nF	10%	63V	LW only
2123 ©	2020 552 93494	390pF	1%	50V	LW only
2124 ©	4822 122 33177	10nF	20%	50V	FM/AM only
2125 ©	2020 552 96199	560pF	1%	50V	
2127 ©	4822 126 14076	220nF	20%	25V	
2128	4822 124 40248	10µF	20%	63V	
2129	4822 124 41584	100µF	20%	10V	
2130 ©	5322 122 32654	22nF	10%	63V	
2131 ©	4822 126 13482	470nF	20%	16V	
2132 ©	4822 126 13482	470nF	20%	16V	
2133	4822 124 21913	1µF	20%	63V	
2134 ©	3198 017 31530	15nF	10%	50V	not USA
2134 ©	5322 122 32654	22nF	10%	63V	USA only
2135 ©	3198 017 31530	15nF	10%	50V	not USA
2135 ©	3198 017 32230	22nF	10%	25V	USA only
2136 ©	4822 126 14076	220nF	20%	25V	
2137 ©	4822 126 14076	220nF	20%	25V	
2138	4822 124 22652	2,2µF	20%	50V	
2139 ©	4822 126 14236	15pF	5%	50V	
2140 ©	4822 126 13695	82pF	1%	63V	
2141 ©	4822 126 13838	100nF	10%	50V	
2143 ©	4822 126 14076	220nF	20%	25V	
2144	4822 124 21913	1µF	20%	63V	
2145 ©	4822 122 33575	220pF	5%	50V	
2146 ©	4822 122 33575	220pF	5%	50V	
2147 ©	4822 122 33575	220pF	5%	50V	
2148 ©	4822 122 33127	2,2nF	10%	63V	
2149 ©	5322 122 32659	33pF	5%	50V	RDS only
2150 ©	4822 126 13838	100nF	10%	50V	
2159 ©	5322 122 31151	22µF	20%	50V	
2163 ©	4822 126 13838	100nF	10%	50V	LW only
2164 ©	4822 126 13482	470nF	20%	16V	
2165 ©	4822 126 13838	100nF	10%	50V	
2166 ©	5322 122 31647	1nF	10%	63V	
2167 ©	4822 122 33926	12pF	5%	50V	
2169 ©	4822 122 33127	2,2nF	10%	63V	RDS only
2180 ©	3198 017 31030	10nF	10%	50V	
2190 ©	4822 126 13838	100nF	10%	50V	
2191	4822 124 40178	100µF	20%	10V	

RESISTORS

3105 ©	4822 117 11503	220Ω	5%	0,1W	
3108 ©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3109 ©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3123 ©	4822 051 20472	4,7kΩ	5%	0,1W	LW only
3125 ©	4822 117 10833	10kΩ	1%	0,1W	LW only

RESISTORS

3128 ©	4822 117 11449	2,2kΩ	1%	0,1W	LW only
3130 ©	3198 021 38210	820Ω	5%	0,06W	
3131 ©	3198 021 38210	820Ω	5%	0,06W	
3132 ©	4822 051 20479	47Ω	5%	0,1W	
3134 ©	4822 051 20223	22kΩ	5%	0,1W	
3135 ©	3198 021 31020	1kΩ	5%	0,06W	
3137 ©	4822 051 20223	22kΩ	5%	0,1W	LW only
3141 ©	4822 117 11148	56kΩ	1%	0,1W	
3142	4822 100 12159	TRIMPOT. 100kΩ			
3143 ©	4822 051 20223	22kΩ	5%	0,1W	RDS only
3144 ©	4822 051 10102	1kΩ	2%	0,25W	RDS only
3145 ©	4822 117 11449	2,2kΩ	1%	0,1W	
3146 ©	4822 051 20229	22Ω	5%	0,1W	
3150 ©	4822 117 10833	10kΩ	1%	0,1W	
3151 ©	4822 051 20683	68kΩ	5%	0,1W	
3152 ©	4822 051 20471	470Ω	5%	0,1W	
3153 ©	4822 051 20471	470Ω	5%	0,1W	
3154 ©	4822 117 13577	330Ω	1%	0,1W	
3155 ©	4822 117 10353	150Ω	5%	0,1W	
3156 ©	4822 117 10837	100kΩ	1%	0,1W	
3157 ©	4822 117 10837	100kΩ	1%	0,1W	
3158 ©	4822 051 20471	470Ω	5%	0,1W	
3159 ©	4822 051 20471	470Ω	5%	0,1W	
3160 ©	4822 051 20471	470Ω	5%	0,1W	
3161 ©	4822 051 20223	22kΩ	5%	0,1W	
3167 ©	4822 051 20121	120Ω	5%	0,1W	
3168 ©	4822 051 20121	120Ω	5%	0,1W	
3169 ©	4822 051 20154	150kΩ	5%	0,1W	
3170 ©	4822 117 10837	100kΩ	1%	0,1W	
3171 ©	4822 117 10834	47kΩ	1%	0,1W	
3172 ©	4822 051 20562	5,6kΩ	5%	0,1W	
3176 ©	4822 051 20333	33kΩ	5%	0,1W	RDS only
3180 ©	4822 117 10833	10kΩ	1%	0,1W	LW only
3190 ©	4822 051 20121	120Ω	5%	0,1W	
3191 ©	4822 051 20121	120Ω	5%	0,1W	
3192 ©	4822 117 13577	330Ω	1%	0,1W	
3193 ©	4822 117 13577	330Ω	1%	0,1W	
3194 ©	4822 117 11449	2,2kΩ	1%	0,1W	
3195 ©	4822 051 20101	100Ω	5%	0,1W	
4101 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4102 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4104 ©	4822 051 20008	CHIP JUMPER 0805			FM/AM only
4105 ©	4822 051 20008	CHIP JUMPER 0805			
4106 ©	4822 051 20008	CHIP JUMPER 0805			
4107 ©	4822 051 20008	CHIP JUMPER 0805			

COILS

5102	4822 157 71634	RF-COIL MW	
5103	2422 549 44107	RF-COIL LW	LW only
5109	4822 157 71639	FM-IF FILTER 10,7MHz	
5110	4822 242 70665	FM-IF FILTER 10,7MHz	
5111	2422 549 44023	AM-IF FILTER 450kHz	
5112	4822 157 70302	AM-IF FILTER 450kHz	
5114	4822 157 70302	AM-IF FILTER 450kHz	
5115	4822 157 71636	ANTI BIRDY FILTER	
5118 ©	2422 535 95881	100nH	
5119	4822 157 11443	DISCRIMINATOR COIL	
5121	4822 242 10261	QUARTZ 75kHz	
5122	2422 549 44108	RF-COIL, LW-OSCILLATOR	LW only
5123	2422 549 44108	RF-COIL, MW-OSCILLATOR	

DIODES

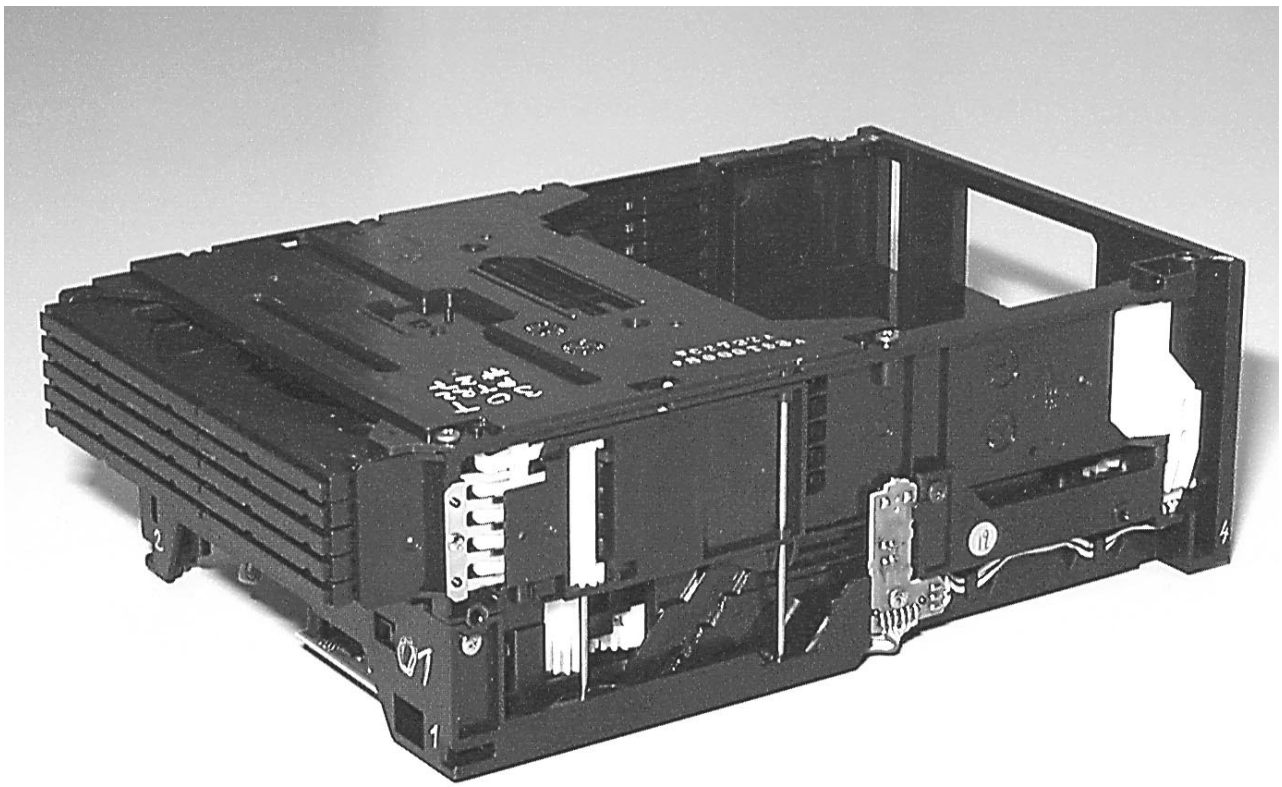
6105 ©	4822 130 83075	HN1V02H	
6106 ©	4822 130 83757	BAS216	
6107 ©	9340 386 90115	BZX284-C11	
6120 ©	4822 130 83757	BAS216	

TRANSISTORS

7103 ©	5322 130 42756	BC857C	RDS only
7104	9322 003 64676	TBC337-40	LW only
7105	9322 003 64676	TBC337-40	LW only
7109 ©	4822 130 60373	BC856B	LW only
7110 ©	4822 130 60373	BC856B	
7111 ©	5322 130 42755	BC847C	
7112	4822 130 44503	BC547C	
7122 ©	5322 130 42755	BC847C	LW only
7124 ©	5322 130 42755	BC847C	LW only

INTEGRATED CIRCUITS

7101	4822 209 90315	TEA5762H/V1, RADIO IC



5DTC Module

(MP3 version)

Layout stage .4

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Service Hints

In case of symptom „skipping tracks“ perform following actions:

1. VERIFY THE COMPLAINT

PLAYABILITY CHECK

Use CDDA SBC 444A: 4822 397 30245
TR 14 (600µ black dot) maximum at 01:15
TR 19 (fingerprint)
TR 10 (1000µ wedge)

Use CD-RW Printed Audio Disk 7104 099 96611
TR 3 (Fingerprint)
TR 8 (600µ black dot) maximum at 01:00

- playback of all these tracks without audible disturbance
- jump forward/backward within a reasonable time

2. CLEAN THE LENS

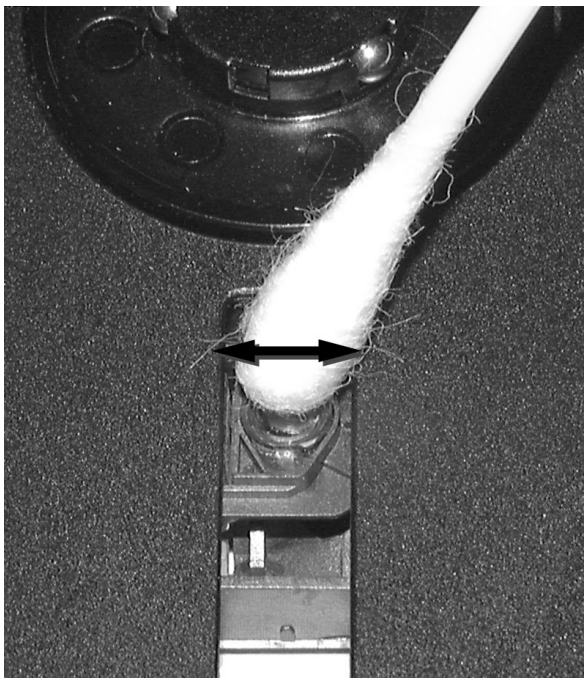
CD DRIVE – LENS CLEANING

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.

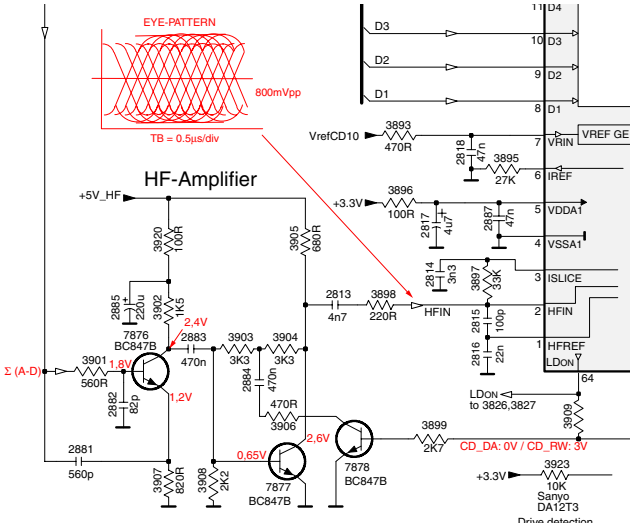
The direction of cleaning must be in the way as indicated in the picture below.



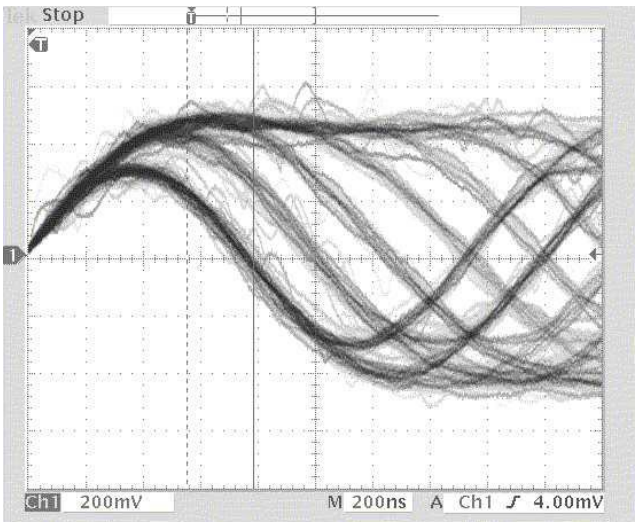
3. MEASURE THE EYE-PATTERN SIGNAL

EYE-PATTERN SIGNAL – JITTER MEASUREMENT

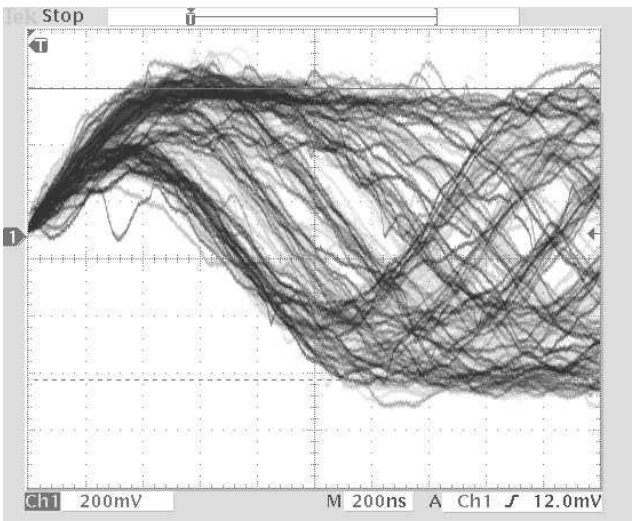
Measure the signal direct on resistor 3898 using an oscilloscope (see also chapter 10-9).



See below examples of the signal. Amplitude should read at least 700mVpp using SBC444A.



good



bad

If the oscilloscope shows a signal like the ‘bad’ one, and/or the amplitude decreases within 1minute - the CD drive has to be replaced.

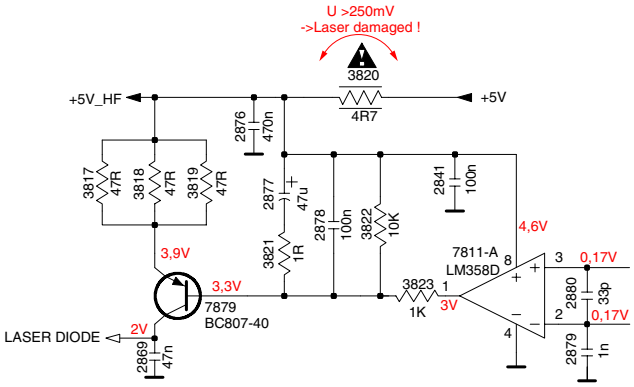
Service Hints

4. MEASURE THE LASER CURRENT

CD DRIVE – LASER CURRENT MEASUREMENT

The laser current can be measured as a voltage drop on resistor 3820. Typical value 170 - 190mV for CD-DA respectively 200 - 220mV for CD-RW.

Laser power control



5. MEASURE THE OFFSETS OF THE CD-DRIVE

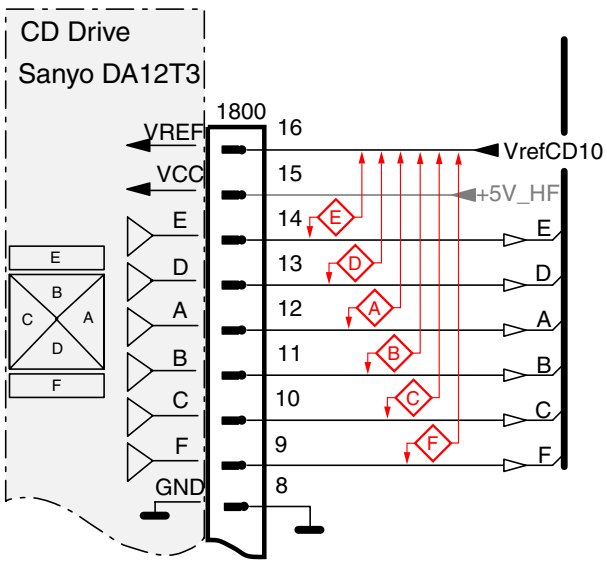
CD DRIVE – OFFSET MEASUREMENT

Each photodiode of the CD-drive may have an offset. This offset has to be compensated by the signal processor. A high offset of the CD-drive leads to poor playability of some CDs (skipping tracks).

Start the **Service Test Program** - section „Focus Test“ without a CD. Focus sensitivity = CD-RW.

Use a DC Millivoltmeter for measurement. The offsets can be measured direct on the connector. See drawing below.

The values from diode A-D should read 0±10mV. Diodes E and F are less critical.



If one of the offsets is higher than ±10mV the CD drive has to be replaced.

6. MEASURE THE OFFSETS OF THE CD10

SIGNAL PROCESSOR – OFFSET MEASUREMENT

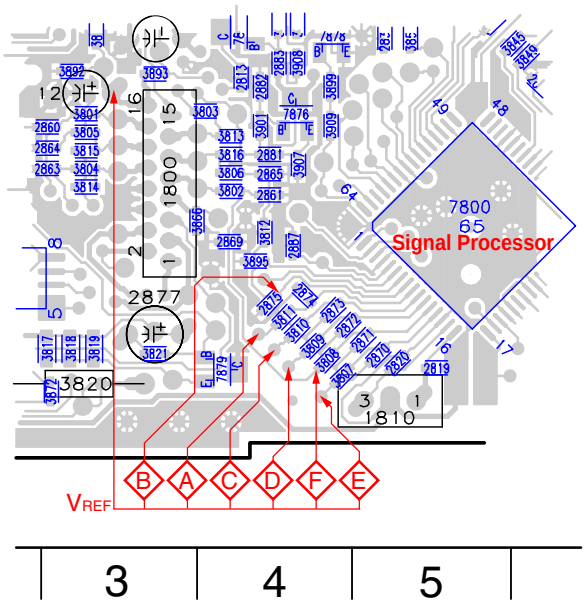
Each ADC input of the CD10 may have an offset too. Also this offset leads (together with the offsets of the CD Drive) to poor playability of some CDs (skipping tracks).

Start the **Service Test Program** - section „Focus Test“ using a CD-RW disc.

Use a DC Millivoltmeter for measurement. The offsets can be measured on capacitors near the signal processor. See drawing below.

The value should read 0mV±10mV.

CD Board side A view



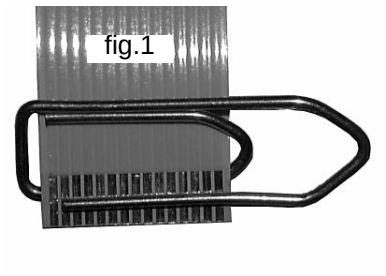
If one of the offsets is higher than ±10mV the signal processor has to be replaced.

If none of the measured offsets is higher than ±10mV - replace the part with the higher value.

WARNING

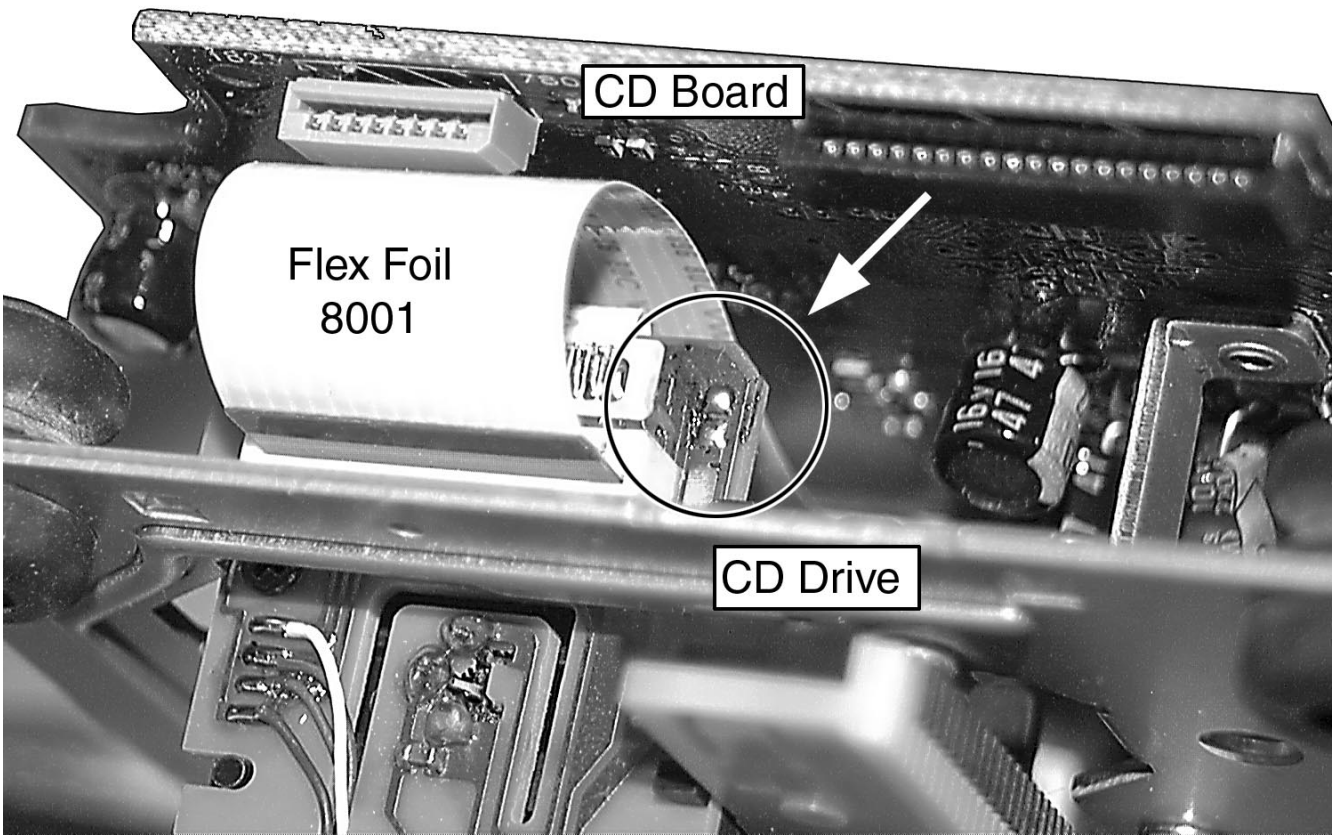
CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CDM MECHANISM. THAT´S WHY, BESIDES THE SAFETY MEASURES LIKE
• SWITCH OFF POWER SUPPLY
• ESD PROTECTION
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The CD drive forms a compact building block with the CD Board.

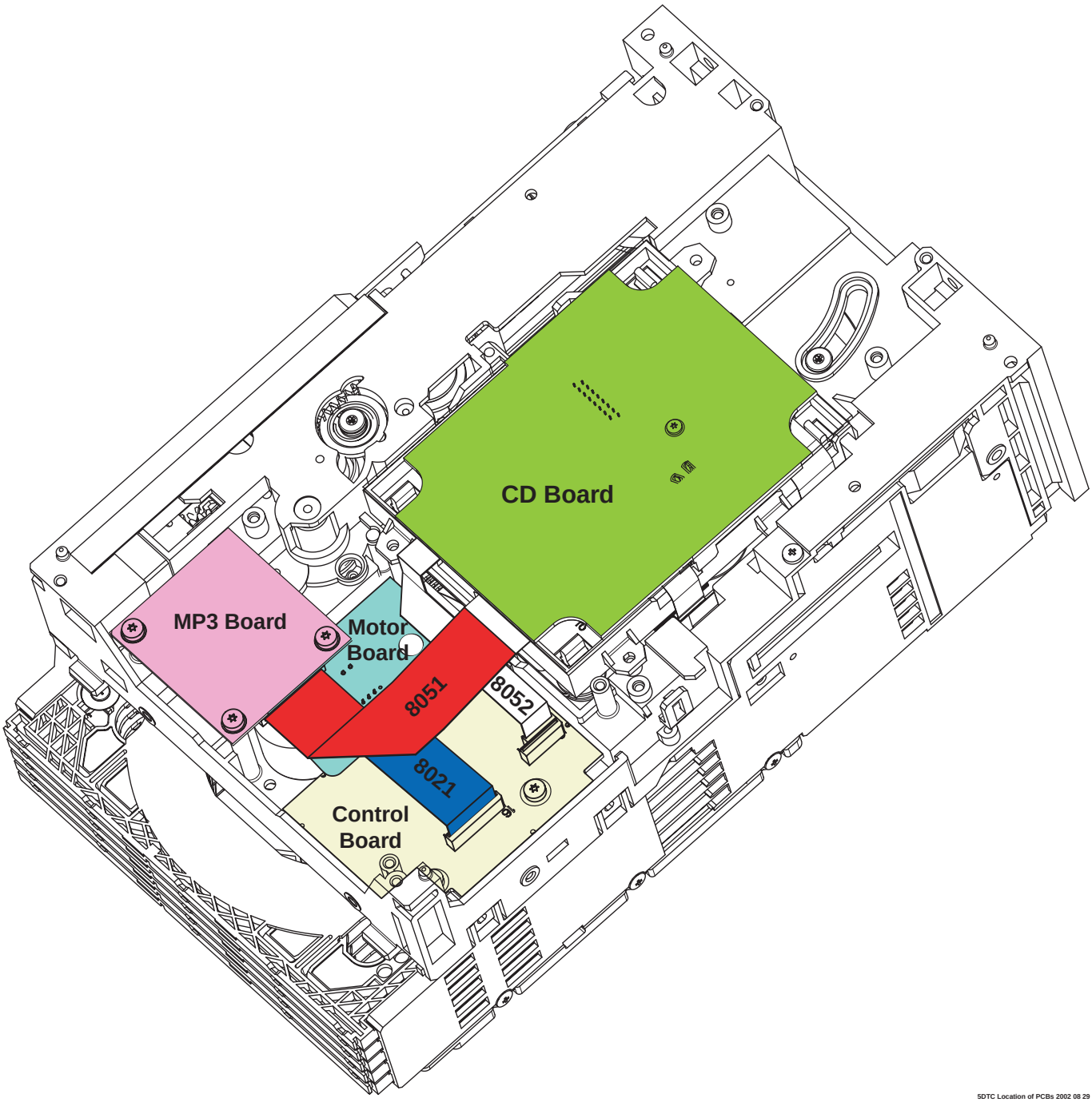


<u>The following steps have to be done when replacing the CD mechanism:</u>
1. Desolder disc and slide motor
2. Loosen 2x screw
1. Disconnect flexfoil from old CD drive
2. Put a paperclip over contacts of flexfoil to short-circuit the contacts (fig.1)
3. Remove old CD drive
4. Mount new CD drive to CD board
5. Solder disc and slide motor **after** fixing the drive to the board
5. Move slide outside
6. Remove paperclip from flexfoil
7. Connect flexfoil to new CD drive
8. Remove ESD-protection (solder joint) from laserunit (see picture below)

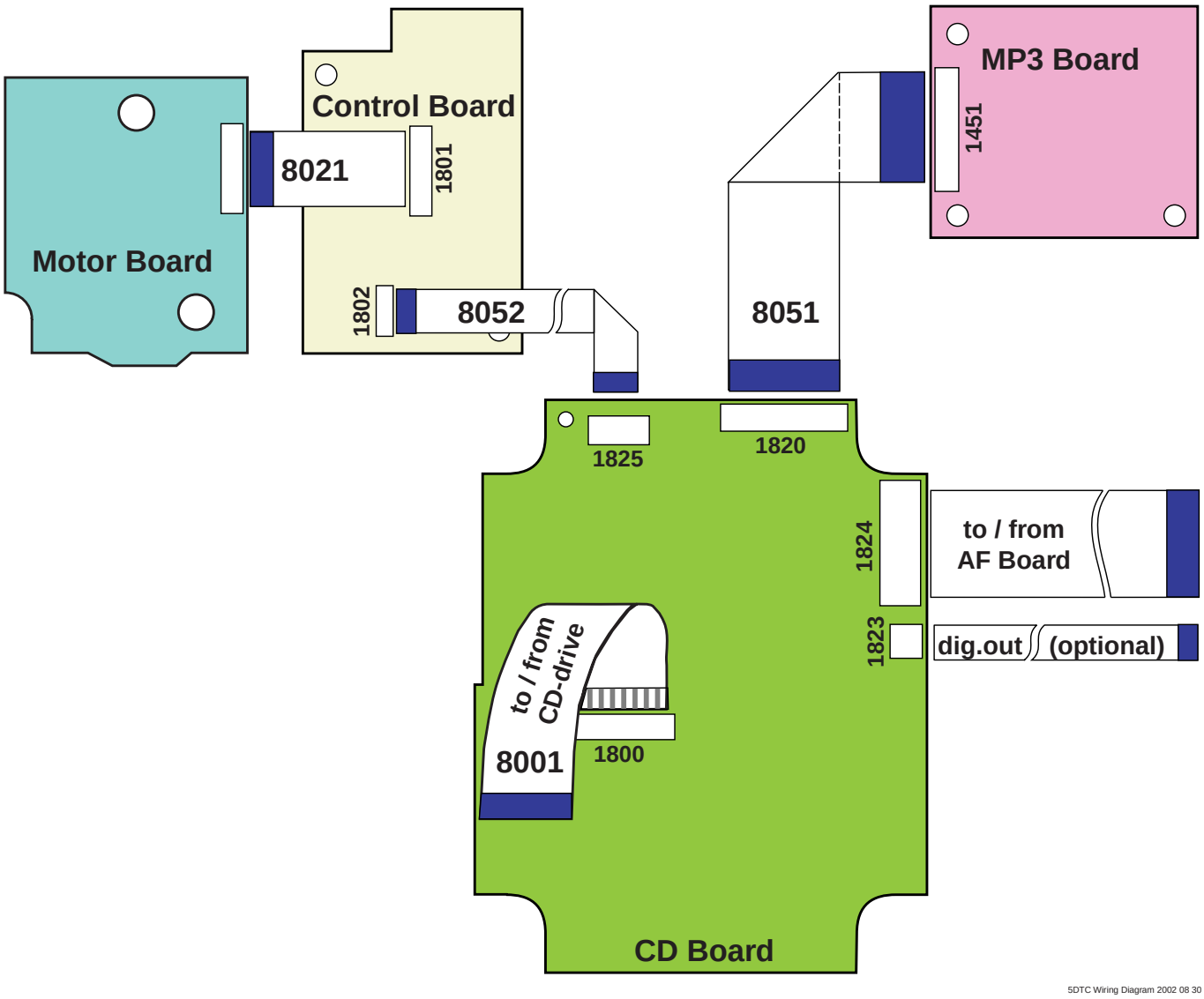
Attention: The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.



Location of Printed Circuit Boards



Wiring Diagram 5DTC Module

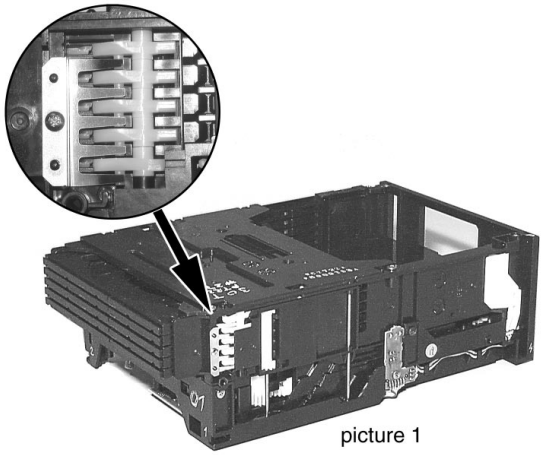


The FFC-Cables are available as sparepart.

8001	3103 308 93090	FFC CABLE 16Pin 80mm BD	Connection from CD Board to CD Drive
8051	3103 308 93100	FFC-CABLE 19Pin 90mm AD	Connection from CD Board to MP3 Board
8052	3103 308 93120	FFC CABLE 8Pin 80mm BD	Connection from CD Board to Control Board
8021	3103 308 93110	FFC-CABLE 16Pin 60mm AD	Connection from Control Board to Motor Board

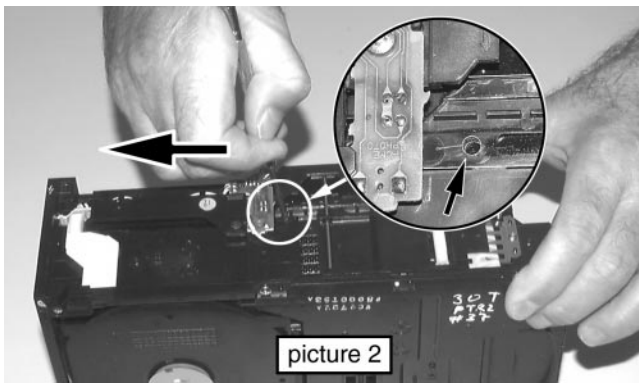
Emergency opening of the trays

The trays of the 5DTC are mechanically locked.

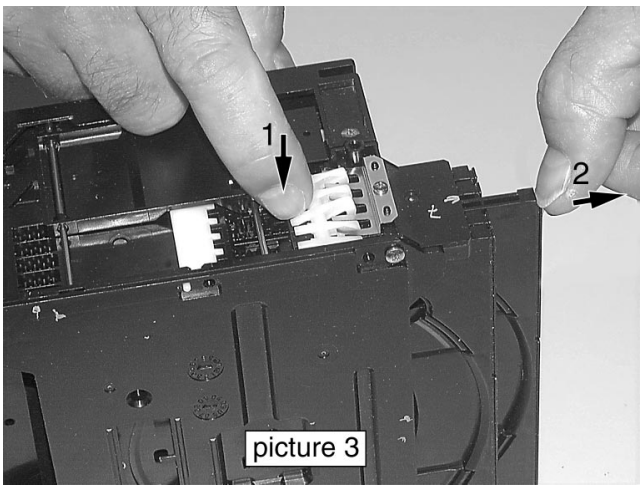


picture 1

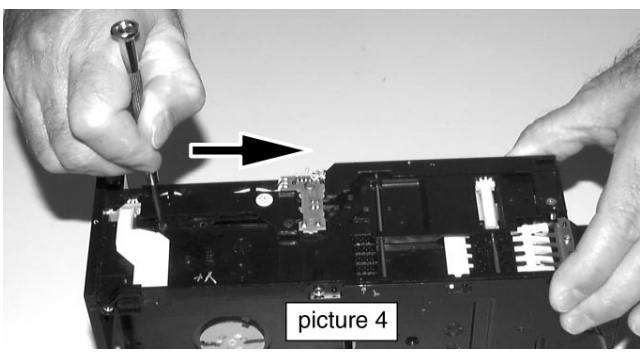
To open tray 1, 2 and 3 move lever (pos 29) backwards (e.g. with a screwdriver - see picture 2) to its endposition.



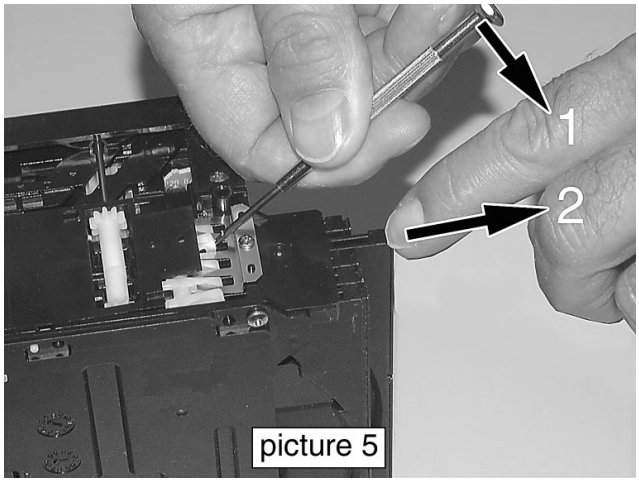
Release the locking mechanism and pull out the tray (see picture 3).



To open tray 4 and 5 move lever (pos 29) forward to its endposition (see picture 4).

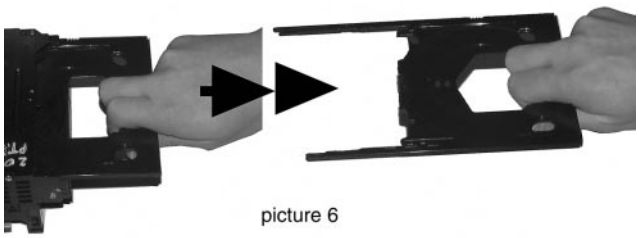


Release snap as shown in picture 5 and pull tray out.



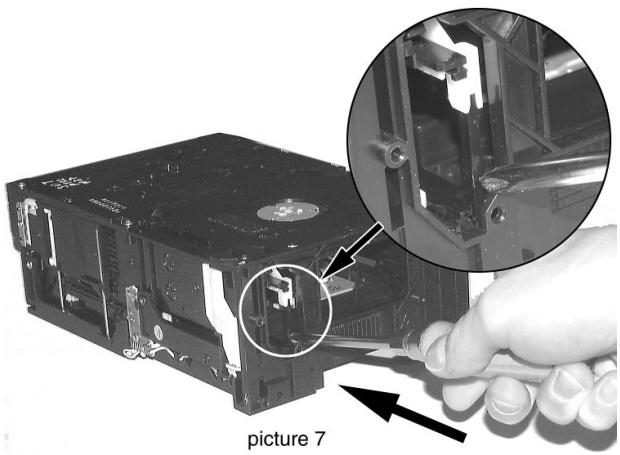
To remove a CD from Play Position perform following steps:

1. Open tray 1 as described before.
2. Tear the tray out with speed (see picture 6). The tray can be inserted aftewards without any alignment.



picture 6

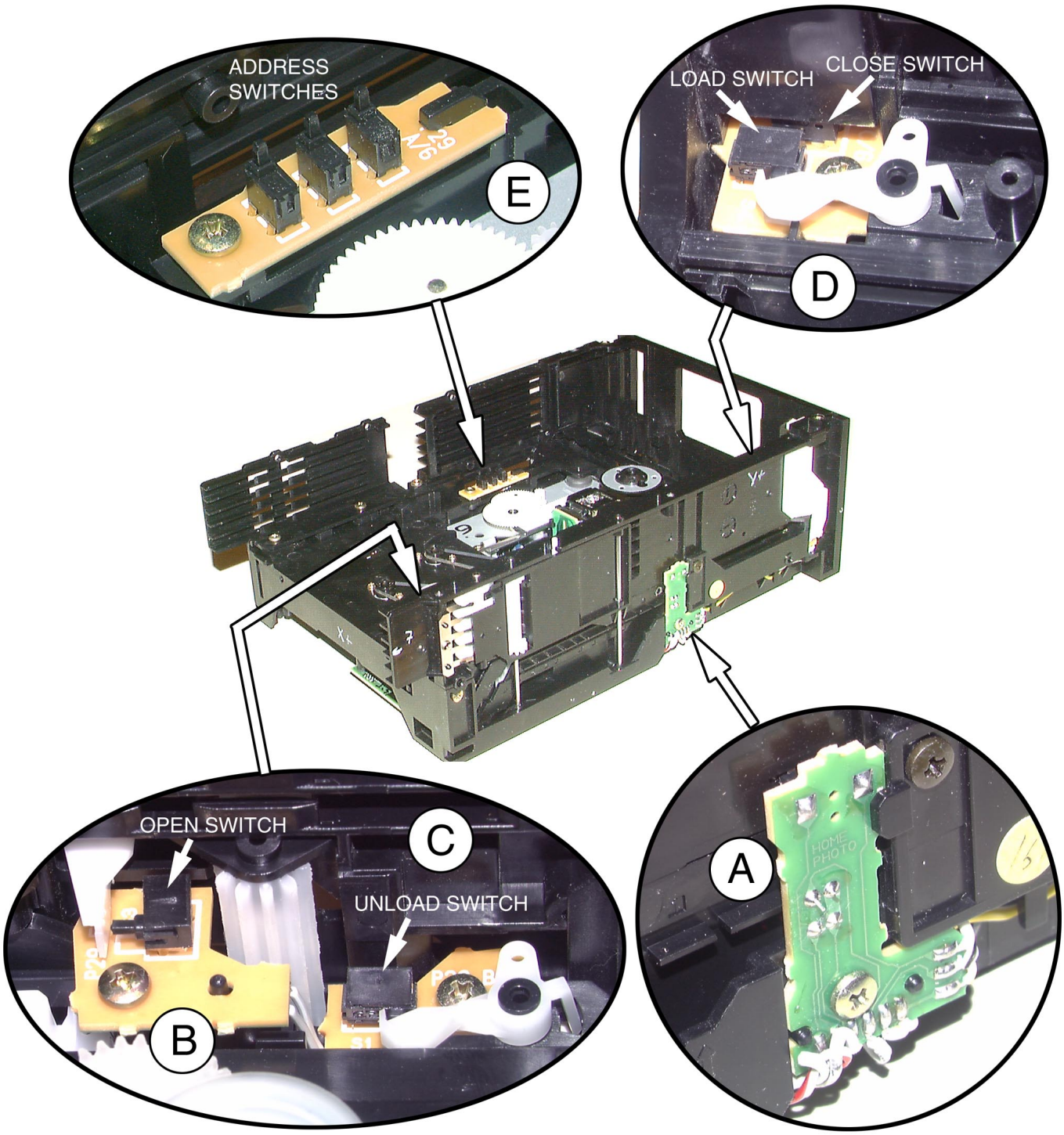
3. Move lever (pos 29) forward to its endposition (see picture 4).
4. Push lever (pos 31) forward (see picture 7).



picture 7

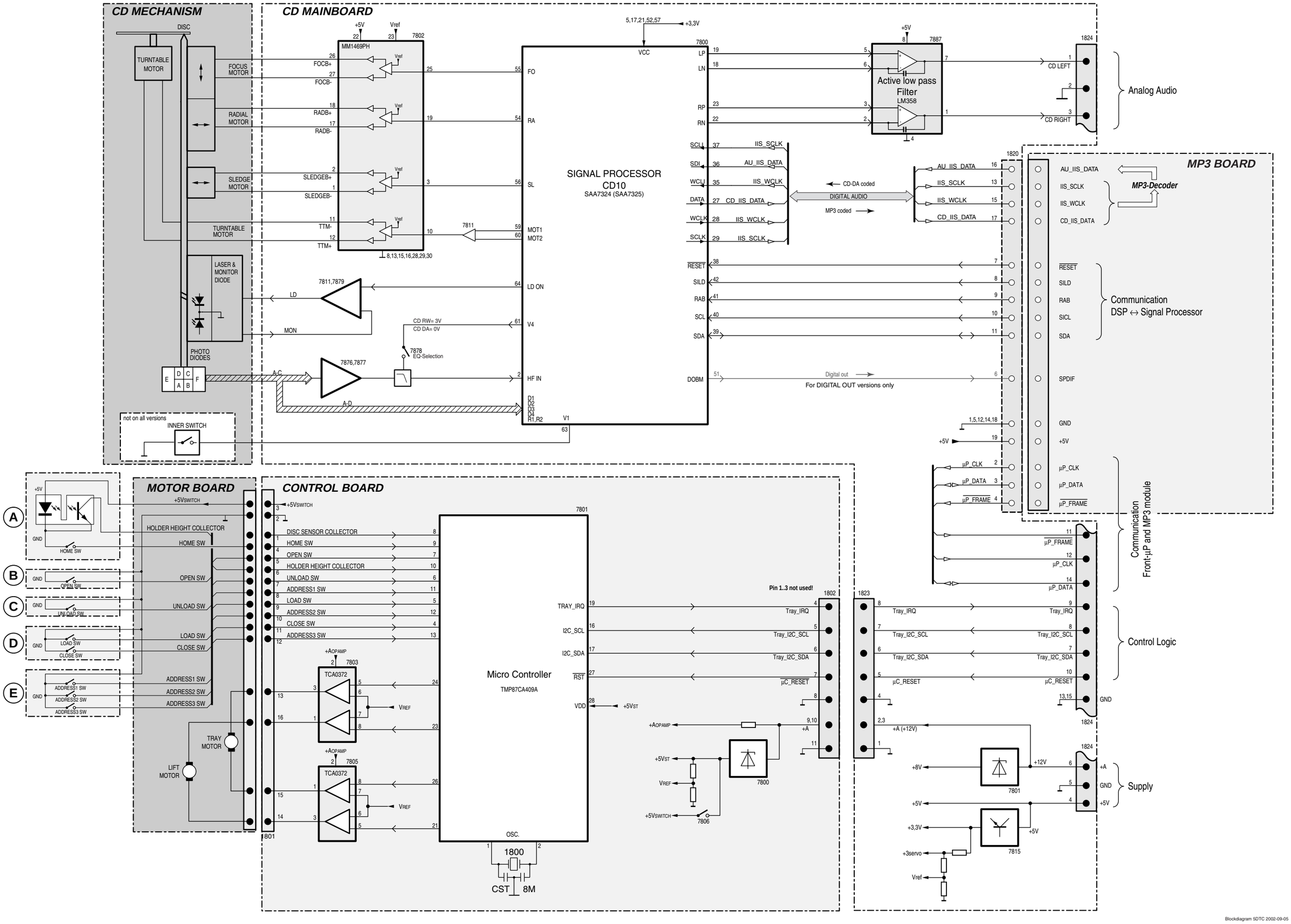
5. Remove CD.

Location of switches



10-9

BLOCK DIAGRAM 5DTC MP3 Version



10-10

5DTC CD BOARD

PHOTODIODES A..F

R2 (CD10) · R1 (CD10) · D4 (CD10) · D3 (CD10) · D2 (CD10) · D1 (CD10)

Laser power control

U >250mV
->Laser damaged !

CD Drive
Sanyo DA12T3

HF-Amplifier

EYE-PATTERN
800mVpp
TB = 0.5µs/div

Active Low Pass

LEFT CHANNEL · RIGHT CHANNEL

7810-B LM358DT · 7810-A LM358DT

Signal Processor

SAA7325
7800

BITSTREAM DAC · INTERFACE SER. DATA · INTERF. VERSAT. · INTERF. LOOPBACK SER. DATA · ADC · PROCESSING PRE- · FUNCTION CONTROL · PROCESSOR AUDIO · VREF GEN. · DEMOD EFM · PLL DIG. · SRAM ADDR · END FRONT · INTERFACE VERSATILE · CONTROL MOTOR · STAGES OUTPUT · CORR. ERROR · DET. PEAK · INTERF. EBU · SUBCODE PROCESSOR · MICROCONTROLLER INTERFACE

Digital MP3 Data · Digital Audio Data · Inner switch detection

For sets with DIGITAL OUT only

CD_DA: 0V / CD_RW: 3V

Mitsumi MCD2

Motor Driver

SLIDE · DISC · FOCUS · TRACK

accelerates disc · brakes disc

During speed up · During brake

ESD sensitive lines!

...V DC voltages measured in *PLAY MODE* with following conditions:
"+A" = 12V
"+5V" = 5V

EVM

to / from MP3 Board

to / from 5DTC Control Board

to / from Audio / Combi Board

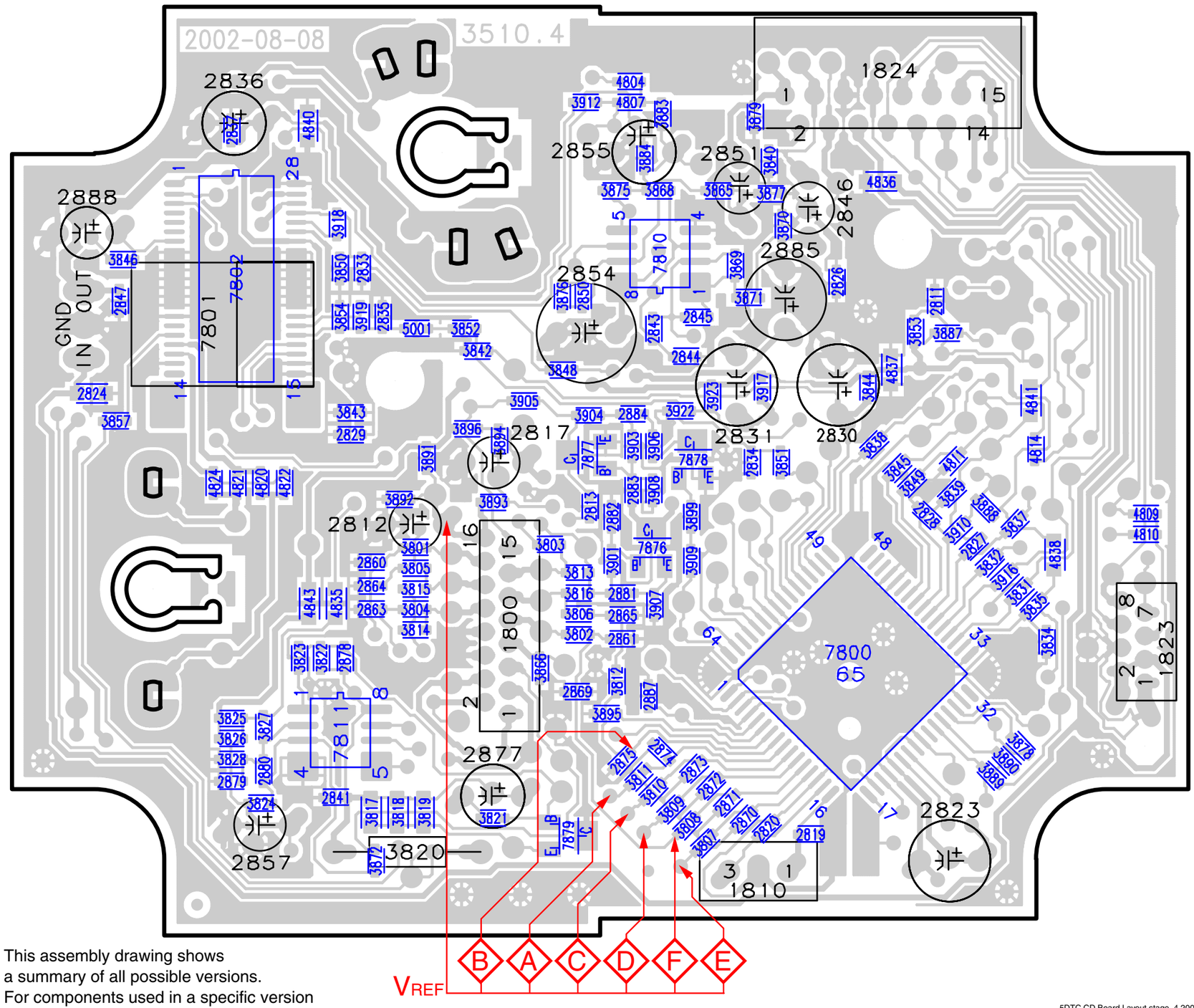
5DTC CD Board MP3 Version 2002 09 18

10-11

Mapping for Circuit Diagram

1800	E1	3827	F5
1810	D9	3828	G5
1820	B15	3829	C10
1823	F15	3831	D14
1824	H15	3832	E14
2187	F9	3833	C9
2812	J10	3834	D13
2813	G8	3835	D13
2814	G9	3836	I6
2815	G9	3837	E14
2816	G9	3838	G13
2817	F9	3839	E14
2818	F9	3840	B14
2819	C9	3841	I6
2820	C9	3842	J9
2821	C9	3843	J9
2822	C10	3844	J10
2823	C10	3845	F14
2824	I12	3846	J1
2825	C11	3847	H5
2826	A15	3848	H5
2827	E13	3849	F14
2828	E13	3850	H4
2829	J9	3851	H5
2830	J10	3852	H5
2831	H11	3854	H4
2832	H5	3855	J4
2833	H4	3856	I5
2834	H5	3859	I6
2836	G3	3860	I6
2837	G3	3861	J6
2838	I4	3862	I5
2839	I5	3864	B11
2840	J4	3865	A14
2841	F4	3866	F2
2843	B12	3867	B11
2844	B12	3868	B12
2845	B13	3869	B13
2846	B14	3870	B14
2847	I11	3871	B14
2848	A12	3872	G2
2849	A11	3873	A11
2850	A13	3874	A11
2851	A14	3875	A12
2852	I5	3876	A13
2853	H4	3877	A14
2853	J11	3878	C12
2854	A12	3879	A14
2855	B11	3880	I12
2860	A6	3881	J12
2861	A6	3883	A12
2863	B6	3884	B12
2864	C6	3888	D14
2865	C6	3889	C12
2866	B6	3890	C13
2869	F2	3891	J10
2870	A7	3892	J10
2871	A7	3893	F8
2872	B7	3895	F9
2873	B7	3896	F8
2874	C7	3897	G9
2875	C7	3898	G8
2876	E3	3899	H8
2877	F3	3901	G6
2878	F3	3902	G7
2879	F5	3903	G7
2880	F5	3904	G8
2881	H6	3905	F8
2882	G6	3906	H8
2884	G7	3907	H7
2885	G6	3908	H7
2886	G11	3909	H9
2893	G7	3910	E14
3801	A6	3911	H13
3802	A6	3912	A11
3803	B6	3917	H11
3804	B6	3918	H4
3805	C6	3919	H4
3806	C6	3920	F7
3807	A7	3922	H10
3808	A7	3923	H9
3809	B7	3925	A11
3810	B7	3926	A11
3811	C7	3927	B11
3812	C7	3928	B11
3813	D6	5001	H5
3814	D6	5002	H11
3815	E6	6877	J11
3816	D14	7800	D11
3816	E6	7801	I11
3817	F2	7802	G2
3818	F2	7810-A	B13
3819	F3	7810-B	A13
3820	E4	7811-A	F4
3821	F3	7811-B	I4
3822	F4	7875	I11
3823	F4	7876	G7
3824	F5	7877	H8
3825	F5	7878	H8
3826	F5	7879	F3

5DTC CD Board Side A



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

5DTC CD Board Layout stage .4 2002-10-01

Mapping for Component Layout

1800	D3	3851	C5
1810	E5	3852	B3
1823	D7	3853	B6
1824	A5	3854	B2
2811	B6	3857	C1
2812	C3	3865	A4
2813	C4	3866	D3
2817	C3	3868	A4
2819	E5	3869	B5
2820	E5	3870	A5
2823	E6	3871	B5
2824	B1	3872	E3
2826	B5	3875	A4
2827	C6	3876	B4
2828	C6	3877	A5
2829	C2	3878	D6
2830	B5	3879	A5
2831	B5	3883	A4
2833	B2	3884	A4
2834	C5	3887	B6
2835	B3	3888	C6
2836	A2	3889	E6
2837	A2	3890	E6
2841	E2	3891	C3
2843	B4	3892	C3
2844	B4	3893	C3
2845	B4	3894	C3
2846	A5	3895	D4
2847	B1	3896	C3
2850	B4	3899	C4
2851	A5	3901	C4
2854	B4	3903	C4
2855	A4	3904	C4
2857	E2	3905	B3
2860	C3	3906	C4
2861	D4	3907	D4
2863	D3	3908	C4
2864	D3	3909	C4
2865	D4	3910	C6
2869	D4	3912	A4
2870	E5	3916	C6
2871	E5	3917	B5
2872	E4	3918	A2
2873	E4	3919	B2
2874	D4	3922	C4
2875	E4	3923	B4
2877	D3	4804	A4
2878	D2	4807	A4
2879	E2	4809	C7
2880	E2	4810	C7
2881	D4	4811	C6
2882	C4	4814	C6
2883	C4	4820	C2
2884	C4	4821	C2
2885	B5	4822	C2
2887	D4	4824	C2
2888	A1	4835	D2
3801	C3	4836	A5
3802	D4	4837	B5
3803	C4	4838	C6
3804	D3	4840	A2
3805	C3	4841	B6
3806	D4	4843	D2
3807	E4	5001	B3
3808	E4	7800	C6
3809	E4	7801	B2
3810	E4	7802	B2
3811	E4	7810	B4
3812	D4	7811	D2
3813	C4	7876	C4
3814	D3	7877	C4
3815	D3	7878	C4
3816	D4	7879	E4
3817	E3		
3818	E3		
3819	E3		
3820	E3		
3821	E3		
3822	D2		
3823	D2		
3824	E2		
3825	D2		
3826	D2		
3827	D2		
3828	D2		
3831	D6		
3832	C6		
3834	D6		
3835	D6		
3837	C6		
3838	C5		
3839	C6		
3840	A5		
3842	B3		
3843	C2		
3844	B5		
3845	C6		
3846	B1		
3848	B4		
3849	C6		
3850	B2		

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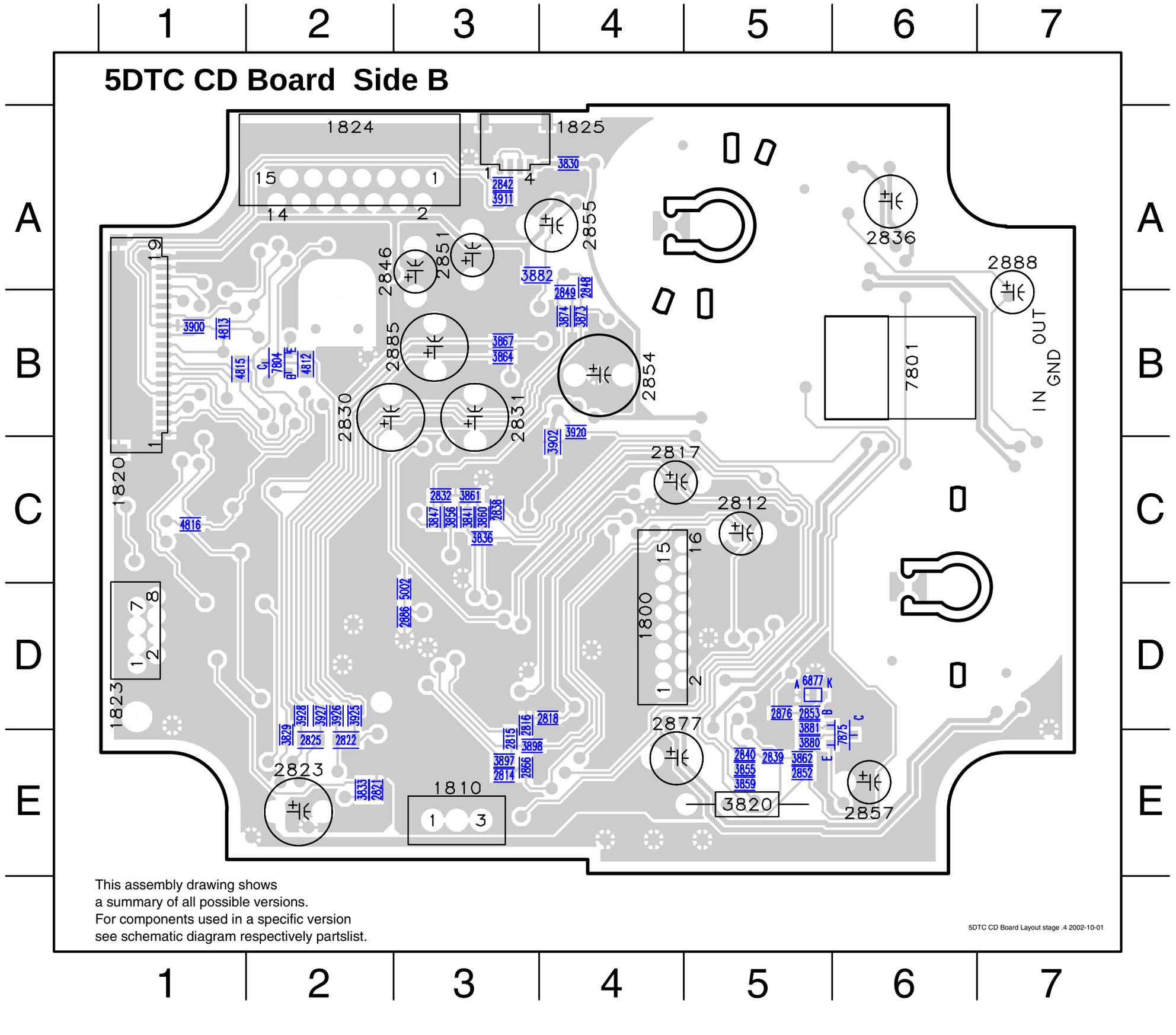
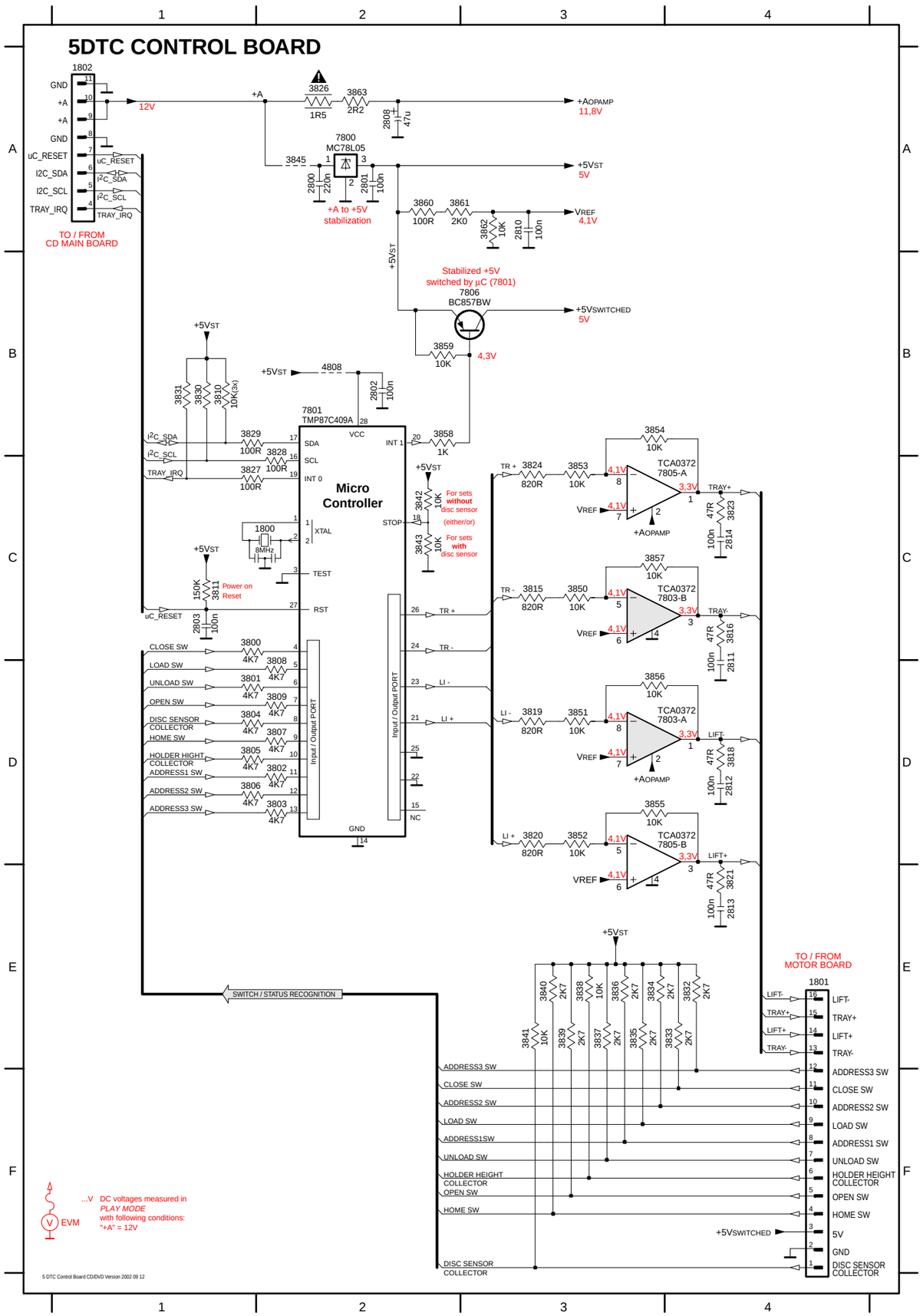
5DTC CD Board Side B



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

5DTC CD Board Layout stage .4 2002-10-01

1800 D5
1810 E3
1820 C1
1823 D1
1824 A3
1825 A4
2812 C5
2814 E4
2815 E4
2816 D4
2817 C5
2818 D4
2821 E3
2822 E3
2823 E2
2825 E2
2830 B2
2831 B4
2832 C3
2836 A6
2838 C4
2839 E5
2840 E5
2842 A4
2846 A3
2848 A4
2849 B4
2851 A3
2852 E6
2853 D6
2854 B5
2855 A4
2857 E6
2866 E4
2876 D5
2877 D5
2885 B3
2886 D3
2888 A7
3820 E5
3829 E2
3830 A4
3833 E3
3836 C3
3841 C3
3847 C3
3855 E5
3856 C3
3859 E5
3860 C3
3861 C3
3862 E6
3864 B4
3867 B4
3873 B4
3874 B4
3880 E6
3881 D6
3882 A4
3897 E4
3898 E4
3900 B1
3902 C4
3911 A4
3920 B4
3925 D3
3926 D2
3927 D2
3928 D2
4812 B2
4813 B2
4815 B2
4816 C1
5002 D3
6877 D6
7801 B6
7804 B2
7875 E6



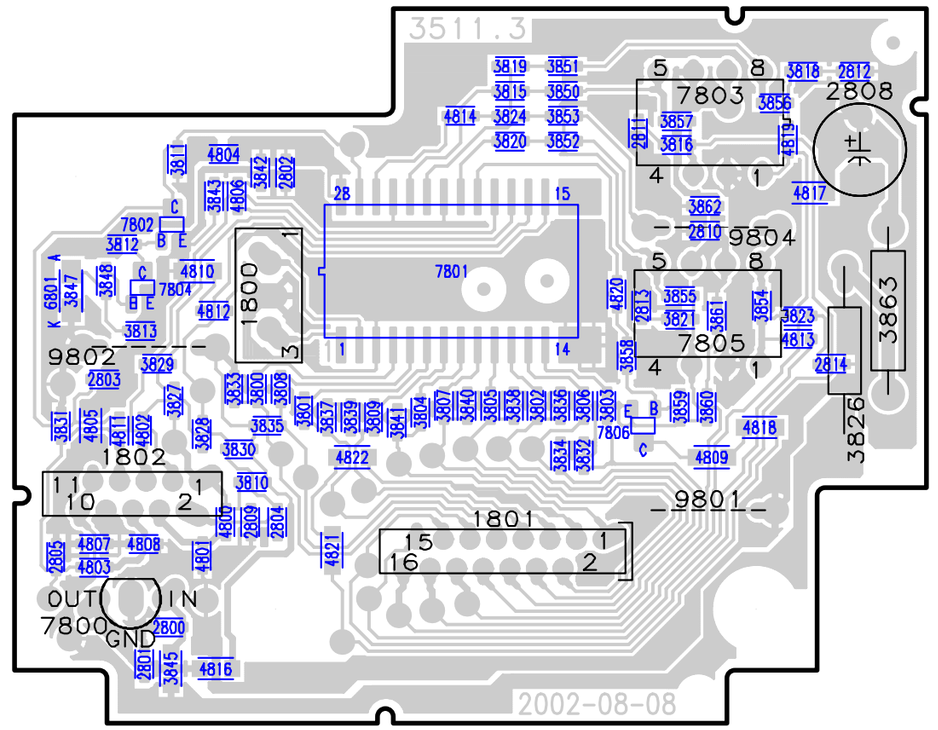
Mapping for Circuit Diagram

1800	C2	2810	A3	3804	D1	3811	C1	3824	C3	3833	E4	3841	E3	3854	B3	3862	A3	7805-B	D3
1801	E4	2811	D4	3805	D1	3815	C3	3826	A2	3834	E3	3842	C2	3855	D3	3863	A2	7806	B3
1802	A1	2812	D4	3806	D1	3816	C4	3827	C1	3835	E3	3843	C2	3856	D3	4808	B2		
2800	A2	2813	E4	3807	D2	3818	D4	3828	C2	3836	E3	3845	A2	3857	C3	7800	A2		
2801	A2	2814	C4	3808	D1	3819	D3	3829	B1	3837	E3	3850	C3	3858	B2	7801	B2		
2802	B2	3800	C1	3808	D2	3820	D3	3830	B1	3838	E3	3851	D3	3859	B3	7803-A	D3		
2803	C1	3802	D2	3809	D2	3821	E4	3831	B1	3839	E3	3852	D3	3860	A2	7803-B	C3		
2808	A2	3803	D2	3810	B1	3823	C4	3832	E4	3840	E3	3853	C3	3861	A2	7805-A	C3		

Mapping for Component Layout

1800	B2	2810	A5	3806	C4	3819	A4	3832	C4	3843	A2	3857	A5	4804	A2	4816	D2	7803	A5
1801	C4	2811	A5	3807	C3	3820	A4	3833	B2	3845	D2	3858	B5	4805	C1	4817	A6	7804	B2
1802	C2	2812	A6	3808	B2	3821	B5	3834	C4	3847	B1	3859	C5	4806	A2	4818	C5	7806	C5
2800	D2	2813	B5	3809	C3	3823	B6	3835	C2	3848	B1	3860	C5	4807	C1	4819	A6	9801	C5
2801	D2	2814	B6	3810	C2	3824	A4	3836	C4	3850	A4	3861	B5	4808	C2	4820	B5	9802	B2
2802	A2	3800	B2	3811	A2	3826	B6	3837	C3	3851	A4	3862	A5	4809	C5	4821	C3	9804	A5
2803	B1	3801	C3	3812	A1	3827	B2	3838	C4	3852	A4	3863	B6	4810	B2	4822	C3		
2804	C2	3802	C4	3813	B2	3828	C2	3839	C3	3853	A4	4800	C2	4811	C1	6801	B1		
2805	C1	3803	C4	3815	A4	3829	B2	3840	C4	3854	B5	4801	C2	4812	B2	7800	D2		
2808	A6	3804	C3	3816	A5	3830	C2	3841	C3	3855	B5	4802	C2	4813	B6	7801	B4		
2809	C2	3805	C4	3818	A6	3831	C1	3842	A2	3856	A6	4803	D1	4814	A4	7802	A2		

5DTC Control Board Copperside view



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

5DTC Control Board Layout stage .3 2002-09-25

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MP3 Board - Circuit Diagram

MP3-CD-2002

DSP

For Flash version: TMS320VC5416
For ROM version: TMS320VC5406

7451

only for FLASH version

Text version only

Flash EPROM

Am29LV800B

7450

EEPROM

M24C32

7458

Voltage stabilisation

7455 LM317D

for 5V front uP

74HCT1G04

74HC00D

16.93MHz CSTCV

TMS_RESET

.... only for FLASH version
* .... only for ROM version

2451 B5
2452 B2
2453 B4
2454 B7
2455 C2
2456 C12
2457 D9
2458 C10
2459 D2
2460 E13
2461 D12
2462 D2
2463 D8
2464 G12
2465 G2
2466 G8
2467 H6
2468 H4
2469 H5
2470 D9
2471 E11
2472 D1
3449 E11
3450 A4
3451 B7
3452 H3
3453 A12
3454 C1
3455 C9
3456 C10
3457 D13
3458 D14
3459 F13
3460 F13
3461 E12
3462 E2
3463 F1
3464 F13
3465 A2
3466 H8
3467 F8
3468 F8
3469 E13
3470 F1
3471 E13
3472 H9
3473 G2
3474 G8
3475 G2
3476 H2
3477 H7
3478 B6
3479 H8
3480 H2
3481 H3
3482 H5
3483 H6
3484 H5
3485 I11
3486 I13
3487 I12
3488 I12
3489 I12
3490 H8
3491 D9
3492 F9
3493 H12
3494 H8
3495 H11
3496 H8
3497 I13
3498 D14
3499 A2
4450 C13
4452 F9
4453 I11
5450 B3
6450 E13
6451 E13
7450 A10
7451 D5
7452 F13
7453 F12
7454-A G11
7454-B F11
7454-C F11
7454-D G11
7455 D13
7456 E12
7457 E9
7458 A1
7460 I12

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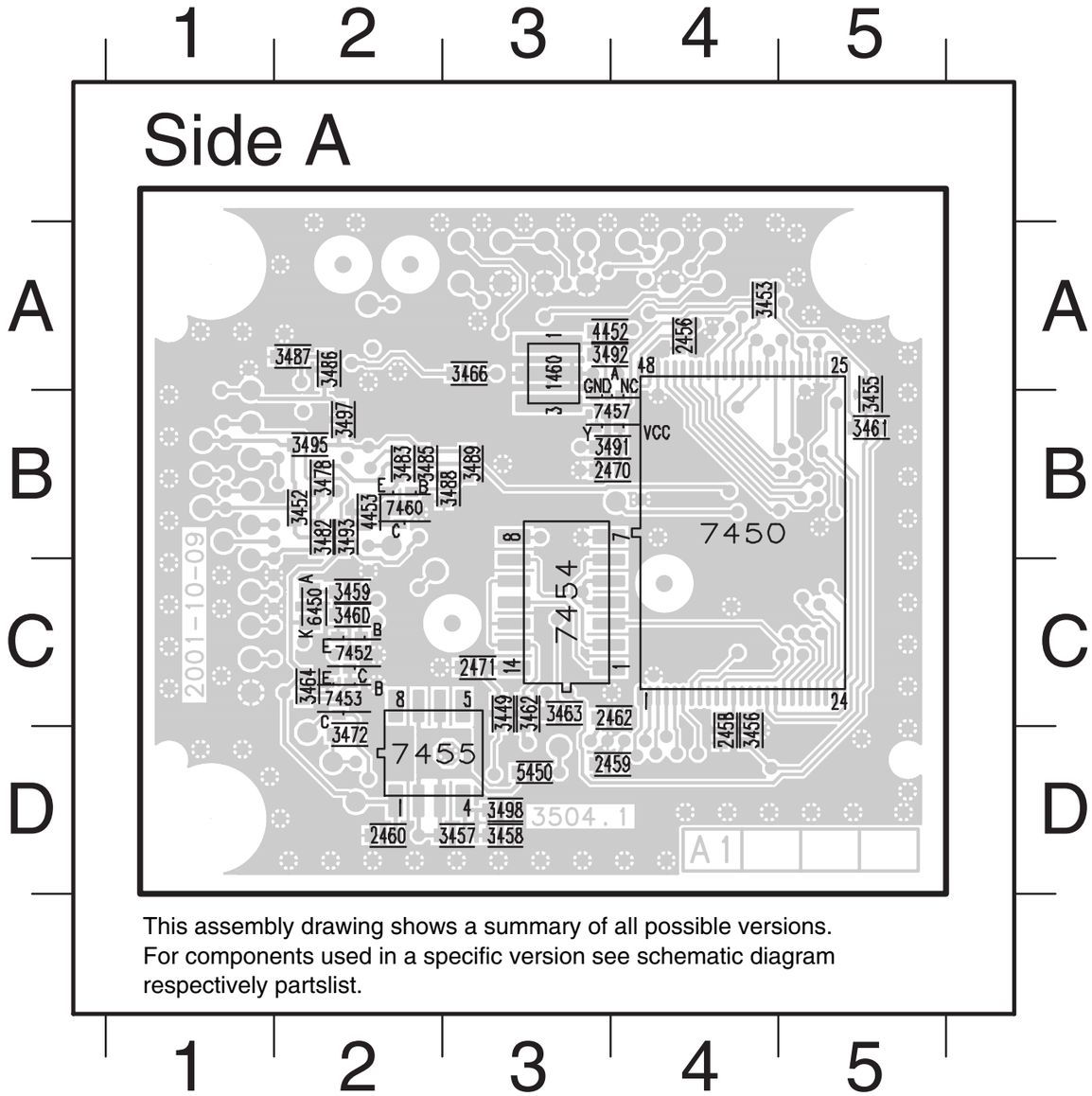
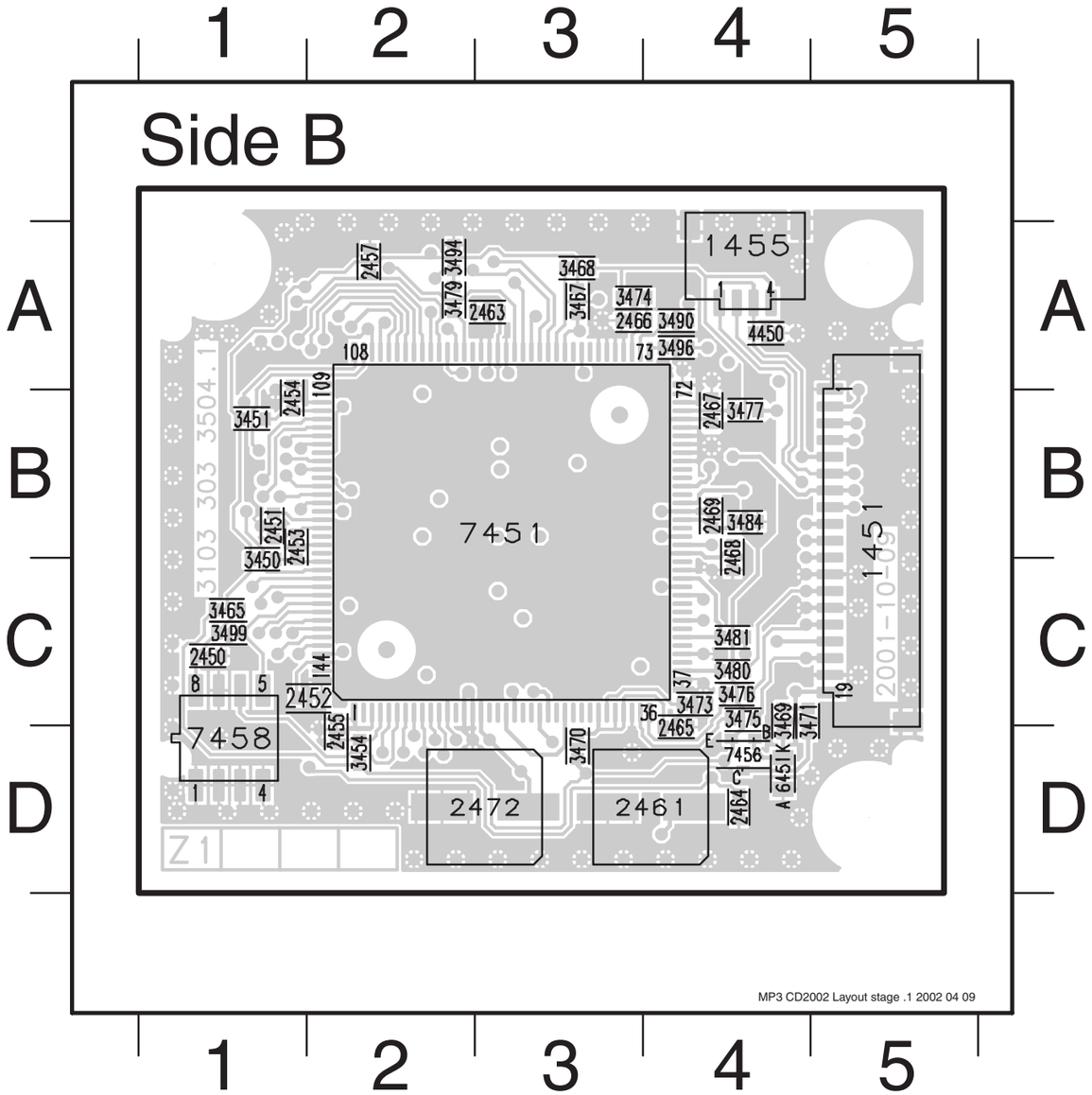
MP3 Board - Component Layout

1460 A3	3449 C3	3460 C2	3482 B2	3492 A3	6450 C2
2456 A4	3452 B2	3461 B5	3483 B2	3493 B2	7450 B4
2458 D4	3453 A4	3462 C3	3485 B2	3495 B2	7452 C2
2459 D4	3455 B5	3463 C3	3486 A2	3497 B2	7453 C2
2460 D2	3456 D4	3464 C2	3487 A2	3498 D3	7454 C3
2462 C4	3457 D3	3466 A3	3488 B3	4452 A3	7455 D2
2470 B4	3458 D3	3472 D2	3489 B3	4453 B2	7457 B4
2471 C3	3459 C2	3478 B2	3491 B4	5450 D3	7460 B2



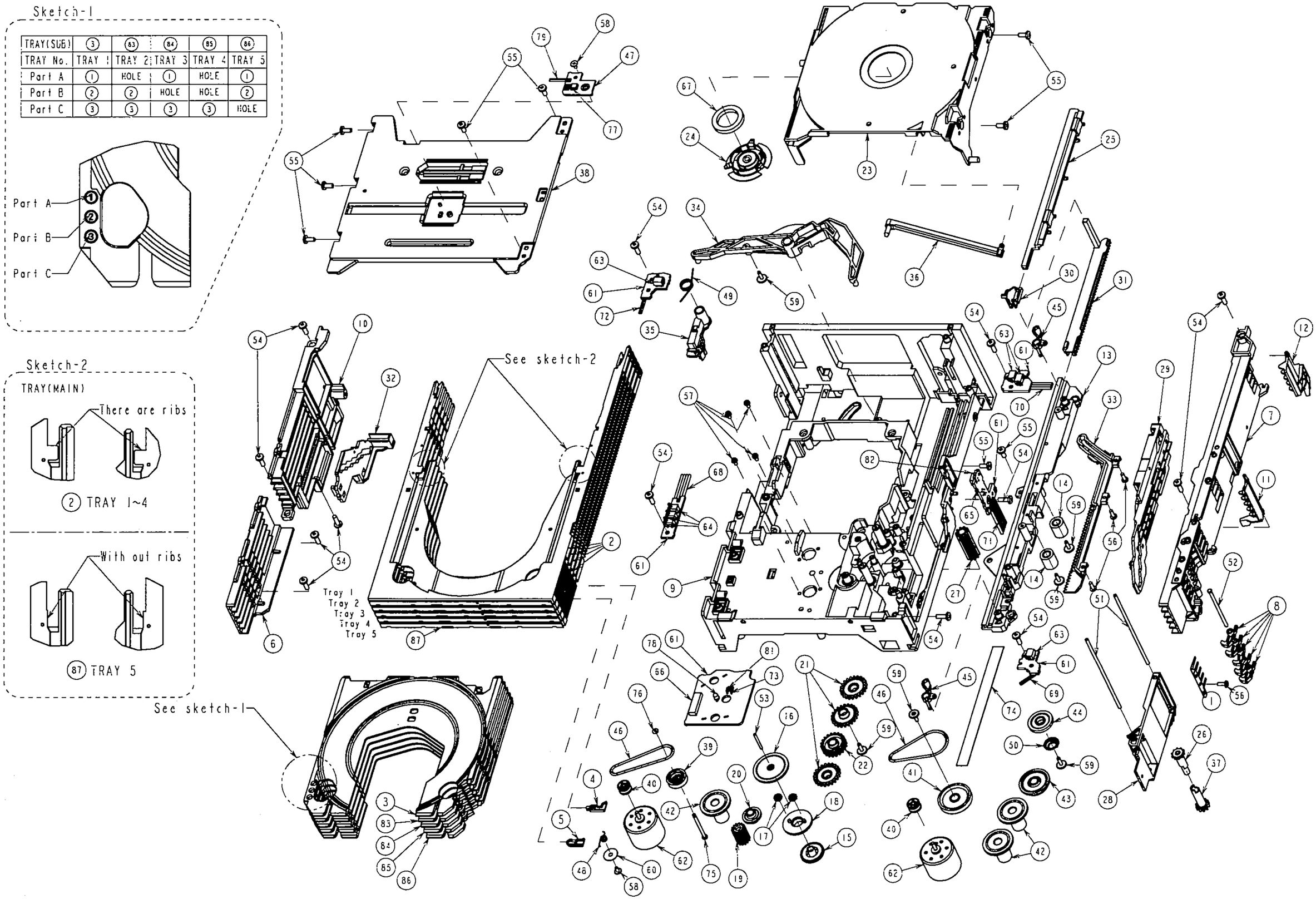
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

1451 B5	2457 A2	2469 B4	3469 C4	3479 A2	4450 A4
1455 A4	2461 D4	2472 D3	3470 D3	3480 C4	6451 D4
2450 C1	2463 A3	3450 C1	3471 C4	3481 C4	7451 B3
2451 B1	2464 D4	3451 B1	3473 C4	3484 B4	7456 D4
2452 C2	2465 D4	3454 D2	3474 A3	3490 A4	7458 D1
2453 B1	2466 A3	3465 C1	3475 C4	3494 A2	
2454 B1	2467 B4	3467 A3	3476 C4	3496 A4	
2455 D2	2468 B4	3468 A3	3477 B4	3499 C1	



10-16

Exploded view 5DTC mechanic - for orientation only



ELECTRICAL PARTSLIST 5DTC MODULE MP3CD Version CD Board

MECHANICAL PARTS

	3103 308 54710	**5DTC Module** (mechanic w/o electronic)
201	3103 309 05390	CD DRIVE DA12T3
252	4822 529 10387	Rubber damper CD DRIVE, FRONT
253	4822 529 10386	Rubber damper CD DRIVE, REAR

MISCELLANEOUS

	3103 308 67020	**MP3 Board**
1800	4822 267 11028	FFC-CONNECTOR 16P, Side entry
1820	2422 025 17303	FFC-CONNECTOR 19P, Side entry
1823	2422 025 16371	FFC-CONNECTOR 8P, Side entry
1824	4822 265 10979	FFC-CONNECTOR, 15P, Side entry
8001	3103 308 93090	FFC CABLE 16Pin 80mm BD
8051	3103 308 93100	FFC-CABLE 19Pin 90mm AD
8052	3103 308 93120	FFC CABLE 8Pin 80mm BD

CAPACITORS

2812	4822 124 11947	10µF	20%	16V
2813 ©	4822 126 13193	4,7nF	10%	63V
2814 ©	5322 126 11579	3,3nF	10%	63V
2815 ©	2020 552 94427	100pF	5%	50V
2816 ©	3198 017 42230	22nF	10%	50V
2817	4822 124 22726	4,7µF	20%	35V
2818 ©	3198 024 44730	47nF	5%	50V
2821 ©	2238 586 59812	100nF	10%	50V
2822 ©	4822 126 13344	1,5nF	5%	63V
2823	4822 124 42383	220µF	20%	4V
2824 ©	4822 126 14043	1µF	20%	16V
2825 ©	4822 126 13344	1,5nF	5%	63V
2826 ©	3198 017 34730	47nF	10%	16V
2827 ©	5322 126 11578	1nF	10%	63V
2828 ©	4822 126 11669	27pF	10%	50V
2829 ©	3198 017 34730	47nF	10%	16V
2830	4822 124 81286	47µF	20%	16V
2831	4822 124 81286	47µF	20%	16V
2832 ©	3198 017 31530	15nF	10%	50V
2833 ©	5322 126 11583	10nF	10%	63V
2834 ©	3198 017 31530	15nF	10%	50V
2835 ©	5322 126 11583	10nF	10%	63V
2836	4822 124 40433	47µF	20%	25V
2837 ©	3198 017 34730	47nF	10%	16V
2838 ©	3198 017 44740	470nF	20%	10V
2839 ©	2238 586 59812	100nF	10%	50V
2840 ©	4822 126 14549	33nF	10%	16V
2841 ©	2238 586 59812	100nF	10%	50V
2843 ©	2020 552 94427	100pF	5%	50V
2844 ©	5322 122 33861	120pF	5%	NP0
2845 ©	5322 122 33861	120pF	5%	NP0
2846	4822 124 40248	10µF	20%	63V
2847 ©	3198 017 41050	1µF	20%	10V
2848 ©	2020 552 94427	100pF	5%	50V
2849 ©	5322 122 33861	120pF	5%	NP0
2850 ©	5322 122 33861	120pF	5%	NP0
2851	4822 124 40248	10µF	20%	63V
2852 ©	4822 126 14549	33nF	10%	16V
2853 ©	5322 126 11583	10nF	10%	63V
2854	4822 124 12245	220µF	20%	16V
2855	4822 124 11912	220µF	20%	6,3V
2860 ©	4822 122 33753	150pF	5%	50V
2861 ©	4822 122 33753	150pF	5%	50V
2863 ©	4822 126 14508	180pF	5%	50V
2864 ©	4822 126 14508	180pF	5%	50V
2865 ©	4822 126 14508	180pF	5%	50V
2866 ©	4822 126 14508	180pF	5%	50V

CAPACITORS

2869 ©	3198 017 34730	47nF	10%	16V
2870 ©	4822 126 13883	220pF	5%	50V
2871 ©	4822 126 13883	220pF	5%	50V
2872 ©	4822 126 13883	220pF	5%	50V
2873 ©	4822 126 13883	220pF	5%	50V
2874 ©	4822 126 13883	220pF	5%	50V
2875 ©	4822 126 13883	220pF	5%	50V
2876 ©	3198 017 44740	470nF	20%	10V
2877	4822 124 40433	47µF	20%	25V
2878 ©	2238 586 59812	100nF	10%	50V
2879 ©	5322 126 11578	1nF	10%	63V
2880 ©	2222 867 15339	33pF	5%	50V
2881 ©	4822 126 14249	560pF	10%	50V
2882 ©	4822 126 14226	82pF		50V
2883 ©	3198 017 44740	470nF	20%	10V
2884 ©	3198 017 44740	470nF	20%	10V
2885	4822 124 40196	220µF	20%	16V
2886 ©	2238 586 59812	100nF	10%	50V
2887 ©	3198 017 34730	47nF	10%	16V

RESISTORS

3801 ©	4822 051 30563	56kΩ	5%	0,06W
3802 ©	4822 051 30563	56kΩ	5%	0,06W
3803 ©	4822 117 12925	47kΩ	1%	0,06W
3804 ©	4822 117 12925	47kΩ	1%	0,06W
3805 ©	4822 117 12925	47kΩ	1%	0,06W
3806 ©	4822 117 12925	47kΩ	1%	0,06W
3807 ©	4822 051 30103	10kΩ	5%	0,06W
3808 ©	4822 051 30103	10kΩ	5%	0,06W
3809 ©	4822 051 30103	10kΩ	5%	0,06W
3810 ©	4822 051 30103	10kΩ	5%	0,06W
3811 ©	4822 051 30103	10kΩ	5%	0,06W
3812 ©	4822 051 30103	10kΩ	5%	0,06W
3813 ©	4822 051 30222	2,2kΩ	5%	0,06W
3814 ©	4822 051 30222	2,2kΩ	5%	0,06W
3815 ©	4822 051 30222	2,2kΩ	5%	0,06W
3816 ©	4822 051 30222	2,2kΩ	5%	0,06W
3817 ©	4822 051 30479	47Ω	5%	0,06W
3818 ©	4822 051 30479	47Ω	5%	0,06W
3819 ©	4822 051 30479	47Ω	5%	0,06W
3820 ⚠	4822 052 10478	4,7Ω	5%	NFR25
3821 ©	4822 117 12917	1Ω	5%	0,06W
3822 ©	4822 051 30103	10kΩ	5%	0,06W
3823 ©	4822 051 30102	1kΩ	5%	0,06W
3824 ©	4822 051 30474	470kΩ	5%	0,06W
3825 ©	5322 117 13029	47kΩ	1%	0,06W
3826 ©	4822 117 12891	220kΩ	1%	0,06W
3827 ©	5322 117 13056	8,2kΩ	1%	0,06W
3828 ©	5322 117 13052	2,7kΩ	1%	0.06W
3829 ©	4822 051 30121	120Ω	5%	0,06W
3831 ©	4822 051 30471	470Ω	5%	0,06W
3832 ©	4822 051 30471	470Ω	5%	0,06W
3833 ©	4822 051 30121	120Ω	5%	0,06W
3834 ©	4822 051 30472	4,7kΩ	5%	0,06W
3836 ©	4822 117 13632	100kΩ	1%	0,06W
3837 ©	4822 051 30471	470Ω	5%	0,06W
3839 ©	4822 051 30471	470Ω	5%	0,06W
3840 ©	4822 051 30223	22kΩ	5%	0,06W
3841 ©	4822 051 30153	15kΩ	5%	0,06W
3842 ©	4822 051 30102	1kΩ	5%	0,06W
3843 ©	4822 051 30102	1kΩ	5%	0,06W
3844 ©	4822 051 30101	100Ω	5%	0,06W
3845 ©	4822 051 30471	470Ω	5%	0,06W

ELECTRICAL PARTSLIST 5DTC MODULE MP3CD Version CD Board

RESISTORS

3846 ©	4822 051 30102	1kΩ	5%	0,06W	
3847 ©	4822 117 12968	820Ω	5%	0,06W	
3848 ©	4822 051 30221	220Ω	5%	0,06W	
3849 ©	4822 051 30471	470Ω	5%	0,06W	
3850 ©	4822 117 12925	47kΩ	1%	0,06W	
3851 ©	4822 117 12968	820Ω	5%	0,06W	
3852 ©	4822 051 30221	220Ω	5%	0,06W	
3854 ©	4822 117 12925	47kΩ	1%	0,06W	
3855 ©	4822 051 30393	39kΩ	5%	0,06W	
3856 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3857 ©	4822 051 30008	CHIP JUMPER 0603			
3859 ©	4822 117 13632	100kΩ	1%	0,06W	
3860 ©	4822 051 30123	12kΩ	5%	0,06W	
3861 ©	4822 051 30153	15kΩ	5%	0,06W	
3862 ©	4822 051 30393	39kΩ	5%	0,06W	
3864 ©	4822 051 30333	33kΩ	5%	0,06W	
3865 ©	4822 051 30181	180Ω	5%	0,06W	
3866 ©	4822 117 13608	4,7Ω	5%	0,06W	
3867 ©	4822 051 30333	33kΩ	5%	0,06W	
3868 ©	4822 051 30183	18kΩ	5%	0,06W	
3869 ©	4822 051 30183	18kΩ	5%	0,06W	
3870 ©	4822 051 30681	680Ω	5%	0,06W	
3871 ©	4822 051 30181	180Ω	5%	0,06W	
3872 ©	4822 051 30272	2,7kΩ	5%	0,06W	
3873 ©	4822 051 30333	33kΩ	5%	0,06W	
3874 ©	4822 051 30333	33kΩ	5%	0,06W	
3875 ©	4822 051 30183	18kΩ	5%	0,06W	
3876 ©	4822 051 30183	18kΩ	5%	0,06W	
3877 ©	4822 051 30681	680Ω	5%	0,06W	
3878 ©	4822 051 30471	470Ω	5%	0,06W	
3879 ©	4822 051 30223	22kΩ	5%	0,06W	
3880 ©	4822 051 30339	33Ω	5%	0,06W	
3881 ©	4822 051 30151	150Ω	5%	0,06W	
3883 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3884 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3888 ©	4822 051 30103	10kΩ	5%	0,06W	
3889 ©	4822 051 30471	470Ω	5%	0,06W	
3890 ©	4822 051 30471	470Ω	5%	0,06W	
3891 ©	4822 051 30102	1kΩ	5%	0,06W	
3892 ©	4822 051 30102	1kΩ	5%	0,06W	
3893 ©	4822 051 30471	470Ω	5%	0,06W	
3895 ©	4822 051 30273	27kΩ	5%	0,06W	
3896 ©	4822 051 30101	100Ω	5%	0,06W	
3897 ©	4822 051 30333	33kΩ	5%	0,06W	
3898 ©	4822 051 30221	220Ω	5%	0,06W	
3899 ©	4822 051 30272	2,7kΩ	5%	0,06W	
3901 ©	4822 051 30561	560Ω	5%	0,06W	
3902 ©	4822 117 11139	1,5kΩ	1%	0,1W	
3903 ©	4822 051 30332	3,3kΩ	5%	0,06W	
3904 ©	4822 051 30332	3,3kΩ	5%	0,06W	
3905 ©	4822 051 30681	680Ω	5%	0,06W	
3906 ©	4822 051 30471	470Ω	5%	0,06W	
3907 ©	4822 117 12968	820Ω	5%	0,06W	
3908 ©	4822 051 30222	2,2kΩ	5%	0,06W	
3909 ©	4822 117 13632	100kΩ	1%	0,06W	
3910 ©	4822 051 30471	470Ω	5%	0,06W	
3912 ©	4822 051 30221	220Ω	5%	0,06W	
3916 ©	4822 051 30471	470Ω	5%	0,06W	
3917 ©	4822 117 13608	4,7Ω	5%	0,06W	
3918 ©	4822 051 30103	10kΩ	5%	0,06W	
3919 ©	4822 051 30153	15kΩ	5%	0,06W	
3920 ©	4822 051 30101	100Ω	5%	0,06W	
3923 ©	4822 051 30103	10kΩ	5%	0,06W	

RESISTORS

3925 ©	4822 051 30101	100Ω	5%	0,06W	
3926 ©	4822 051 30101	100Ω	5%	0,06W	
3927 ©	4822 051 30101	100Ω	5%	0,06W	
3928 ©	4822 051 30101	100Ω	5%	0,06W	
4807 ©	4822 051 30008	CHIP JUMPER 0603			
4809 ©	4822 051 30008	CHIP JUMPER 0603			
4820 ©	4822 051 30008	CHIP JUMPER 0603			
4824 ©	4822 051 30008	CHIP JUMPER 0603			
4835 ©	4822 051 20008	CHIP JUMPER 0805			
4836 ©	4822 051 20008	CHIP JUMPER 0805			
4837 ©	4822 051 20008	CHIP JUMPER 0805			
4838 ©	4822 051 20008	CHIP JUMPER 0805			
4840 ©	4822 051 20008	CHIP JUMPER 0805			
4841 ©	4822 051 20008	CHIP JUMPER 0805			
4843 ©	4822 051 20008	CHIP JUMPER 0805			

COILS

1810	2422 540 98519	RESONATOR 8,467MHz
5001 ©	2422 549 44607	FERRITE BEAD
5002 ©	2422 549 44607	FERRITE BEAD

DIODES

6877 ©	9322 129 34685	BZX284-C3V9

TRANSISTORS

7875 ©	5322 130 42755	BC847C
7876 ©	5322 130 42755	BC847C
7877 ©	5322 130 42755	BC847C
7878 ©	5322 130 42755	BC847C
7879 ©	5322 130 60123	BC807-40

INTEGRATED CIRCUITS

7800 ©	9352 684 20557	SAA7325H/T/M2B, Signal Processor
7801	4822 209 72554	MC7808CT 8V Regulator
7802 ©	9322 181 79668	MM1469PH Motor Driver
7810 ©	5322 209 82941	LM358D, Dual Opamp
7811 ©	5322 209 82941	LM358D, Dual Opamp

ELECTRICAL PARTSLIST 5DTC MODULE MP3CD Version Control Board

MECHANICAL PARTS

	3103 308 54710	**5DTC Module** (mechanic w/o electronic)

MISCELLANEOUS

1801	2422 025 17065	FFC-CONNECTOR 16P, top entry
1802	2422 025 17788	FFC-CONNECTOR 8P, top entry
8021	3103 308 93110	FFC-CABLE 16Pin 60mm AD

CAPACITORS

2800 ©	4822 126 13879	220nF	20%	16V
2801 ©	2238 586 59812	100nF	10%	50V
2802 ©	2238 586 59812	100nF	10%	50V
2803 ©	2238 586 59812	100nF	10%	50V
2808	4822 124 40433	47µF	20%	25V
2810 ©	3198 017 34730	47nF	10%	16V
2811 ©	2238 586 59812	100nF	10%	50V
2812 ©	2238 586 59812	100nF	10%	50V
2813 ©	2238 586 59812	100nF	10%	50V
2814 ©	2238 586 59812	100nF	10%	50V

RESISTORS

3800 ©	4822 051 30472	4,7kΩ	5%	0,06W
3801 ©	4822 051 30472	4,7kΩ	5%	0,06W
3802 ©	4822 051 30472	4,7kΩ	5%	0,06W
3803 ©	4822 051 30472	4,7kΩ	5%	0,06W
3804 ©	4822 051 30472	4,7kΩ	5%	0,06W
3805 ©	4822 051 30472	4,7kΩ	5%	0,06W
3806 ©	4822 051 30472	4,7kΩ	5%	0,06W
3807 ©	4822 051 30472	4,7kΩ	5%	0,06W
3808 ©	4822 051 30472	4,7kΩ	5%	0,06W
3809 ©	4822 051 30472	4,7kΩ	5%	0,06W
3810 ©	4822 051 30103	10kΩ	5%	0,06W
3811 ©	4822 051 30154	150kΩ	5%	0,0625W
3815 ©	5322 117 13057	820Ω	1%	0,06W
3816 ©	4822 051 30479	47Ω	5%	0,06W
3818 ©	4822 051 30479	47Ω	5%	0,06W
3819 ©	5322 117 13057	820Ω	1%	0,06W
3820 ©	5322 117 13057	820Ω	1%	0,06W
3821 ©	4822 051 30479	47Ω	5%	0,06W
3823 ©	4822 051 30479	47Ω	5%	0,06W
3824 ©	5322 117 13057	820Ω	1%	0,06W
3826 ⚠	4822 117 12148	1,5Ω	5%	0,33W
3827 ©	4822 051 30101	100Ω	5%	0,06W
3828 ©	4822 051 30101	100Ω	5%	0,06W
3829 ©	4822 051 30101	100Ω	5%	0,06W
3830 ©	4822 051 30103	10kΩ	5%	0,06W
3831 ©	4822 051 30103	10kΩ	5%	0,06W
3832 ©	4822 051 30272	2,7kΩ	5%	0,06W
3833 ©	4822 051 30272	2,7kΩ	5%	0,06W
3834 ©	4822 051 30272	2,7kΩ	5%	0,06W
3835 ©	4822 051 30272	2,7kΩ	5%	0,06W
3836 ©	4822 051 30272	2,7kΩ	5%	0,06W
3837 ©	4822 051 30272	2,7kΩ	5%	0,06W
3838 ©	4822 051 30103	10kΩ	5%	0,06W
3839 ©	4822 051 30272	2,7kΩ	5%	0,06W
3840 ©	4822 051 30272	2,7kΩ	5%	0,06W
3841 ©	4822 051 30103	10kΩ	5%	0,06W
3842 ©	4822 051 30103	10kΩ	5%	0,06W
3845 ©	4822 051 20159	15Ω	5%	0,1W
3850 ©	4822 117 12706	10kΩ	1%	0,06W
3851 ©	4822 117 12706	10kΩ	1%	0,06W
3852 ©	4822 117 12706	10kΩ	1%	0,06W
3853 ©	4822 117 12706	10kΩ	1%	0,06W
3854 ©	4822 117 12706	10kΩ	1%	0,06W

RESISTORS

3855 ©	4822 117 12706	10kΩ	1%	0,06W
3856 ©	4822 117 12706	10kΩ	1%	0,06W
3857 ©	4822 117 12706	10kΩ	1%	0,06W
3858 ©	4822 051 30102	1kΩ	5%	0,06W
3859 ©	4822 051 30103	10kΩ	5%	0,06W
3860 ©	5322 117 13017	100Ω	1%	0,06W
3861 ©	2322 704 62002	2kΩ	1%	0,06W
3862 ©	4822 117 12706	10kΩ	1%	0,06W
3863	4822 053 10228	2,2Ω	5%	1W
4800 ©	4822 051 30008	CHIP JUMPER 0603		
4802 ©	4822 051 30008	CHIP JUMPER 0603		
4803 ©	4822 051 30008	CHIP JUMPER 0603		
4804 ©	4822 051 30008	CHIP JUMPER 0603		
4805 ©	4822 051 20008	CHIP JUMPER 0805		
4806 ©	4822 051 30008	CHIP JUMPER 0603		
4807 ©	4822 051 30008	CHIP JUMPER 0603		
4808 ©	4822 051 30008	CHIP JUMPER 0603		
4809 ©	4822 051 20008	CHIP JUMPER 0805		
4810 ©	4822 051 20008	CHIP JUMPER 0805		
4811 ©	4822 051 30008	CHIP JUMPER 0603		
4812 ©	4822 051 30008	CHIP JUMPER 0603		
4813 ©	4822 051 30008	CHIP JUMPER 0603		
4814 ©	4822 051 30008	CHIP JUMPER 0603		
4816 ©	4822 051 20008	CHIP JUMPER 0805		
4817 ©	4822 051 20008	CHIP JUMPER 0805		
4818 ©	4822 051 20008	CHIP JUMPER 0805		
4819 ©	4822 051 30008	CHIP JUMPER 0603		
4820 ©	4822 051 30008	CHIP JUMPER 0603		
4821 ©	4822 051 20008	CHIP JUMPER 0805		
4822 ©	4822 051 20008	CHIP JUMPER 0805		

COILS

1800	4822 242 72066	CERAMIC FILTER 8,0MHz

TRANSISTORS

7806 ©	3198 010 42320	BC857BW

INTEGRATED CIRCUITS

7800	4822 209 72042	MC78L05ACP, STABILIZER
7801 ©	3103 307 01640	TMP87P809M Microcontroller
7803	4822 209 62059	TCA0372DP1, 2-FOLD OP-AMP.
7805	4822 209 62059	TCA0372DP1, 2-FOLD OP-AMP.

ELECTRICAL PARTSLIST 5DTC MODULE MP3CD Version MP3 Board

MISCELLANEOUS

1451	2422 025 17303	FFC-CONNECTOR 19P,side entry

CAPACITORS

2450 ©	2238 586 59812	100nF	10%	50V	
2451 ©	3198 017 41050	1µF	20%	10V	
2452 ©	3198 017 41050	1µF	20%	10V	
2453 ©	2238 586 59812	100nF	10%	50V	
2454 ©	2238 586 59812	100nF	10%	50V	
2455 ©	2238 586 59812	100nF	10%	50V	
2456 ©	2238 586 59812	100nF	10%	50V	
2457 ©	5322 126 11583	10nF	10%	63V	
2458 ©	5322 126 11583	10nF	10%	63V	
2459 ©	3198 017 41050	1µF	20%	10V	
2460 ©	2238 586 59812	100nF	10%	50V	
2461 ©	4822 124 81059	220µF	20%	4V	
2462 ©	3198 017 41050	1µF	20%	10V	
2463 ©	3198 017 41050	1µF	20%	10V	
2464 ©	2238 586 59812	100nF	10%	50V	
2465 ©	2238 586 59812	100nF	10%	50V	
2466 ©	2238 586 59812	100nF	10%	50V	
2467 ©	3198 017 41050	1µF	20%	10V	
2468 ©	3198 017 41050	1µF	20%	10V	
2469 ©	2238 586 59812	100nF	10%	50V	
2470 ©	2238 586 59812	100nF	10%	50V	
2471 ©	2238 586 59812	100nF	10%	50V	

RESISTORS

3449 ©	4822 051 30101	100Ω	5%	0,06W
3450 ©	4822 117 12971	15Ω	5%	0,06W
3451 ©	4822 117 12971	15Ω	5%	0,06W
3452 ©	4822 051 30101	100Ω	5%	0,06W
3453 ©	4822 051 30109	10Ω	5%	0,06W
3454 ©	4822 117 12971	15Ω	5%	0,06W
3455 ©	4822 051 30102	1kΩ	5%	0,06W
3456 ©	4822 051 30102	1kΩ	5%	0,06W
3457 ©	5322 117 13051	680Ω	1%	0,06W
3458 ©	5322 117 13061	180Ω	1%	0,06W
3459 ©	4822 051 30221	220Ω	5%	0,06W
3460 ©	4822 051 30102	1kΩ	5%	0,06W
3461 ©	4822 051 30479	47Ω	5%	0,06W
3462 ©	4822 051 30101	100Ω	5%	0,06W
3463 ©	4822 051 30101	100Ω	5%	0,06W
3464 ©	4822 051 30103	10kΩ	5%	0,06W
3465 ©	4822 051 30101	100Ω	5%	0,06W
3466 ©	4822 051 30471	470Ω	5%	0,06W
3467 ©	4822 051 30103	10kΩ	5%	0,06W
3468 ©	4822 051 30103	10kΩ	5%	0,06W
3469 ©	4822 051 30101	100Ω	5%	0,06W
3470 ©	4822 117 12971	15Ω	5%	0,06W
3471 ©	4822 051 30339	33Ω	5%	0,06W
3472 ©	4822 051 30154	150kΩ	5%	0,06W
3473 ©	4822 117 13632	100kΩ	1%	0,06W
3474 ©	4822 117 12971	15Ω	5%	0,06W
3475 ©	4822 051 30101	100Ω	5%	0,06W
3476 ©	4822 051 30101	100Ω	5%	0,06W
3477 ©	4822 051 30471	470Ω	5%	0,06W
3478 ©	4822 051 30471	470Ω	5%	0,06W
3479 ©	4822 051 30471	470Ω	5%	0,06W
3480 ©	4822 051 30101	100Ω	5%	0,06W
3481 ©	4822 051 30101	100Ω	5%	0,06W
3482 ©	4822 051 30471	470Ω	5%	0,06W
3483 ©	4822 051 30101	100Ω	5%	0,06W

RESISTORS

3484 ©	4822 117 12971	15Ω	5%	0,06W
3486 ©	4822 051 30101	100Ω	5%	0,06W
3488 ©	4822 117 13632	100kΩ	1%	0,06W
3489 ©	4822 051 30103	10kΩ	5%	0,06W
3490 ©	4822 051 30101	100Ω	5%	0,06W
3491 ©	4822 051 30479	47Ω	5%	0,06W
3492 ©	4822 051 30105	1MΩ	5%	0,06W
3493 ©	4822 051 30103	10kΩ	5%	0,06W
3494 ©	4822 051 30103	10kΩ	5%	0,06W
3495 ©	4822 051 30103	10kΩ	5%	0,06W
3497 ©	4822 051 30103	10kΩ	5%	0,06W
3498 ©	4822 051 30332	3,3kΩ	5%	0,06W
3499 ©	4822 051 30103	10kΩ	5%	0,06W
4450 ©	4822 051 30008	CHIP JUMPER 0603		

COILS

1460	4822 242 10989	CER.RES. 16,9MHz
5450 ©	4822 157 11074	100µH

DIODES

6450 ©	4822 130 11411	BZX284-C3V3
6451 ©	4822 130 11366	BZX284-C3V9
7454	4822 130 34174	BZX79-B4V7

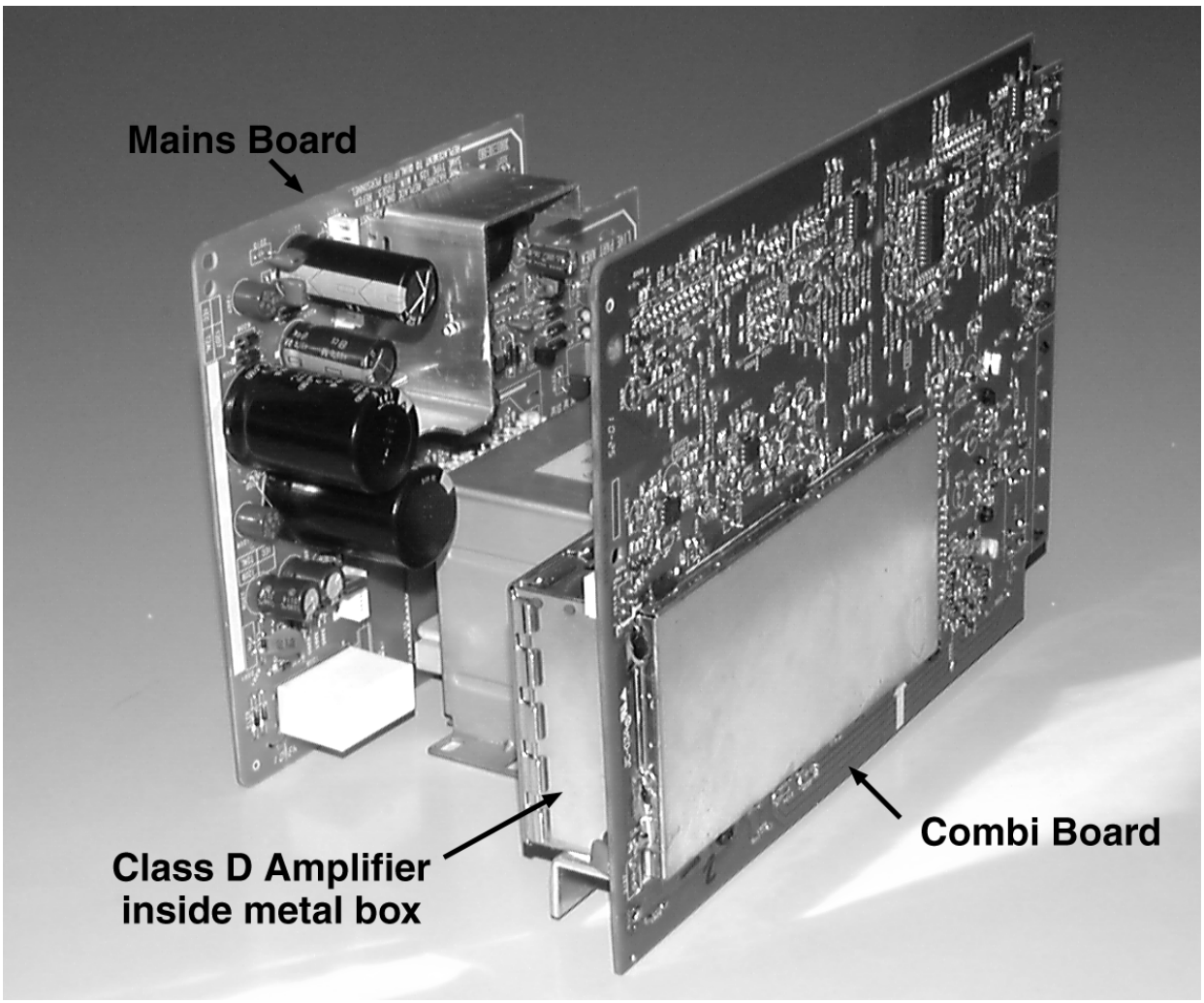
TRANSISTORS

7452 ©	3198 010 42310	BC847BW
7453 ©	3198 010 42310	BC847BW
7456 ©	3198 010 42310	BC847BW
7460 ©	3198 010 42310	BC847BW

INTEGRATED CIRCUITS

7451 ©	not available	please order complete MP3 Board
7455 ©	4822 209 17108	LM317LD Voltage Regulator
7457 ©	9352 456 50115	HC1G04, Inverter
7458 ©	9322 130 41668	M24C64, EEPROM

3103 308 67020 **MP3 Board**



Power 2003 Module

(100W Class D)

stage M.5/C.2

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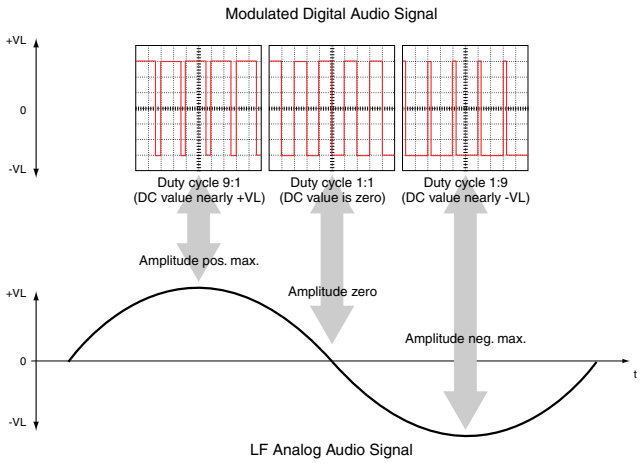
Class-D Circuit Description (Based on Power 2003 Module -100W Class D)

Basically Class-D works by transforming the LF audio input to a square wave signal with a fixed frequency and a variable duty cycle. See simplified drawing below.



The amplitude of the square wave signal is equal to the supply voltage of the amplifier. With the audio signal the square wave signal is pulse-width modulated.

Compared to a conventional power amplifier the benefits of the Class D amplifier are:

- higher effiency
- lower power dissipation
- smaller cooling fin
- smaller mains transformer

Disadvantage of this concept is:

- 500kHz square wave signal with high current requires a shielding box to suppress radiation.

Required Circuitries:

- **500kHz square wave oscillator**.
  The oscillator frequency is created by 7312-C; it is a dual-frequency oscillator with ceramic resonators 5300 and 5302, which resonate at 500kHz and 425kHz respectively. The resonators are switched by transistors 7309 and 7316, controlled by the "OZ_SW" line from the port expander 7406.
  The reason for 2 frequencies is to avoid tuner disturbances in the AM-band.
  The oscillator signal is shaped to square wave with 7312-B, afterwards buffered and fed to the amplifier modulators (ROZ to the right channel, LOZ to the left). One channel gets inverted clock to balance supply loading.

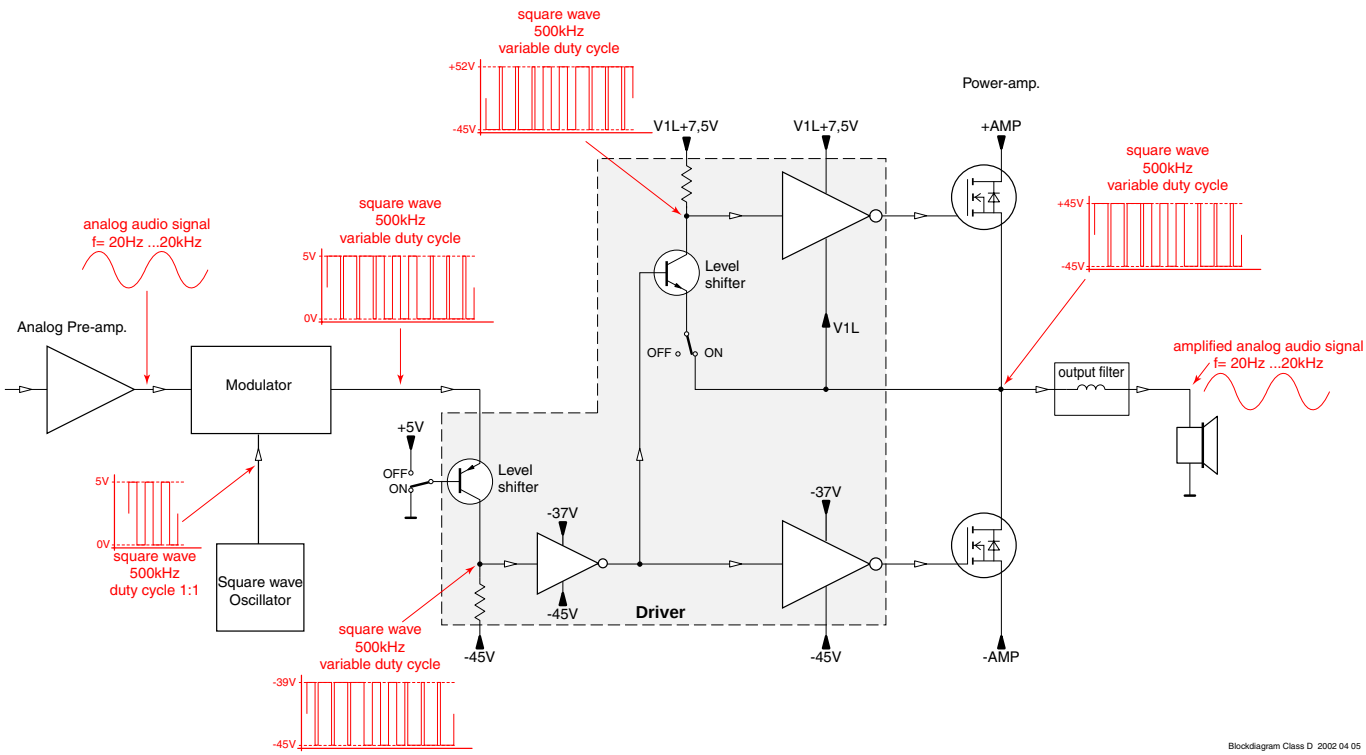
- **Modulator**
  The modulator forms the pulse width modulated signal. For each channel a seperate modulation is required.

- **Power FETs**
  The FETs require drivers which supply the gates. One for the high-side-FET and one for the low-side-FET. Because of the different supply voltages also an additional level shifter is necessary per driver.

- **Output filter**
  The output filter is necessary to block the 500kHz square wave signal from the speaker.
  It consists of a series-mode coil 5101 and a capacity of approx. 550nF (2116, 2134), which forms a Chebycheff filter with 40kHz cut-off frequency at 6Ω load. For EMC reasons both, the speaker output and the return ground are fed through a common mode coil 5102, the filter is further improved by splitting the output capacity into 2116 before and 2134 after the common mode coil.

Blockdiagram Class D

All above mentioned circuitries are located inside the metal shielding box.



Class-D Circuit Description (Based on Power 2003 Module - 100W Class D)

Functional Description:

Refers to the left channel in schematic diagrams.
The first stage of the modulator is an error integrator which compares the input to the (22 dB amplified) output signal of the power stage. The difference is leading to a current, which loads the integrator 7122-A. The second stage (7122-B) is again integrating, thus creating high gain at low frequency, which leads to high feedback and low distortion. The next stage is a comparator, which compares the integrated voltage to a triangle wave - thus creating a voltage controlled duty cycle. The comparator is realized by cascaded gates.
At pin 18 of IC7122 there is a square wave with the same frequency and duty cycle as the desired output.

The next task is to feed this information to the output FETs. Both FETs are n-channel types, so they are modulated by feeding the gate in respect to the source connection. We use inverters 74LV14 as drivers. The driver for the low-side FET (7121) is supplied by the negative supply -VL2 and a voltage +VL generated by 7115 and 6113, which is 7.5V higher than -VL2. The digital signal is level-shifted by 7128 to the negative supply reference. 3142, 6111 and 2126 together is a delay circuit for rising edges by approx. 100ns and 3154,6109 and 2137 for falling edge by 50ns. This is to compensate the switch-off delay of the FETs and ensures that both FETs are not conducting at the same time.
The high-side FET (7109) is controlled by the inverted signal taken from pin 2 of 7118-A, which is level-shifted by transistor 7119. The driver for the high-side FET is supplied by a floating voltage between the amplifier output -V1L and +V1L, created by the charge pump 6110, 2114 regulated by 7114 and 6114 to a 7.5V higher level. The pump is additionally supplied (via 3151) by +45V to ensure supply at start-up (no signal). The necessary delay for the rising edge is generated by the level-shifter (mainly the pull-up 3117) and the input capacity of the driver (pin 13 of 7105-F).
The last stage in the gate driver consists of three gates in parallel for increased output current for the capacitive load, afterwards comes a 47Ω series resistor for soft rising edges and a transistor for very fast falling edges. This combination gives the best compromise of efficiency and radiation.

Protection Circuits:

The amplifier is protected against low load impedance (including short circuit). Current is sensed by shunts 3101, 3130 in both supplies. Overcurrent at the positive supply is then sensed by 7104, the negative supply overcurrent triggers 7117, which then also triggers 7104. The collector current then triggers the monoflop 7122-E and -F, giving a high pulse at pin 10. This shuts off level-shifter 7128 and triggers transistor 7129, which draws current into the emitter resistors (3134, 3127) of level-shifter 7119, which is therefore also shut off. So both FETs are shut off for approx. 0.2 sec, afterwards the amplifier tries to work again, but if the overload continues the on-time is only a few cycles.

The shut-off mechanism is also used to shut off the amplifier during headphone usage; this is done by pulling pin 13 of 7122-F high. The line "AMP_OFF" is controlled by the port expander 7406.

The loudspeakers are protected against DC voltages resulting e.g. from defective FETs, voltages higher than ±2V are detected by 7110+7112 and pull down the "DC_PROT" line, which disables the speaker relay 1201.

The gain of the class-D amplifier is 22dB, adjusted by the feedback resistors 3135, 3136, 3149 and the input resistors 3139, 3340. The input reference voltage for 7122-A is approx. half the supply, therefore 3144, 3148 are used for offset compensation. This compensation can be fine-tuned by the potentiometer 3306 to reach <1mV DC output.

Service Hints

The analog part of the Combi Board can be repaired without opening the metal shielding box. In case of a 'Class D' problem it is advised to disassemble the board first, desolder the metal bottom of the shielding box and assemble the board again. This takes a few minutes only.

Attention: Poor soldering of the metal shielding box results in disturbance of the tuner.

In most cases the FETs 7109 and/or 7121 for the left channel, respectively 7218 and/or 7231 for the right channel will be defective. This can be checked easily with an ordinary Ohm-meter.

LEFT CHANNEL:
In case **7109** is defect replace following parts:
7109, 7111, 7105, 7119, 7104, 3101, 3103 and 2106

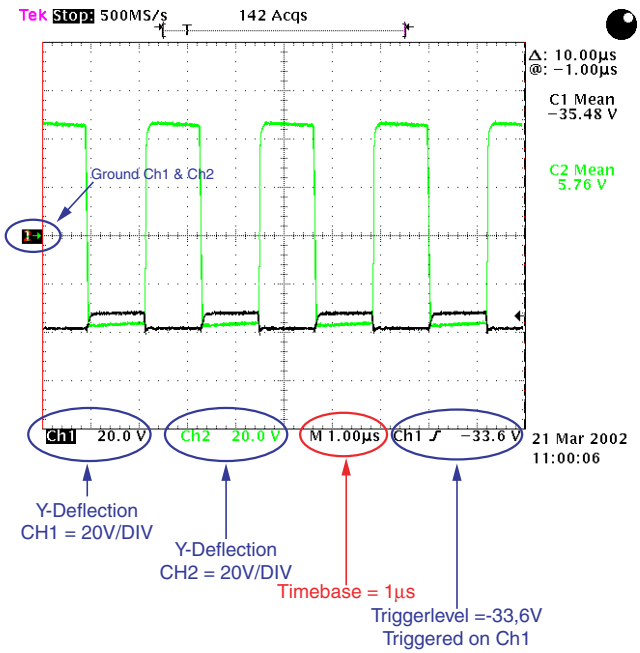
In case **7121** is defect replace following parts:
7121, 7113, 7118, 7117,3129, 3130 and 2118

RIGHT CHANNEL:
In case **7218** is defect replace following parts:
7218, 7221, 7209, 7228, 7208, 3205, 3209 and 2206

In case **7231** is defect replace following parts:
7231, 7210, 7235, 7227, 3241, 3243 and 2220

If none of the FETs is defective the fault is most probably located in the modulator. To check the operation - follow the given signals.

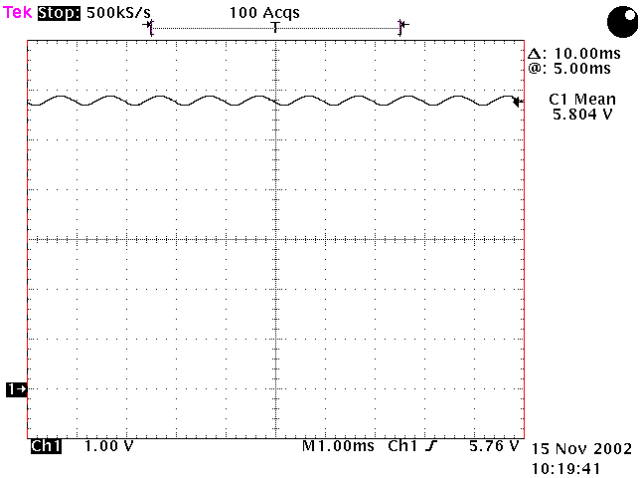
General description of Oscilloscope setup:



The following signals are measured on condition:
AUX in = 500mV/1kHz, Volume = -28dB
Load = 2 x 6Ω

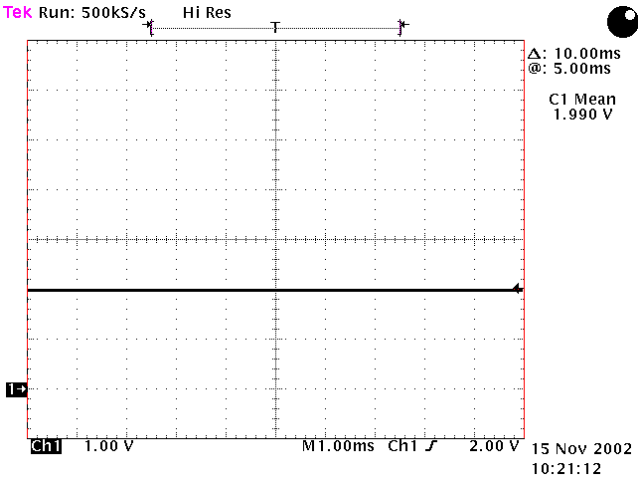
Measuring point Ⓐ can be found on circuit diagram 3.
All other measuring points are shown on circiut diagram 4 respectively 5.

Measuring point Ⓐ: Output pre-amplifier

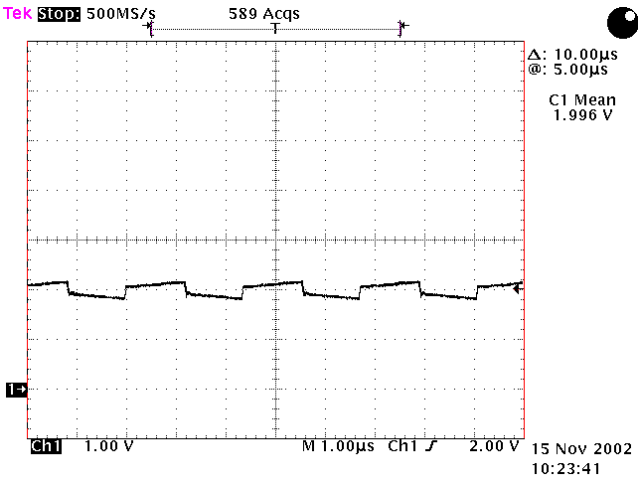


Normal analog signal measured (1kHz- Timebase 1µs). If this signal can´t be measured - the fault is outside the shielding box.

Measuring point Ⓑ: Input Modulator

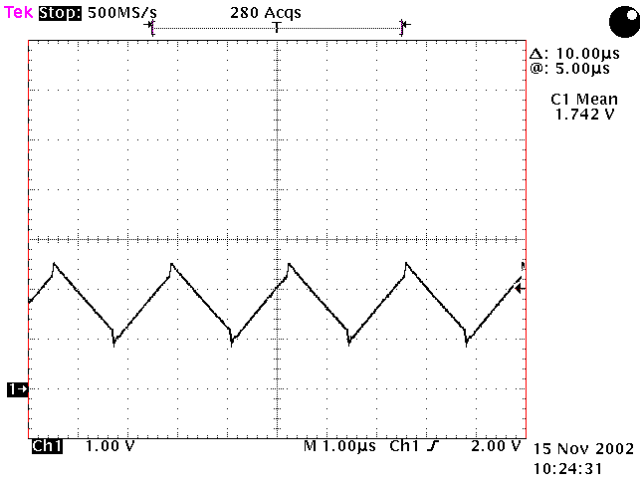


The 1kHz signal not visible anymore. Reducing the timebase to 1µs shows the oscillogram below.



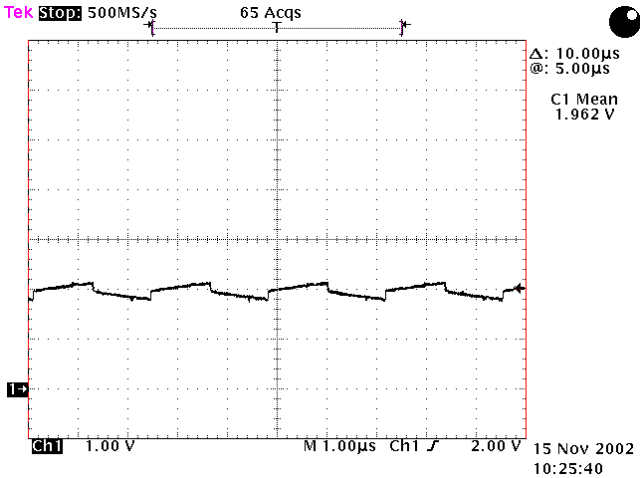
Service Hints

Measuring point Ⓒ:



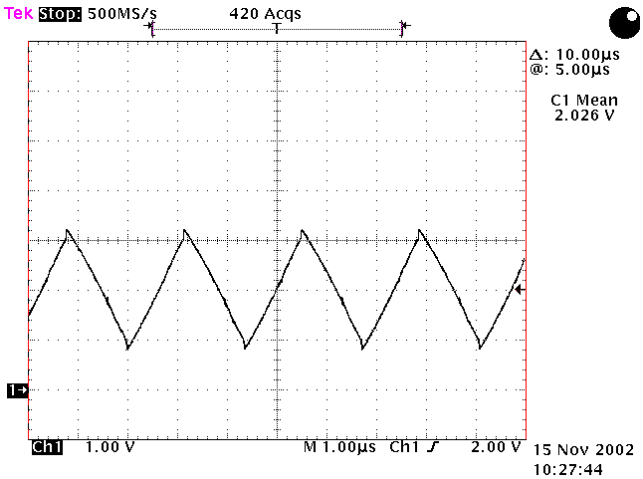
The first stage of the modulator is an integrator. An integrated rectangle results in a triangle.

Measuring point Ⓓ:



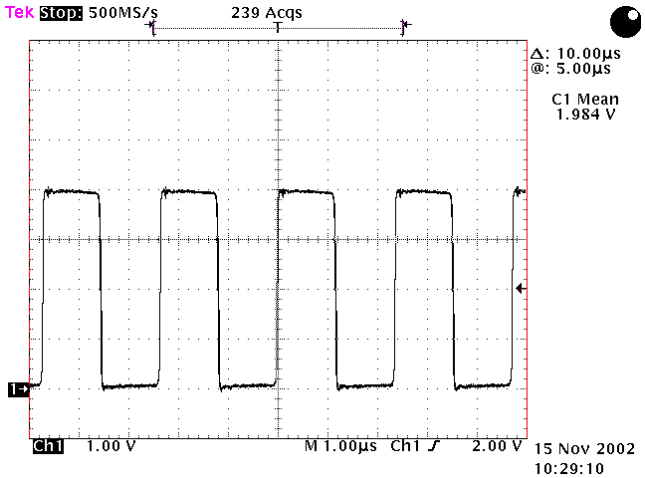
The oscillator signal (squarewave) is fed to the second integrator (7122-B).

Measuring point Ⓔ:



The integrated rectangle results in a triangle. 7122-C and 7122-F work as a comparator.

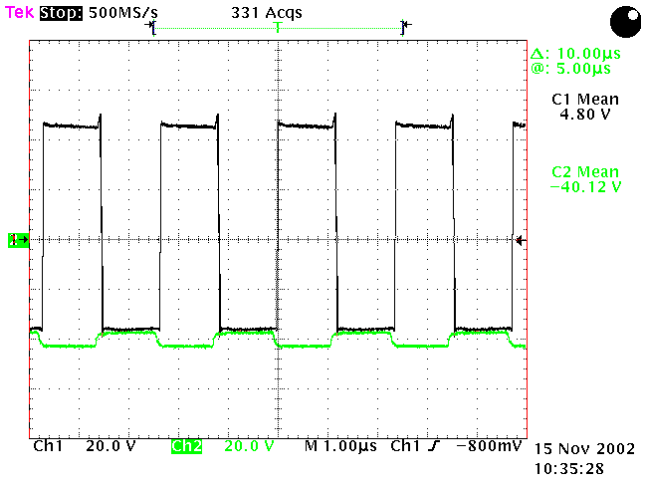
Measuring point Ⓕ: Output modulator



In this pulse width modulated square wave the analog Audio signal is included. Measurements with an analog scope will show a jitter on the falling edge.

The modulator frequency is still fixed to 500kHz. Similar to a frequency modulation - in this case the amplitude of the analog audio signal varies the pulse width, the frequency defines the speed.

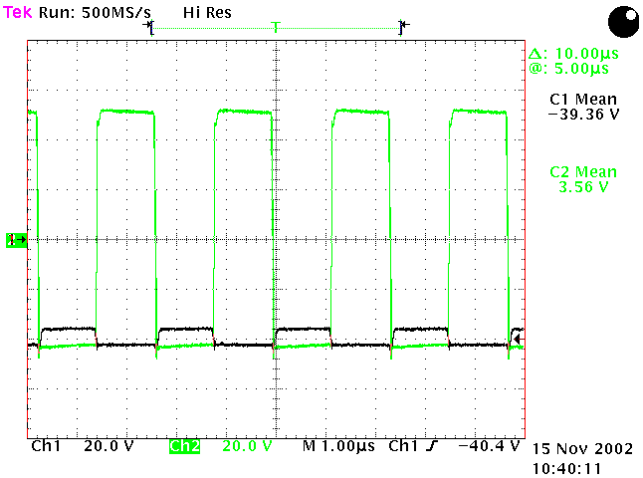
Measuring point Ⓖ:



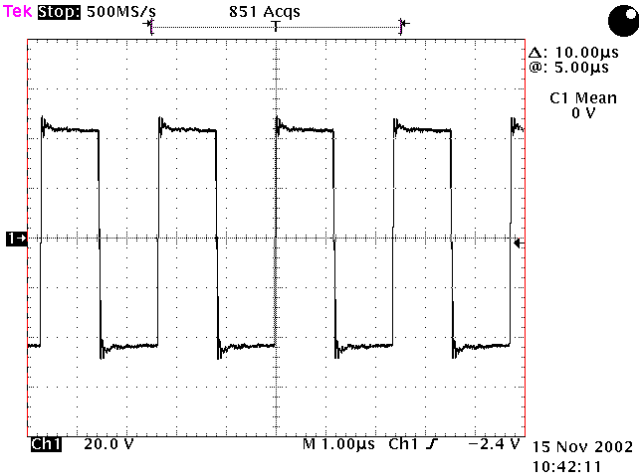
The low-side driver signal (Ch1) is the modulator output level-shifted by transistor 7128. The high-side driver signal (Ch2) is the inverted low-side driver signal level-shifted by transistor 7119.

Service Hints

Measuring point Ⓗ: gate-signal of the FETs



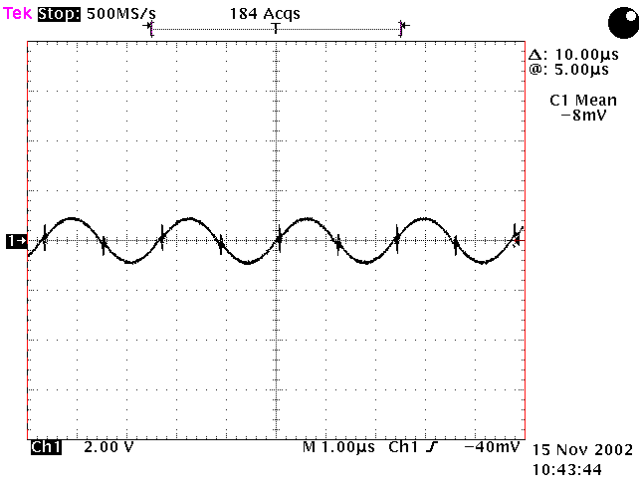
Measuring point Ⓘ:

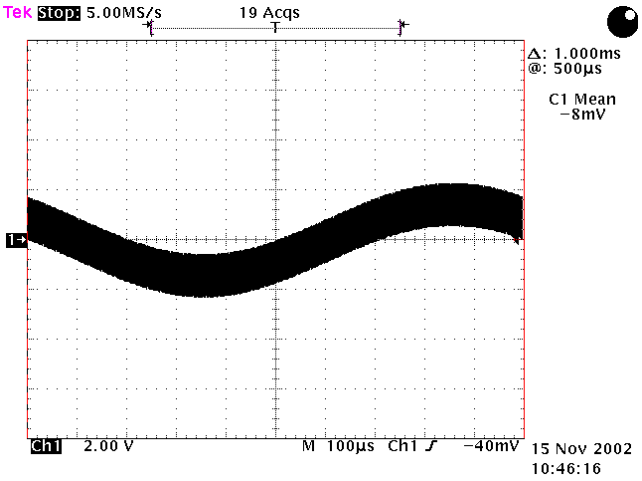


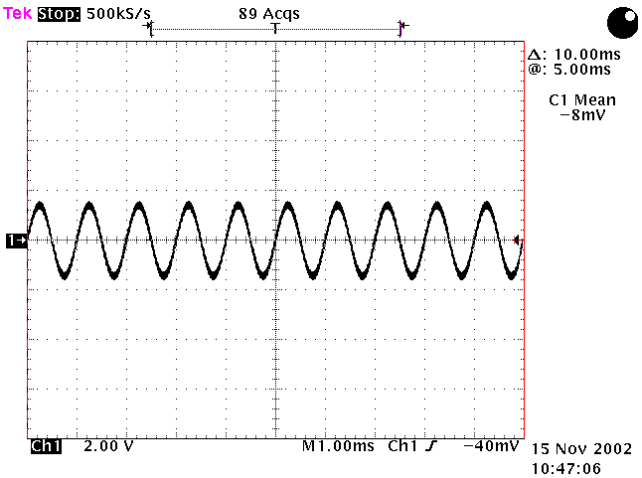
Digital output signal.

Measuring point Ⓙ:

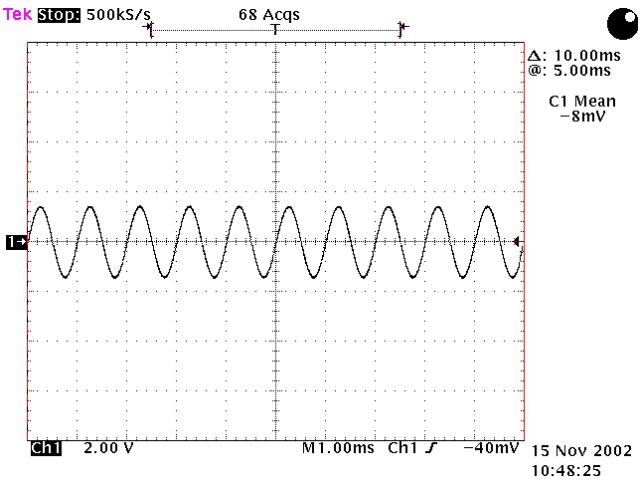
The following three signals are measured after output filter 5101 with different timebases.







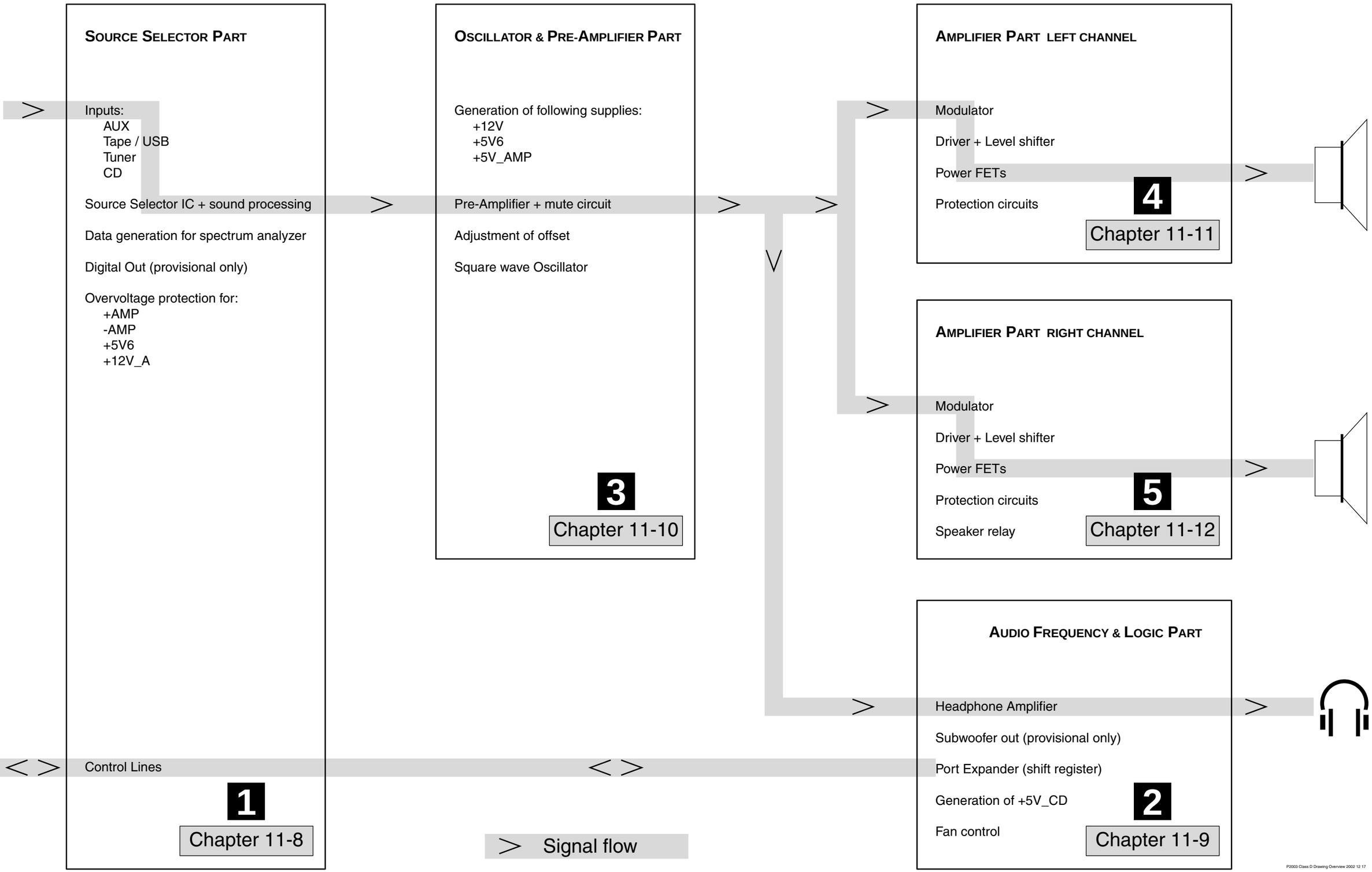
Measuring point Ⓚ:



After common mode coil 5102 - the audio signal is restored.

11-7

Power 2003 100W Class D
Combi Board Circuit Diagram Overview



P2003 Class D Drawing Overview 2002 12 17

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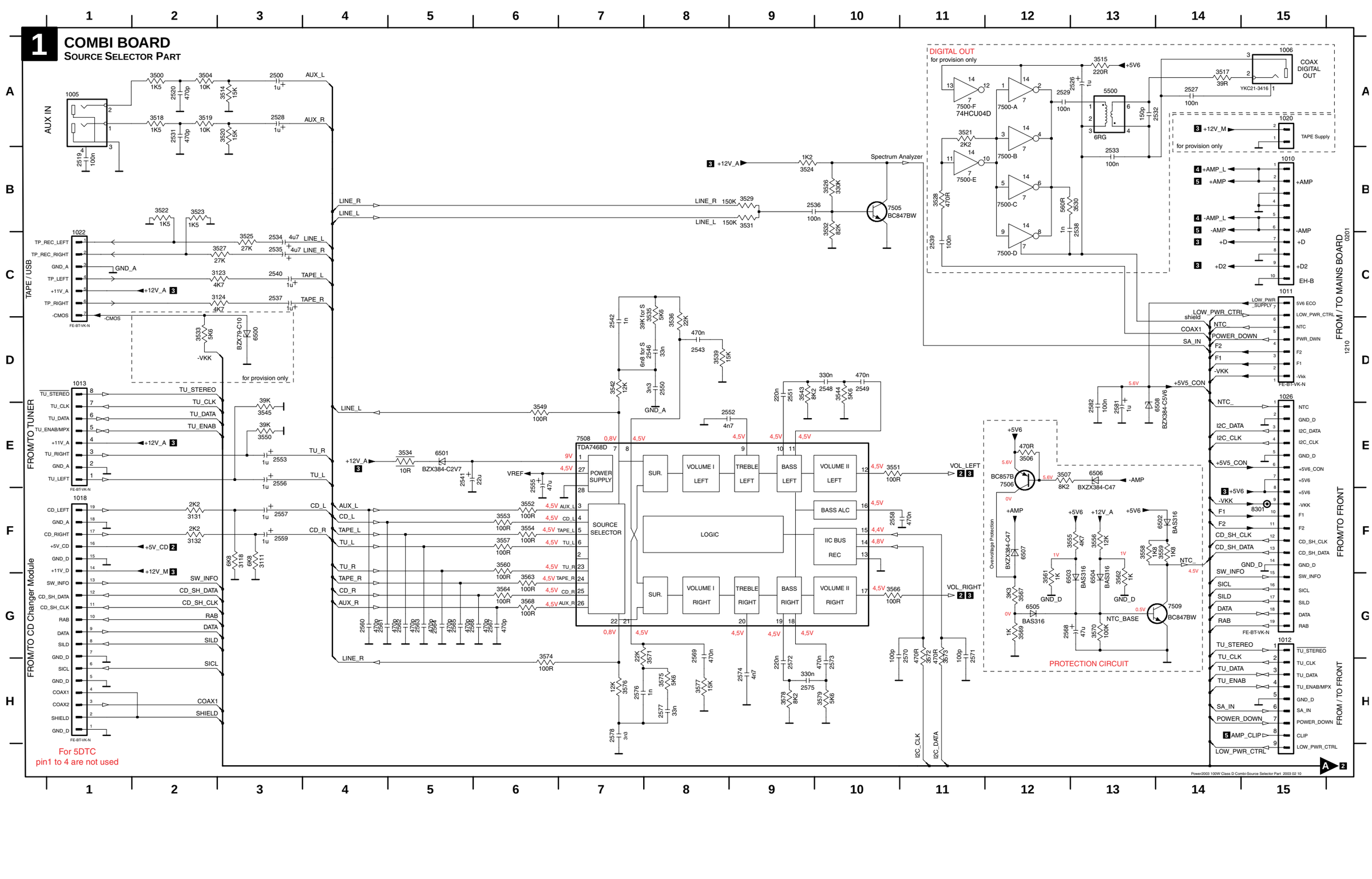
1005	A1	1022	B1	2528	A3	2537	B3	2548	D10	2556	E3	2564	G5	2572	H9	2582	D12	3518	A2	3526	B10	3534	C5	3549	E6	3557	F6	3566	G11	3574	H6	6500	C3	6508	D13	7505	B10
1006	A15	1026	D15	2529	A12	2538	B13	2549	D10	2557	F3	2565	G5	2573	H10	3500	A2	3519	A3	3527	B3	3535	C8	3550	E3	3558	F13	3567	G12	3575	H8	6501	C5	6510	E13	7506	E12
1010	B15	1311	C1	2531	A2	2539	C11	2550	D8	2558	F11	2566	G6	2574	H9	3504	A3	3520	A3	3528	B11	3536	D8	3551	E10	3559	F14	3568	G6	3576	H7	6502	F14	7500-A	A12	7508	E7
1011	C15	2500	A3	2532	A13	2540	C3	2551	D9	2559	F3	2567	G6	2575	H9	3506	E12	3521	A11	3529	B9	3539	D8	3552	F6	3560	F6	3569	G12	3577	H8	6503	G13	7500-B	B12	7509	G14
1012	G15	2519	A1	2533	B13	2541	D6	2552	E8	2560	G4	2568	G12	2576	H7	3507	F12	3522	A2	3530	B13	3542	D7	3553	F6	3561	G12	3570	G13	3578	H9	6504	G13	7500-C	B12	7510	E13
1013	D1	2520	A2	2534	B3	2542	D6	2553	E3	2561	G4	2569	G8	2577	H8	3514	A3	3523	B2	3531	B9	3543	D9	3554	F6	3562	G13	3571	G8	3579	H10	6505	G12	7500-D	C12	8301	F14
1018	F1	2526	A13	2535	B3	2543	D8	2554	E2	2562	G5	2570	G10	2578	H7	3515	A13	3524	B9	3532	B10	3544	D10	3555	F13	3563	G6	3572	G10	4501	D13	6506	F12	7500-E	B11		
1020	A15	2527	A14	2536	B9	2546	D8	2555	E6	2563	G5	2571	G11	2581	E13	3517	A14	3525	B3	3533	C2	3545	E3	3556	F13	3564	G6	3573	G11	5500	A13	6507	F12	7500-F	A11		



11-9

1004 E1 1014 G1 1400 D13 1401 E9 2400 B3 2401 C3 2402 B5 2403 C1 2404 C3 2405 C4 2406 D1 2407 D3 2408 D1 2409 D3 2410 D5 2411 E3 2412 E4 2413 E1 2414 F2 2415 E8 2416 D8 2417 F4 2418 H2 2419 H2 3400 B3 3401 C3 3402 C5 3403 C2 3404 C2 3405 C2 3406 C4 3407 D2 3408 D2 3409 D2 3410 D5 3411 D7 3412 D8 3413 D3 3415 E3 3418 E2 3419 F2 3420 F3 3421 F3 3422 F4 3423 F5 3424 G2 3425 G4 3426 G4 3427 G11 3428 G11 3429 G5 3430 G5 3431 G9 3432 G3 3433 G4 3434 G10 3435 H14 3436 H5 3437 H8 3438 H10 3439 H5 3440 H7 6400 D8 6401 G14 6402 H8 6403 H8 7400-A D3 7400-B C3 7402 D8 7403 F3 7404 F2 7405 F4 7406 F12 7407 G2 7408 G3 7409 G9 7410 G4 7411 H8 8302 E12 9268 G8

2 COMBI BOARD

AUDIO FREQUENCY & LOGIC PART

HEADPHONE AMPLIFIER

from Source Selector 7506

VOL_LEFT 2403 1u +12V_A 3405 5K6 V_MID 5.2V 2406 470u 3407 4K7 3401 470R 3403 27K 3404 6K8 2401 470p 2404 100p 3400 27K 2400 100p 7400-B NJM4556AM 5.2V 2402 AMP_LEFT 100u 3406 10R 11.5V 6405 BAS316 +12V_A 2405 4u7 3K3 3402

VOL_RIGHT 2408 1u 3408 6K8 3409 27K 3413 470R 2409 470p 2407 100p GND_A 7400-A NJM4556AM 2410 AMP_RIGHT 100u 3K3 3410 2411 100p 3415 27K GND_A 22u 2412

provisional

SUBWOOFER OUT 1004 YKC21-3416 2413 100n 3418 470R SUB_W 3419 2K2 2414 470p 7403 BC817-25 2K2 3420 AMP_MUTE 3

7404 BC817-25 MUTE 2K2 3421 7405 BC857BW 4.8V +5V 1u 2417 3422 4K7 4.6V 3423 10K MUTE_SW

FROM/TO HP SOCKET BOARD 1014 FE-BT-VK-N HP_DET HP_RIGHT GND_A HP_LEFT 3424 10K +5V 100p 2418 2419 100p 39R 3425 39R 3426 39R 3429 39R 3430 BC817-25 7407 0.8V BC817-25 7408 0.8V 3432 1K 3433 1K MUTE 7410 BC857BW 4.8V +5V 1u 2420 3436 4K7 4.1V 3439 10K MUTE_HP

4.1V = MUTE
4.8V = ACTIVE

FAN CONTROL

Fan runs permanently.
Higher volume increases the speed.

2 +12V_M 3412 5R6 BZX384-C3V3 6403 11.5V FAN_CONT 5 4K7 3411 8.2V..11V 7402 BC337-40 7.5V..10.3V 2416 100u 1401 FAN 2415 1u EH-B

+5V_CD 4.4V 2R2 3440 BC807-25W(COL) 7411 4.7V 1N4148 6402 +5V6 for 3DTC versions only for 5DTC versions a wire bridge is stuffed instead of 6402 3437 5K6 3.9V 5K6 3431 0V BC817-25W(COL) 7409 0.7V 3434 2K2 3438 10K

10K 3427 10K 3428

PORT EXPANDER

7406 M62320FP

4 AMP_OFF AMP_OFF MUTE_SW HP_DET MUTE_HP 3 OZ_SW 5 AMP_RELAIS

D0 D1 D2 D3 D4 D5 D6 D7 I/O PORT 8 DATA LATCHES OUT I/O 8 8 REG SHIFT 8 RES PWR TRANSCEIVER I²C BUS CHIP SELECT CS2 CS1 CS0 SO GND VDD SDA SCL

+5V +5V6 1N4148 6401 3435 270R 4.1V 100n 2421 GND_D

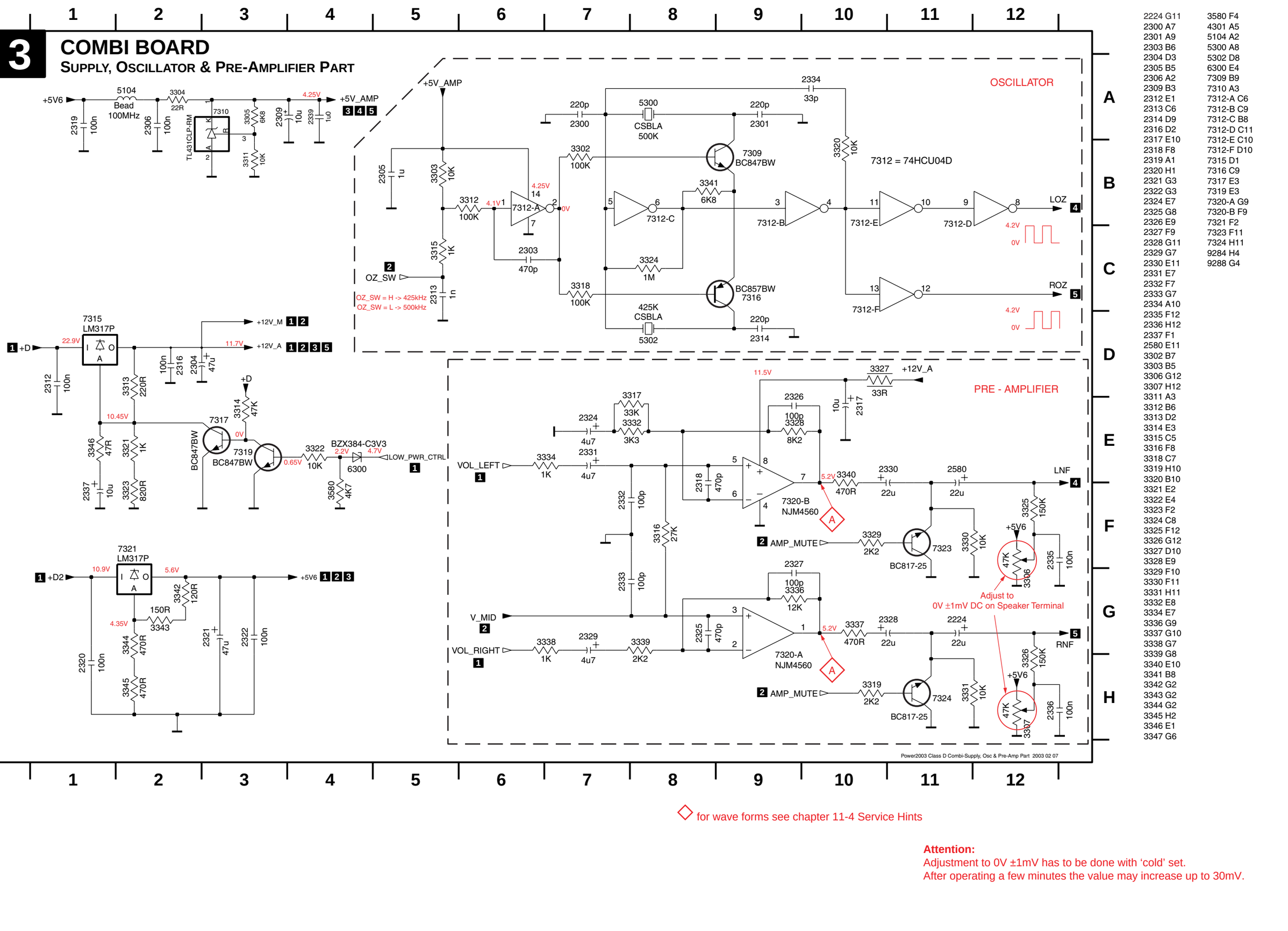
I2C_DATA I2C_CLK

1 A

11-10

3 COMBI BOARD

SUPPLY, OSCILLATOR & PRE-AMPLIFIER PART



◇ for wave forms see chapter 11-4 Service Hints

Attention:
Adjustment to 0V ±1mV has to be done with ‘cold’ set.
After operating a few minutes the value may increase up to 30mV.

2224 G11
2300 A7
2301 A9
2303 B6
2304 D3
2305 B5
2306 A2
2309 B3
2312 E1
2313 C6
2314 D9
2316 D2
2317 E10
2318 F8
2319 A1
2320 H1
2321 G3
2322 G3
2324 E7
2325 G8
2326 E9
2327 F9
2328 G11
2329 G7
2330 E11
2331 E7
2332 F7
2333 G7
2334 A10
2335 F12
2336 H12
2337 F1
2580 E11
3302 B7
3303 B5
3306 G12
3307 H12
3311 A3
3312 B6
3313 D2
3314 E3
3315 C5
3316 F8
3318 C7
3319 H10
3320 B10
3321 E2
3322 E4
3323 F2
3324 C8
3325 F12
3326 G12
3327 D10
3328 E9
3329 F10
3330 F11
3331 H11
3332 E8
3334 E7
3336 G9
3337 G10
3338 G7
3339 G8
3340 E10
3341 B8
3342 G2
3343 G2
3344 G2
3345 H2
3346 E1
3347 G6
3580 F4
4301 A5
5104 A2
5300 A8
5302 D8
6300 E4
7309 B9
7310 A3
7312-A C6
7312-B C9
7312-C B8
7312-D C11
7312-E C10
7312-F D10
7315 D1
7316 C9
7317 E3
7319 E3
7320-A G9
7320-B F9
7321 F2
7323 F11
7324 H11
9284 H4
9288 G4

11-11

2100 A10 2101 A11 2102 A9 2103 A9 2104 A2
2106 B11 2108 A5 2110 D8 2111 C3 2112 D10
2113 D8 2114 D9 2115 E13 2116 E11 2117 E13
2118 F10 2119 F2 2120 D1 2121 D4 2122 C10
2124 F10 2125 E1 2126 F7 2128 G10 2130 G10
2132 C4 2134 E13 2135 F3 2136 F10 2137 B7
3100 A2 3101 B10 3102 B2 3103 B10 3106 B11
3107 D7 3108 A2 3109 B9 3110 B5 3114 A5
3115 E5 3117 B6 3119 D8 3120 C3 3121 C3
3122 C4 3125 F3 3126 A1 3127 C2 3128 E12
3129 F10 3130 F10 3133 D7 3134 D6 3135 E9
3136 E11 3137 E12 3139 E2 3140 E3 3141 C10
3142 F7 3143 E5 3144 F2 3146 F5 3147 B1
3148 F2 3149 C9 3151 C9 3152 C9 3153 D9
3154 B7 3155 E11 4101 E12 4102 E12 5100 A10
5101 D11 5102 D12 5103 F10 6106 D8 6108 C4
6109 B7 6110 D10 6111 F7 6113 D4 6114 E8
7104 B11 7105-A C8 7105-B B8 7105-C B8 7105-D B8
7105-E B7 7105-F B6 7109 B10 7111 C9 7113 E9
7114 C8 7115 C4 7117 F11 7118-A F5 7118-B F6
7118-C F7 7118-D E8 7118-E F8 7118-F F8 7119 D7
7121 E10 7122-A E2 7122-B E3 7122-C E3 7122-D E4
7122-E A4 7122-F A5 7128 E5 7129 B2 7130 A3
7131 C2 9201 D12 9202 E12 9272 A1

4 COMBI BOARD

AMPLIFIER PART LEFT CHANNEL

3 +5V_AMP 4.2V 3108 4K7 — AMP_D 5

2 AMP_OFF — AMP ON = H = 4V, AMP OFF = L = 0V — 9272 — 3100 10K — 7130 BC847BW 0.7V 0V — 3126 10K — 10n 2104

7122-E 7122-F 3114 4K7 — SC_L 4 — 10n 2108 — 3110 100K

7122 = 74HCU04D

Amplifier ON-OFF Switch

3147 10K 0.5V — BC856B 7129 0V — 4K7 3102 — -44.4V

7131 BC846B -44.8V — 3127 10K — -45V

7115 BC817-25 -25V — +VL -37.5V — -36.8V — 6.3V = supply for 7118 — -VL -43.8V

3120 8K2 — 3121 8K2 — 2111 1u0 — GND_SHIELD — 22K 3122 — 6108 BZX384-C6V8 — 2132 1u — BAV99 6113 — 1u0 2121 — -VL2 -45V

Supply Low-Side Driver

MODULATOR

+5V_AMP 3 — 2120 1u — 3144 150K — 3148 18K — 3139 470R — 3 LNF — 2125 4n7 — B — 2.1V

7122-A 4.2V — 7122-B 2.1V — 7122-C 2.1V — 7122-D 2.1V — C D E F — 1.9V — 3140 1K2 — 2119 4n7 — 2135 470p — 3125 1K — LOZ 3 — 3149 4K7

7122 = 74HCU04D

Driver Stage + Levelshifter

+V1L — 3117 1K8 — G2 — 7105-F — 2137 33p — 6109 BAS316 — 3154 1K0 — 7105-E — 46.2V — -37.5V

7105 = 74LV14

+V1L 6.3V — 7105-D 9 14 8 — 7105-C 5 6 — 7105-B 3 4 — 7105-A 1 2 7 — -V1L

BC817-25 — 3151 100K — 7114 — +V1L — 2110 1u — 6.3V = supply for 7105 — BZX384-C6V8 6106 — 8V — 3119 22K — 20V — 3152 2K2 — 3153 2K2 — 6110 BAV99 3 — 2114 10u — 2113 1u0 — 6114 BAV99 3 — 1.2V — -V1L

Supply High-Side Driver

MBTA42 7119 — 3134 330R — 3107 1K5 — 3133 5K6

+VL — 7118-D 9 14 8 — 7118-E 11 10 — 7118-F 13 12 7 — -VL

7118 = 74LV14

G1 — 1K0 3143 — BC856B 7128 0.4V — 0V — 3115 1K — 7118-A -40.7V 1 2 — 7118-B 3 4 — 7118-C 5 6 — 3142 1K2 — 6111 BAS316 — 2126 100p — -VL — 3146 1K5 — -37.6V — -43.8V

Power Stage

+AMP_L — 5100 BEAD 100MHz — 2101 100n — 2100 100n — 2103 100n — 330u 2102

H2 — 7109 STP14NF12FP 45V — 2.5V — 3109 4R7 — 7111 BC807-25 — 3101 0R047 — 3103 1K0 — 2106 1n0 — BC856B 7104 — SC_L 4 — 3106 22K

2122 220p — 3141 22R — 12 220p — 3151 100K

H1 — 7121 STP14NF12FP — 3135 4R7 — 7113 BC807-25 — -45V — 45V — -VL2 — 3129 1K0 — MBTA42 7117 — 2136 100n 330u — 2124 — 3130 0R047 — 2118 1n0 — 5103 BEAD 100MHz — -AMP 1 — 100n 2128 — 100n 2130

3155 4K7 — 3136 4K7

I — J — K

Output Filter

5101 30uH — 2116 330n — 3128 10K — 3137 10K — 4101 — 4102 — 9201 5102 — 9202 HF2024 — 2134 220n — 2115 1n — 2117 1n — LS_L 5 — LS_L_neg 5

0Vdc

Power2003 100W Class D Combi-Amplifier Part left channel 2003 02 10

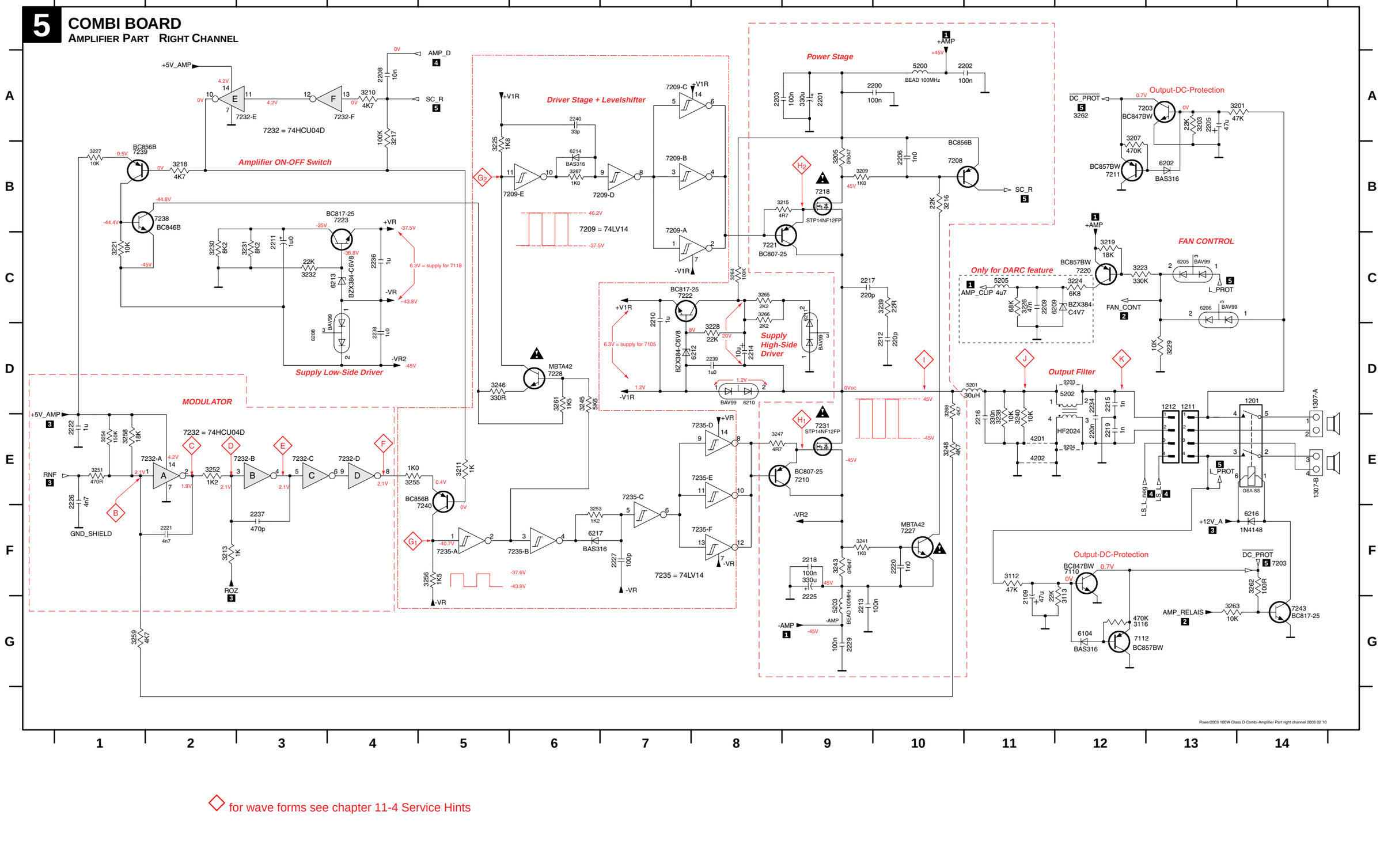
◇ for wave forms see chapter 11-4 Service Hints

11-12

1201 E14 1211 D13 1212 D13 1307-A D14 1307-B E14 2109 F11
2200 A10 2201 A9 2202 A11 2203 A8 2205 A13 2206 B10
2208 A4 2209 C11 2210 C7 2211 C3 2212 D10 2213 G9
2214 D8 2215 D12 2216 E11 2217 C9 2218 F9 2219 E12
2220 F10 2221 F2 2222 E1 2225 F9 2226 E1 2227 F7
2229 G9 2234 D12 2236 C4 2237 F3 2238 D4 2239 D8
2240 A6 3112 F11 3113 F12 3116 G12 3201 A14 3203 A13
3205 B9 3207 A12 3209 B9 3210 A4 3211 E5 3213 F2
3215 B9 3216 B10 3217 A4 3218 B2 3219 C12 3221 C1
3223 C12 3224 C12 3225 B5 3226 C11 3227 B1 3228 D8
3229 D13 3230 C2 3231 C3 3232 C3 3238 E11 3239 C10
3240 E11 3241 F9 3243 F9 3245 D6 3246 D5 3247 E8
3248 E10 3251 E1 3252 E2 3253 F6 3254 F1 3255 E4
3256 F5 3258 G1 3259 G1 3261 D6 3262 F14 3263 G13
3264 C8 3265 C8 3266 C8 3267 B6 3268 D10 4201 E11
4202 E11 5200 A10 5201 D11 5202 D12 5203 G9 5205 C11
6104 G12 6202 B13 6205 C13 6206 C13 6208 D3 6209 C12
6210 D8 6211 C9 6212 D8 6213 C4 6214 B6 6216 F14
6217 F6 7110 F12 7112 G12 7203 A13 7208 B10 7209-A C7
7209-B B7 7209-C A7 7209-D B6 7209-E B5 7209-F A7 7210 E9
7211 B12 7218 B9 7220 C12 7221 C8 7222 B4 7223 C4
7227 C4 7228 C6 7231 D6 7232-A E1 7232-B E2 7232-C E3
7232-D E4 7232-E A3 7232-F A4 7235-A F5 7235-B F5 7235-C E7
7235-D E8 7235-E E8 7235-F F8 7238 B2 7239 B2 7240 E5
7243 G14 9203 D12 9204 E12

5 COMBI BOARD

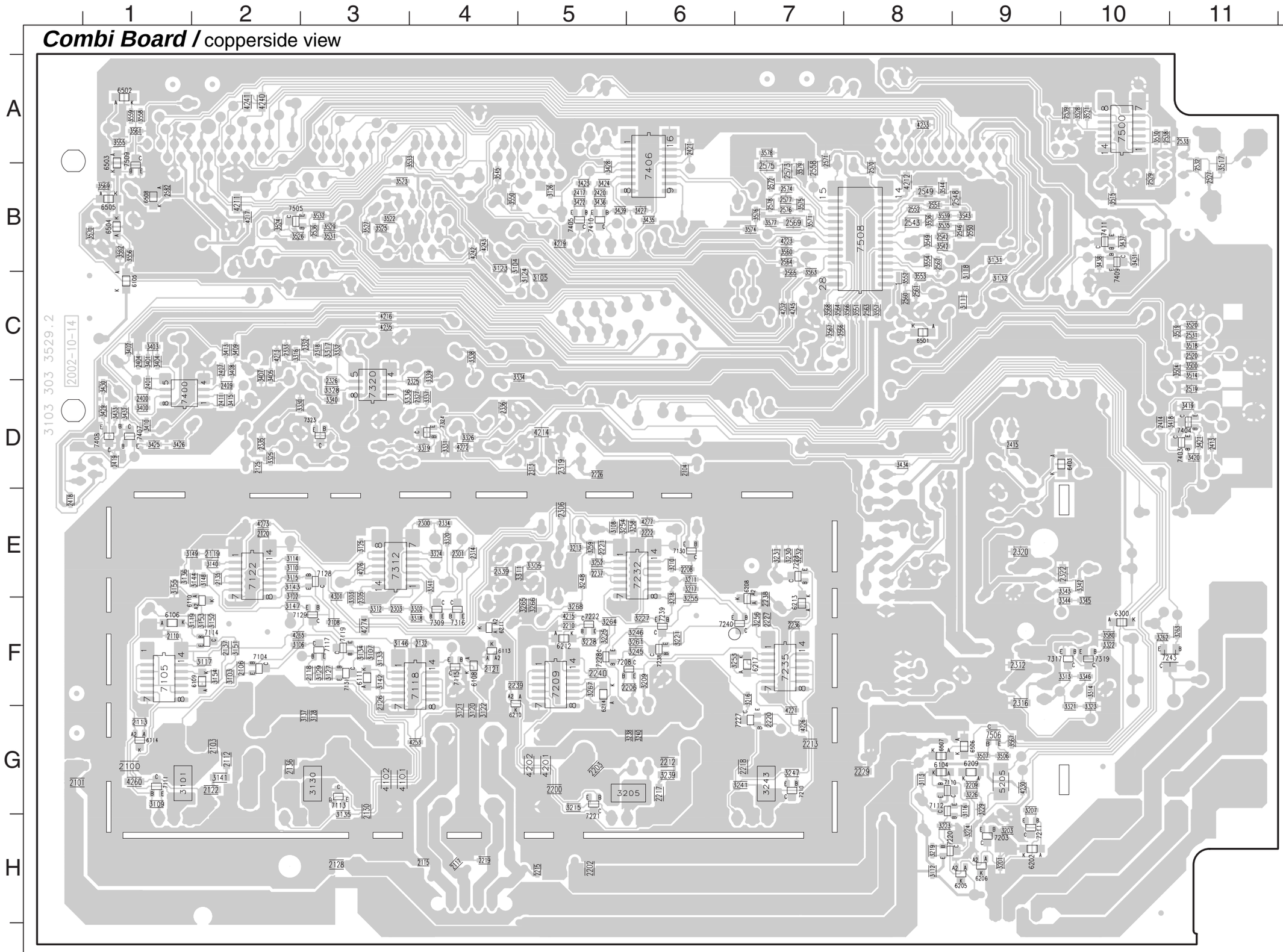
AMPLIFIER PART RIGHT CHANNEL



◇ for wave forms see chapter 11-4 Service Hints

11-13

Combi Board / copperside view



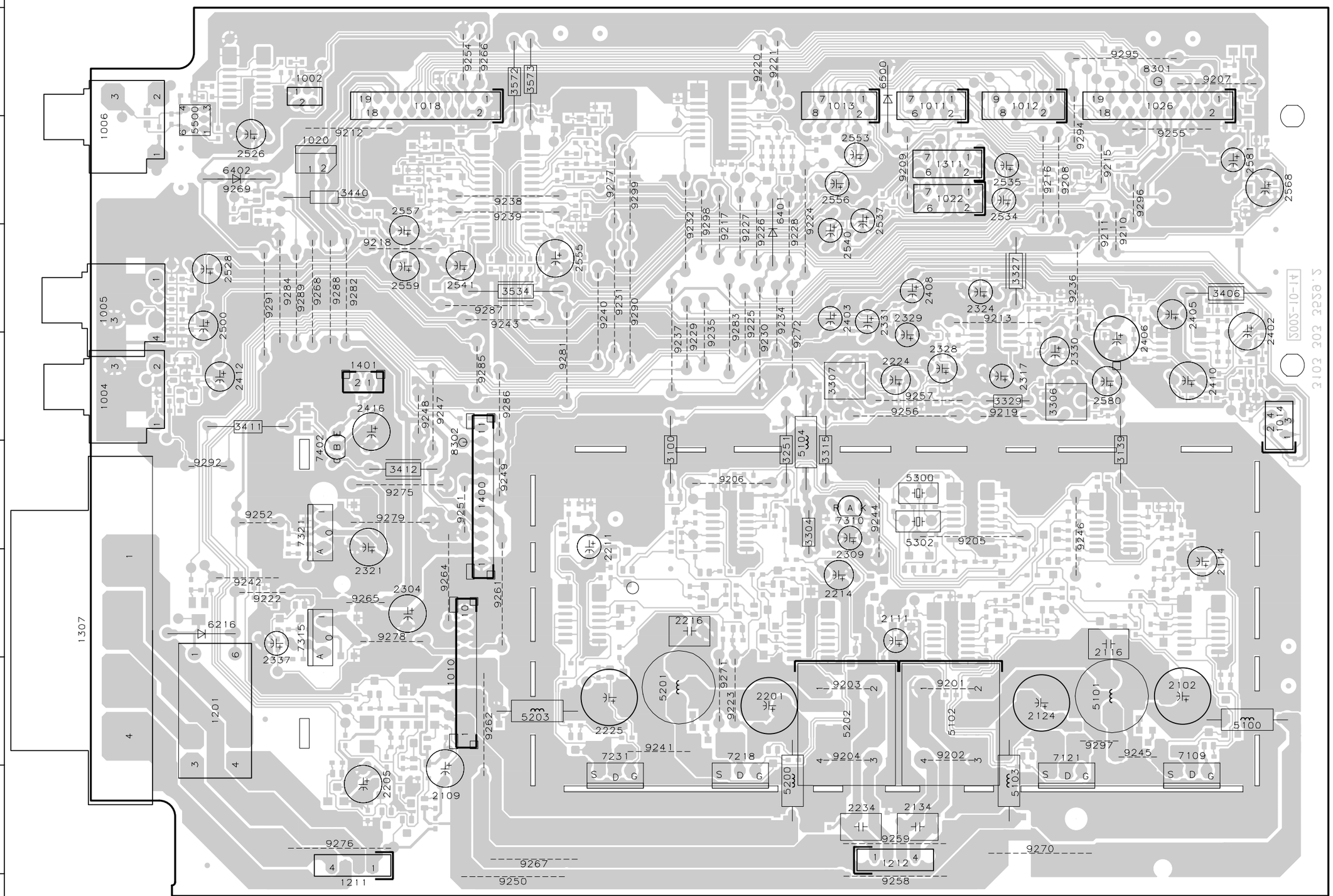
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

Power2003 100W Class D - Combi Board stage.2 2003 02 10

| | | |

11-14

Combi Board I componentside view



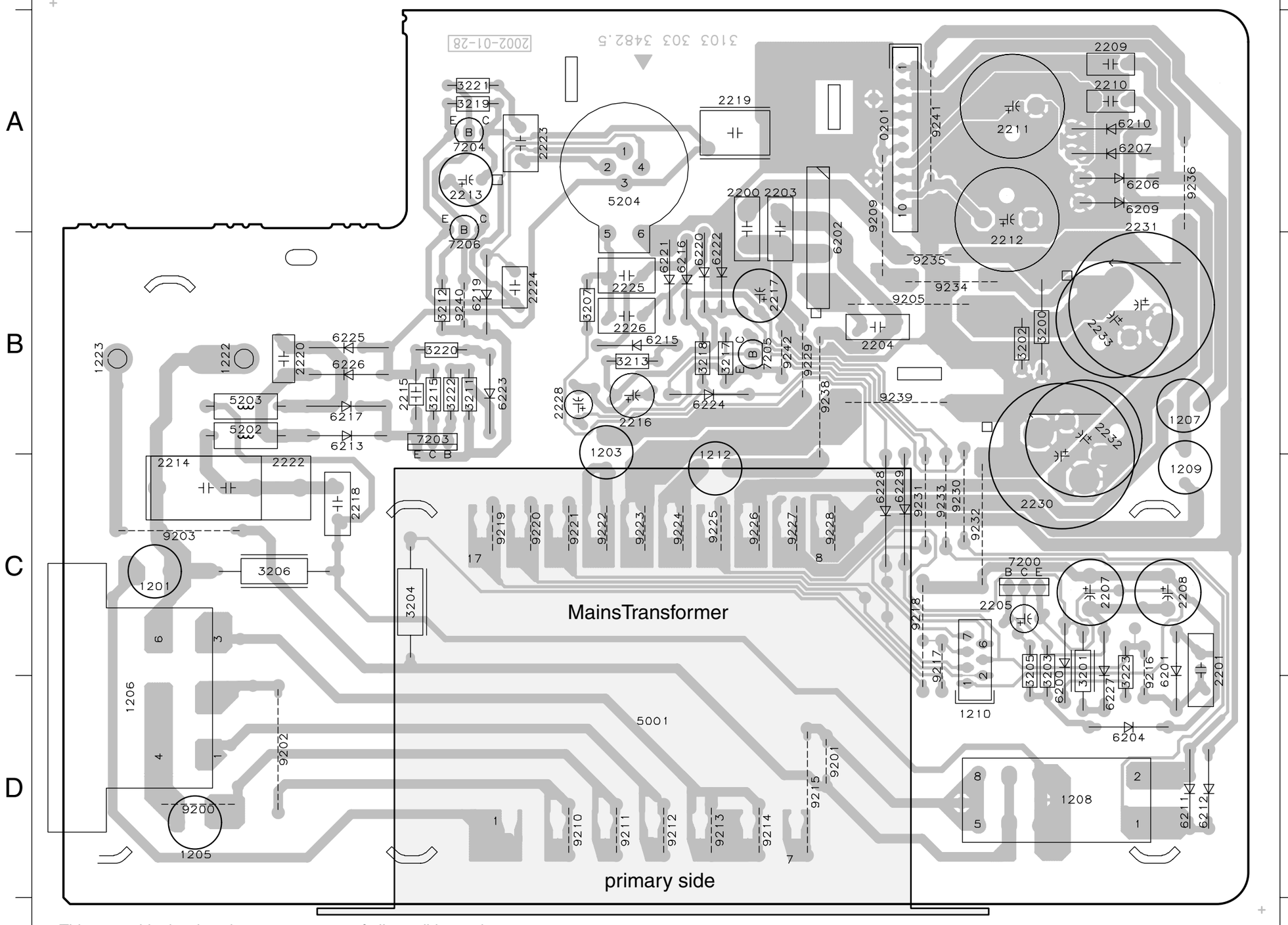
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram respectively partslist.

Power2003 100W Class D - Combi Board stage.2 2003 02 10

1002 A3
1004 D1
1005 C1
1006 B1
1010 G4
1011 A8
1012 A9
1013 A7
1014 D11
1018 A4
1020 B3
1022 B8
1026 A10
1201 G2
1211 H3
1212 H8
1307 F1
1311 B8
1400 E4
1401 D3
2102 G11
2109 H4
2111 F8
2114 F11
2116 F10
2124 G9
2134 H8
2201 G7
2205 H3
2211 F8
2214 F7
2216 F6
2224 D8
2225 G5
2234 H8
2304 F3
2309 F8
2317 D9
2321 F3
2324 C9
2328 D8
2329 D8
2330 D10
2331 C8
2337 C2
2402 C11
2403 C7
2405 C11
2406 D10
2408 C8
2410 D11
2412 D2
2416 D3
2500 C2
2526 B2
2528 B2
2534 B9
2535 B9
2537 B8
2540 C7
2541 C4
2553 B8
2555 C5
2556 B8
2557 B3
2559 C3
2568 B11
2580 D10
2581 B11
3100 E6
3139 E10
3251 E7
3304 E7
3306 D9
3307 D7
3315 E7
3327 C9
3329 D9
3406 C11
3411 D2
3412 E3
3440 B2
3534 C4
3572 A4
3573 A5
5100 G11
5101 G10
5102 G8
5103 H9
5104 E7
5200 H7
5201 G6
5202 G7
5203 G5
5300 E8
5302 E8
5500 B1
6216 F2
6401 B7
6402 B2
6500 A8
7109 G11
7121 G10
7218 G6
7231 G5
7310 E8
7315 F2
7321 E2
7402 E3
8301 A10
8302 E4
9201 G8
9202 G8
9203 G7
9204 G7
9205 E9
9206 E6
9207 A11
9208 B9
9209 B8
9210 C10
9211 C10
9212 B3
9213 C9
9215 B10
9216 B9
9217 C6
9218 C3
9219 D9
9220 A7
9221 A7
9222 F2
9223 G6
9224 B7
9225 C7
9226 C7
9227 C7
9228 C7
9229 D6
9230 D7
9231 C5
9232 C6
9234 C7
9235 D6
9236 C10
9237 D6
9238 B4
9239 B4
9240 C5
9241 G6
9242 F2
9243 C4
9244 E8
9245 G10
9246 E10
9247 D4
9248 D4
9249 E4
9250 H4
9251 E4
9252 E2
9254 A4
9255 B10
9256 D8
9257 D8
9258 H8
9259 H8
9261 F4
9262 G4
9264 F4
9265 F3
9266 A4
9267 H5
9268 C3
9269 B2
9270 H9
9271 G6
9272 D7
9275 E3
9276 H3
9277 B5
9278 F3
9279 E3
9281 D5
9282 C3
9283 C6
9284 C2
9285 D4
9286 D4
9287 C4
9288 C3
9289 C2
9290 C6
9291 C2
9292 E2
9294 B10
9295 A10
9296 B10
9297 G10
9298 B6
9299 B6

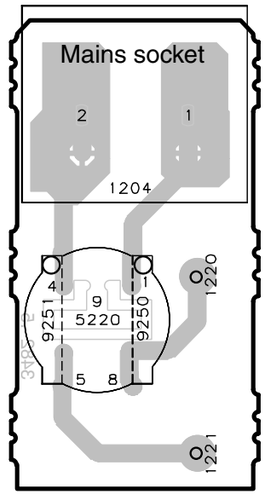
11-15

Mains Board I copperside view



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

Power2002 70W Class D - Mains Board stage.5 2003 02 10



0201 A4
1201 C1
1203 B3
1205 D1
1206 D1
1207 B5
1208 D5
1209 C5
1210 C5
1212 C4
1222 B1
1223 B1
2200 A4
2201 D5
2203 A4
2204 B4
2205 C5
2207 C5
2208 C5
2209 A5
2210 A5
2211 A5
2212 A4
2213 A2
2214 B1
2215 B2
2216 B3
2217 B4
2218 C2
2219 A4
2220 B1
2222 C1
2223 A3
2224 B3
2225 B3
2226 B3
2228 B3
2230 C5
2231 B5
2232 B5
2233 B5
3200 B5
3201 D5
3202 B5
3203 D5
3204 C2
3205 D5
3206 C1
3207 B3
3211 B2
3212 B2
3213 B3
3215 B2
3217 B4
3218 B3
3219 A3
3220 B2
3221 A2
3222 B2
3223 C5
5001 C3
5202 B1
5203 B1
5204 A3
6200 D5
6201 D5
6202 B4
6204 D5
6206 A5
6207 A5
6209 A5
6210 A5
6211 D5
6212 D5
6213 B2
6215 B3
6216 B3
6217 B2
6219 B2
6220 A3
6221 B3
6222 A3
6223 B2
6224 B3
6225 B2
6226 B2
6227 C5
6228 C4
6229 C4
7200 C5
7203 C2
7204 A2
7205 B4
7206 A2
9200 D1
9201 D4
9202 D1
9203 C1
9205 B4
9209 A4
9210 D3
9211 D3
9212 D3
9213 D3
9214 D4
9215 D4
9216 C5
9217 C4
9218 C4
9219 C2
9220 C3
9221 C3
9222 C3
9223 C3
9224 C3
9225 C4
9226 C4
9227 C4
9228 C4
9229 B4
9230 C5
9231 C4
9232 C5
9233 C5
9234 B5
9235 B4
9236 A5
9238 B4
9239 B4
9240 B2
9241 A4
9242 B4

11-16

0201 D10 1201 A3 1203 A5 1205 A3 1206 A3
1207 B5 1208 C3 1209 C5 1210 C10 1212 B5
1222 A2 1223 A2 2200 A6 2201 C8 2203 A6
2204 A6 2205 A10 2207 B8 2208 B9 2209 C6
2210 C7 2211 C7 2212 B7 2213 D4 2214 D1
2215 D5 2216 E8 2217 E9 2218 E1 2219 E7
2220 E1 2222 D1 2223 D6 2224 E6 2225 C8
2226 D7 2228 C1 2230 A7 2231 B7 2232 A7
2233 A7 3200 A8 3201 B8 3202 A8 3203 B9
3204 A2 3205 B9 3206 B2 3207 C8 3211 D4
3212 D5 3213 D8 3215 E3 3217 C2 3218 B1
3219 E6 3220 E4 3221 D6 3222 E3 3223 B8
5001 A4 5202 E1 5203 E1 5204 D7 6200 B8
6201 C9 6202 A6 6204 B9 6206 C6 6207 C7
6209 C6 6210 C7 6211 C3 6212 C3 6213 D2
6215 D8 6216 D9 6217 D2 6219 D6 6220 D8
6221 E8 6222 E8 6223 E3 6224 C1 6225 E2
6226 E2 6227 B8 6228 C1 6229 C8 6232 C8
7200 A9 7203 D3 7204 E5 7205 B2 7206 D5
9200 A3 9201 B3

MAINS BOARD / P2003 100W CLASS D

1204 5220 97TS 1221 1222 1220 1223
1201 T1A6 IEC T4A UL T1A25 NON ECO
1206 SDKP /21 ONLY
3204 10M /37 ONLY
NOT /21 9200
1205 T1A6 /21 ONLY T1A25 NON ECO
MAINS_2 3206 10M
MAINS_1
9201
5001 2000TS-092
NTC DISPLAY F1 F2 T.F
1203 T5A 19372
1212 T5A 19372
GBU8D 6202
2200 100n 2203 100n 2204 100n
2230 4m7 2232 3300u 3200 33K 45V +AMP
2231 4m7 2233 3300u 3202 33K -45V -AMP
1207 T2A 19372
1209 T2A 19372
2209 100n 6206 1N5392 6207 1N5392
6209 1N5392 6210 1N5392 2210 100n 2211 3m3 22.9V +D
2212 6m8 10.9V +D2
3201 4R7 6227 1N4003
6200 1N4148 3223 4K7
6229 1N4148 3207 4K7
5.3V PWR_DWN
2207 100u 2208 100u
4n7 2201 6201 BZX79-F8V2
7200 BD438 -46V -34V -33.4V -Vkk
3203 3K9 3205 680R 6204 BZX79-C33 2205 0u47
3218 10K 7205 BC337-40 BZX79-B2V7 6224 0V 0.7V 4.7V LOW_PWR_CTRL 0V
2228 22u 6228 1N4148 2K2 3217
+D2 6212 1N4148 OZ 1208 10.2V 12V_RELAIS 6211 1N4148 MAINS_2
1210 FROM / TO COMBI BOARD 1011
5V6_ECO 5.6V
LOW_PWR_CTRL
NTC
PWR_DWN 5.3V
F2
F1
-Vkk -33.4V
0201 TO COMBI BOARD 1010
+AMP +45V
+AMP +45V
-AMP -45V
-AMP -45V
+D 22.9V
+D2 10.9V
1N4003 6213 1N4003 6217
MAINS_1
2214 220n 2222 470n
5202 1mH 2220 47n
2218 22n 41V
5203 1mH MAINS_2
6225 1N4003 6226 1N4003
7203 BD438 3222 680R 3215 100R 6223 BZX79-C39 3220 330R
3211 330R 38V
2213 100u 3212 4M7
3221 330R 2223 100n
7206 BC547B 2215 100n 1N4148 6219
BC557B 7204 19V
2224 10n 3219 100K
STANDBY 5204 3A1631N
2226 100n 2225 100n 12V_RELAIS 13.3V
1N4148 6215 1N4148 6216
3213 470R 5V6_ECO 5.6V
1N4148 6220 1N4148 6221
2216 10u BZX79-C5V6 6222 2217 220u
2219 2n2
xxV PLAY MODE
xxV ECO STANDBY MODE
xxV measured with a " not grounded multimeter "

ELECTRICAL PARTSLIST *POWER 2003 100W Class-D MAINS BOARD*

MISCELLANEOUS

1201 ⚠	4822 071 51602	FUSE 1,6A	
1201 ⚠	4822 253 10126	FUSE T4A	
1203 ⚠	4822 071 55002	FUSE T5A	
1204 ⚠	2422 030 00328	MAINS SOCKET /37	
1204 ⚠	4822 265 31015	MAINS SOCKET, IEC	
1205 ⚠	4822 071 51602	FUSE 1,6A	
1206 ⚠	2422 129 16478	VOLTAGE SELECTOR	
1207 ⚠	9965 000 07788	FUSE RAD T2A	
1208 ⚠	2422 132 07519	RELAY 1P 12V 16A	
1209 ⚠	9965 000 07788	FUSE RAD T2A	
1210	4822 267 10953	FFC-CONNECTOR, 7P, TOP ENTRY	
1212 ⚠	4822 071 55002	FUSE T5A	
5001 ⚠	3103 308 30920	Mains Transformer /37	
5001 ⚠	3103 308 30910	Mains Transformer /22	
5001 ⚠	3103 308 30900	Mains Transformer /21, /21M	
5204 ⚠	2422 549 45157	STANDBY TRANSFORMER	

CAPACITORS

2200	4822 121 43696	100nF	10%	100V
2201	4822 122 31125	4,7nF	10%	63V
2203	4822 121 43696	100nF	10%	100V
2204	4822 121 43696	100nF	10%	100V
2205	5322 124 41948	0,47µF	20%	50V
2208	2020 012 93547	100µF	20%	63V
2209	5322 121 42386	100nF	5%	63V
2210	5322 121 42386	100nF	5%	63V
2211	4822 124 42367	3300µF	20%	35V
2212	4822 124 12328	6800µF	20%	16V
2213	4822 124 40255	100µF	20%	50V
2214 ⚠	4822 121 10512	220nF	20%	275V
2215	5322 121 42386	100nF	5%	63V
2216	4822 124 21732	10µF	20%	25V
2217	4822 124 80144	220µF	20%	25V
2218	4822 121 41856	22nF	5%	250V
2219 ⚠	4822 126 14088	2,2nF	20%	250V
2220	4822 121 43526	47nF	5%	100V
2222 ⚠	4822 126 13589	470nF	10%	275V
2223	5322 121 42386	100nF	5%	63V
2224	4822 122 30043	10nF	80%	63V
2225	5322 121 42386	100nF	5%	63V
2226	5322 121 42386	100nF	5%	63V
2228 ©	4822 124 11946	22µF	20%	16V
2232	2022 020 00644	3300µF	20%	50V
2233	2022 020 00644	3300µF	20%	50V

RESISTORS

3200	4822 050 23303	33kΩ	1%	0,6W
3201 ⚠	4822 052 10478	4,7Ω	5%	NFR25
3202	4822 050 23303	33kΩ	1%	0,6W
3203	4822 116 52276	3,9kΩ	5%	0,5W
3204 ⚠	4822 053 21106	10MΩ	5%	0,5W
3205	4822 116 52228	680Ω	5%	0,5W
3206 ⚠	4822 053 21106	10MΩ	5%	0,5W
3207	4822 116 52283	4,7kΩ	5%	0,5W
3211	4822 116 52219	330Ω	5%	0,5W
3212	4822 111 30893	4,7MΩ	5%	0,2W
3213	4822 116 83883	470Ω	5%	0,16W
3215	4822 116 52175	100Ω	5%	0,5W
3217	4822 116 52256	2,2kΩ	5%	0,16W
3218	4822 050 21003	10kΩ	2%	0,25W
3219	4822 116 52234	100kΩ	5%	0,5W
3220	4822 116 52219	330Ω	5%	0,5W
3221	4822 116 52219	330Ω	5%	0,5W
3222	4822 116 52228	680Ω	5%	0,5W
3223	4822 116 52283	4,7kΩ	5%	0,5W

COILS

5202	4822 157 53473	1000µH
5203	4822 157 53473	1000µH
5220 ⚠	4822 157 11832	400µH Mains filter

DIODES

6200	4822 130 30621	1N4148
6201	4822 130 34382	BZX79-B8V2
6202	4822 130 11139	GBU8D
6204	4822 130 34142	BZX79-B33
6206	4822 130 31878	1N4003G
6207	4822 130 31878	1N4003G
6209	4822 130 31878	1N4003G
6210	4822 130 31878	1N4003G
6211	4822 130 30621	1N4148
6212	4822 130 30621	1N4148
6213	4822 130 31878	1N4003G
6215	4822 130 30621	1N4148
6216	4822 130 30621	1N4148
6217	4822 130 31878	1N4003G
6219	4822 130 30621	1N4148
6220	4822 130 31983	BAT85
6221	4822 130 31983	BAT85
6223	4822 130 34145	BZX79-B39
6224	5322 130 34563	BZX79-C2V7
6225	4822 130 31878	1N4003G
6226	4822 130 31878	1N4003G
6227	4822 130 31878	1N4003G
6228	4822 130 30621	1N4148
6229	4822 130 30621	1N4148

TRANSISTORS

7200	4822 130 40995	BD438
7203	4822 130 40995	BD438
7204	4822 130 44568	BC557B
7205	4822 130 40855	BC337-40
7206	4822 130 40959	BC547B

ELECTRICAL PARTSLIST *POWER 2003 100W Class-D COMBI BOARD*

MECHANICAL PARTS

0021	4822 492 11735	SPRING TRANSISTOR

MISCELLANEOUS

1005	2422 026 05418	SOCKET, CINCH, 2p
1011	4822 267 10953	FFC-CONNECTOR, 7P, TOP ENTRY
1012	2422 025 14518	FFC-CONNECTOR, 9P, TOP ENTRY
1013	4822 265 11515	FFC-CONNECTOR, 8P, TOP ENTRY
1014	4822 267 10733	FFC SOCKET, 4P
1018	4822 265 10981	FFC-CONNECTOR, 15P, TOP ENTRY
1022	4822 267 10953	FFC-CONNECTOR, 7P, TOP ENTRY
1026	4822 265 11553	FLEX FOIL CONNECTOR 19P
1201	2422 132 07517	RELAY 2P 12V
1307	2422 015 19893	SOCKET, CLICKFIT, 4P

CAPACITORS

2100 ©	4822 122 33496	100nF	10%	63V
2101 ©	2222 580 15649	100nF	10%	50V
2102	2020 012 93762	330µF	20%	50V
2103 ©	2222 580 15649	100nF	10%	50V
2104 ©	5322 126 11583	10nF	10%	63V
2106 ©	5322 126 11578	1nF	10%	63V
2108 ©	5322 126 11583	10nF	10%	63V
2109	4822 124 81286	47µF	20%	16V
2110 ©	3198 017 41050	1µF	20%	10V
2111	4822 124 22651	1µF	20%	50V
2112 ©	4822 122 33575	220pF	5%	50V
2113 ©	3198 017 41050	1µF	20%	10V
2114	4822 124 40248	10µF	20%	63V
2115 ©	5322 126 11578	1nF	10%	63V
2116	5322 121 42661	330nF	5%	63V
2117 ©	5322 126 11578	1nF	10%	63V
2118 ©	5322 126 11578	1nF	10%	63V
2119 ©	4822 126 13193	4,7nF	10%	63V
2120 ©	3198 017 41050	1µF	20%	10V
2121 ©	3198 017 41050	1µF	20%	10V
2122 ©	4822 122 33575	220pF	5%	50V
2124	2020 012 93762	330µF	20%	50V
2125 ©	4822 126 13193	4,7nF	10%	63V
2126 ©	2020 552 94427	100pF	5%	50V
2128 ©	2222 580 15649	100nF	10%	50V
2130 ©	2222 580 15649	100nF	10%	50V
2132 ©	3198 017 41050	1µF	20%	10V
2134	4822 121 42408	220nF	5%	63V
2135 ©	4822 126 13881	470pF	5%	50V
2136 ©	2222 580 15649	100nF	10%	50V
2137 ©	2222 867 15339	33pF	5%	50V
2200 ©	2222 580 15649	100nF	10%	50V
2201	2020 012 93762	330µF	20%	50V
2202 ©	2222 580 15649	100nF	10%	50V
2203 ©	2222 580 15649	100nF	10%	50V
2205	4822 124 81286	47µF	20%	16V
2206 ©	5322 126 11578	1nF	10%	63V
2208 ©	5322 126 11583	10nF	10%	63V
2210 ©	3198 017 41050	1µF	20%	10V
2211	4822 124 22651	1µF	20%	50V
2212 ©	4822 122 33575	220pF	5%	50V
2213 ©	2222 580 15649	100nF	10%	50V
2214	4822 124 40248	10µF	20%	63V
2215 ©	5322 126 11578	1nF	10%	63V
2216	5322 121 42661	330nF	5%	63V
2217 ©	4822 122 33575	220pF	5%	50V
2218 ©	2222 580 15649	100nF	10%	50V

CAPACITORS

2219 ©	5322 126 11578	1nF	10%	63V
2220 ©	5322 126 11578	1nF	10%	63V
2221 ©	4822 126 13193	4,7nF	10%	63V
2222 ©	3198 017 41050	1µF	20%	10V
2224	4822 124 81151	22µF	20%	50V
2225	2020 012 93762	330µF	20%	50V
2226 ©	4822 126 13193	4,7nF	10%	63V
2227 ©	2020 552 94427	100pF	5%	50V
2229 ©	2222 580 15649	100nF	10%	50V
2234	4822 121 42408	220nF	5%	63V
2236 ©	3198 017 41050	1µF	20%	10V
2237 ©	4822 126 13881	470pF	5%	50V
2238 ©	3198 017 41050	1µF	20%	10V
2239 ©	3198 017 41050	1µF	20%	10V
2240 ©	2222 867 15339	33pF	5%	50V
2300 ©	4822 126 13883	220pF	5%	50V
2301 ©	4822 126 13883	220pF	5%	50V
2303 ©	4822 126 13881	470pF	5%	50V
2304	4822 124 81286	47µF	20%	16V
2305 ©	3198 017 41050	1µF	20%	10V
2306 ©	4822 126 14585	100nF	10%	50V
2309	4822 124 11947	10µF	20%	16V
2312 ©	2222 580 15649	100nF	10%	50V
2313 ©	3198 016 31020	1nF	5%	25V
2314 ©	4822 126 13883	220pF	5%	50V
2316 ©	4822 126 14585	100nF	10%	50V
2317	4822 124 21732	10µF	20%	25V
2318 ©	4822 126 13881	470pF	5%	50V
2319 ©	4822 126 14585	100nF	10%	50V
2320 ©	4822 126 14585	100nF	10%	50V
2321	4822 124 81286	47µF	20%	16V
2322 ©	4822 126 14585	100nF	10%	50V
2324	4822 124 22726	4,7µF	20%	35V
2325 ©	4822 126 13881	470pF	5%	50V
2326 ©	2020 552 94427	100pF	5%	50V
2327 ©	2020 552 94427	100pF	5%	50V
2328	4822 124 81151	22µF	20%	50V
2329	4822 124 22726	4,7µF	20%	35V
2330	4822 124 81151	22µF	20%	50V
2331	4822 124 22726	4,7µF	20%	35V
2332 ©	2020 552 94427	100pF	5%	50V
2333 ©	2020 552 94427	100pF	5%	50V
2334 ©	2222 867 15339	33pF	5%	50V
2335 ©	2238 586 59812	100nF	10%	50V
2336 ©	2238 586 59812	100nF	10%	50V
2337	4822 124 21732	10µF	20%	25V
2339 ©	3198 017 41050	1µF	20%	10V
2400 ©	2020 552 94427	100pF	5%	50V
2401 ©	4822 126 13881	470pF	5%	50V
2402	4822 124 23052	100µF	20%	16V
2403	4822 124 22651	1µF	20%	50V
2404 ©	2020 552 94427	100pF	5%	50V
2405	4822 124 12032	4,7µF	20%	50V
2406	4822 124 80791	470µF	20%	16V
2407 ©	2020 552 94427	100pF	5%	50V
2408	4822 124 22651	1µF	20%	50V
2409 ©	4822 126 13881	470pF	5%	50V
2410	4822 124 23052	100µF	20%	16V
2411 ©	2020 552 94427	100pF	5%	50V
2415 ©	3198 017 41050	1µF	20%	10V
2416	4822 124 23052	100µF	20%	16V
2417 ©	3198 017 41050	1µF	20%	10V

ELECTRICAL PARTSLIST *POWER 2003 100W Class-D COMBI BOARD*

CAPACITORS

2418 ©	2020 552 94427	100pF	5%	50V	
2419 ©	2020 552 94427	100pF	5%	50V	
2420 ©	3198 017 41050	1µF	20%	10V	
2421 ©	2238 586 59812	100nF	10%	50V	
2500	2022 020 00734	1µF	20%	50V	
2519 ©	2238 586 59812	100nF	10%	50V	
2520 ©	4822 126 13881	470pF	5%	50V	
2528	2022 020 00734	1µF	20%	50V	
2531 ©	4822 126 13881	470pF	5%	50V	
2534	4822 124 40769	4,7µF	20%	100V	
2535	4822 124 40769	4,7µF	20%	100V	
2536 ©	2238 586 59812	100nF	10%	50V	
2537	2022 020 00734	1µF	20%	50V	
2540	2022 020 00734	1µF	20%	50V	
2541	4822 124 81151	22µF	20%	50V	
2542 ©	3198 016 31020	1nF	5%	25V	
2543 ©	2020 552 96684	470nF	10%	25V	
2546 ©	4822 126 14549	33nF	10%	16V	
2548 ©	2020 552 96327	330nF	10%	16V	
2549 ©	2020 552 96684	470nF	10%	25V	
2550 ©	5322 126 11579	3,3nF	10%	63V	
2551 ©	4822 126 13879	220nF	20%	16V	
2552 ©	4822 126 13193	4,7nF	10%	63V	
2553	4822 124 22651	1µF	20%	50V	
2555	4822 124 81286	47µF	20%	16V	
2556	4822 124 22651	1µF	20%	50V	
2557	2022 020 00734	1µF	20%	50V	
2558 ©	2020 552 96684	470nF	10%	25V	
2559	2022 020 00734	1µF	20%	50V	
2560 ©	4822 126 13881	470pF	5%	50V	
2561 ©	4822 126 13881	470pF	5%	50V	
2562 ©	4822 126 13881	470pF	5%	50V	
2563 ©	4822 126 13881	470pF	5%	50V	
2564 ©	4822 126 13881	470pF	5%	50V	
2565 ©	4822 126 13881	470pF	5%	50V	
2566 ©	4822 126 13881	470pF	5%	50V	
2567 ©	4822 126 13881	470pF	5%	50V	
2568	4822 124 12233	47µF	20%	25V	
2569 ©	2020 552 96684	470nF	10%	25V	
2570 ©	2020 552 94427	100pF	5%	50V	
2571 ©	2020 552 94427	100pF	5%	50V	
2572 ©	4822 126 13879	220nF	20%	16V	
2573 ©	2020 552 96684	470nF	10%	25V	
2574 ©	4822 126 13193	4,7nF	10%	63V	
2575 ©	2020 552 96327	330nF	10%	16V	
2576 ©	3198 016 31020	1nF	5%	25V	
2577 ©	4822 126 14549	33nF	10%	16V	
2578 ©	5322 126 11579	3,3nF	10%	63V	
2580	4822 124 81151	22µF	20%	50V	
2581	4822 124 22651	1µF	20%	50V	
2582 ©	2238 586 59812	100nF	10%	50V	

RESISTORS

3100	4822 050 21003	10kΩ	2%	0,25W
3101 ©	2122 118 06235	CHIP JUMPER 2512		
3102 ©	4822 051 30472	4,7kΩ	5%	0,06W
3103 ©	4822 051 30102	1kΩ	5%	0,06W
3106 ©	4822 051 30223	22kΩ	5%	0,06W
3107 ©	4822 051 30152	1,5kΩ	5%	0,06W
3108 ©	4822 051 30472	4,7kΩ	5%	0,06W
3109 ©	4822 117 13608	4,7Ω	5%	0,06W
3110 ©	4822 117 13632	100kΩ	1%	0,06W

RESISTORS

3111 ©	4822 051 30682	6,8kΩ	5%	0,06W
3112 ©	4822 117 12925	47kΩ	1%	0,06W
3113 ©	4822 051 30223	22kΩ	5%	0,06W
3114 ©	4822 051 30472	4,7kΩ	5%	0,06W
3115 ©	4822 051 30102	1kΩ	5%	0,06W
3116 ©	4822 051 30474	470kΩ	5%	0,06W
3117 ©	4822 117 12903	1,8kΩ	1%	0,06W
3118 ©	4822 051 30682	6,8kΩ	5%	0,06W
3119 ©	4822 051 30103	10kΩ	5%	0,06W
3120 ©	4822 117 12902	8,2kΩ	1%	0,06W
3121 ©	4822 117 12902	8,2kΩ	1%	0,06W
3122 ©	4822 051 30223	22kΩ	5%	0,06W
3123 ©	4822 051 30472	4,7kΩ	5%	0,06W
3124 ©	4822 051 30472	4,7kΩ	5%	0,06W
3125 ©	4822 051 30102	1kΩ	5%	0,06W
3126 ©	4822 051 30103	10kΩ	5%	0,06W
3127 ©	4822 051 30103	10kΩ	5%	0,06W
3128 ©	4822 051 30103	10kΩ	5%	0,06W
3129 ©	4822 051 30102	1kΩ	5%	0,06W
3130 ©	2122 118 06235	CHIP JUMPER 2512		
3131 ©	4822 051 30222	2,2kΩ	5%	0,06W
3132 ©	4822 051 30222	2,2kΩ	5%	0,06W
3133 ©	4822 051 30562	5,6kΩ	5%	0,06W
3134 ©	4822 051 30331	330Ω	5%	0,06W
3135 ©	4822 117 13608	4,7Ω	5%	0,06W
3136 ©	4822 051 30472	4,7kΩ	5%	0,06W
3137 ©	4822 051 30103	10kΩ	5%	0,06W
3139	4822 116 83883	470Ω	5%	0,16W
3140 ©	4822 117 11817	1,2kΩ	1%	0,06W
3141 ©	4822 117 12139	22Ω	5%	0,06W
3142 ©	4822 117 11817	1,2kΩ	1%	0,06W
3143 ©	4822 051 30102	1kΩ	5%	0,06W
3144 ©	4822 051 30154	150kΩ	5%	0,06W
3146 ©	4822 051 30152	1,5kΩ	5%	0,06W
3147 ©	4822 051 30103	10kΩ	5%	0,06W
3148 ©	4822 051 30183	18kΩ	5%	0,06W
3149 ©	4822 051 30472	4,7kΩ	5%	0,06W
3151 ©	4822 117 13632	100kΩ	1%	0,06W
3152 ©	4822 051 30222	2,2kΩ	5%	0,06W
3153 ©	4822 051 30222	2,2kΩ	5%	0,06W
3154 ©	4822 051 30102	1kΩ	5%	0,06W
3155 ©	4822 051 30472	4,7kΩ	5%	0,06W
3201 ©	4822 117 12925	47kΩ	1%	0,06W
3203 ©	4822 051 30223	22kΩ	5%	0,06W
3205 ©	2122 118 06235	CHIP JUMPER 2512		
3207 ©	4822 051 30474	470kΩ	5%	0,06W
3209 ©	4822 051 30102	1kΩ	5%	0,06W
3210 ©	4822 051 30472	4,7kΩ	5%	0,06W
3211 ©	4822 051 30102	1kΩ	5%	0,06W
3213 ©	4822 051 30102	1kΩ	5%	0,06W
3215 ©	4822 117 13608	4,7Ω	5%	0,06W
3216 ©	4822 051 30223	22kΩ	5%	0,06W
3217 ©	4822 117 13632	100kΩ	1%	0,06W
3218 ©	4822 051 30472	4,7kΩ	5%	0,06W
3221 ©	4822 051 30103	10kΩ	5%	0,06W
3225 ©	4822 117 12903	1,8kΩ	1%	0,06W
3227 ©	4822 051 30103	10kΩ	5%	0,06W
3228 ©	4822 051 30103	10kΩ	5%	0,06W
3229 ©	4822 051 30103	10kΩ	5%	0,06W
3230 ©	4822 117 12902	8,2kΩ	1%	0,06W
3231 ©	4822 117 12902	8,2kΩ	1%	0,06W
3232 ©	4822 051 30223	22kΩ	5%	0,06W

ELECTRICAL PARTSLIST *POWER 2003 100W Class-D COMBI BOARD*

RESISTORS

3238 ©	4822 051 30103	10kΩ	5%	0,06W	
3239 ©	4822 117 12139	22Ω	5%	0,06W	
3240 ©	4822 051 30103	10kΩ	5%	0,06W	
3241 ©	4822 051 30102	1kΩ	5%	0,06W	
3243 ©	2122 118 06235	CHIP JUMPER 2512			
3245 ©	4822 051 30562	5,6kΩ	5%	0,06W	
3246 ©	4822 051 30331	330Ω	5%	0,06W	
3247 ©	4822 117 13608	4,7Ω	5%	0,06W	
3248 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3251	4822 116 83883	470Ω	5%	0,16W	
3252 ©	4822 117 11817	1,2kΩ	1%	0,06W	
3253 ©	4822 117 11817	1,2kΩ	1%	0,06W	
3254 ©	4822 051 30154	150kΩ	5%	0,06W	
3255 ©	4822 051 30102	1kΩ	5%	0,06W	
3256 ©	4822 051 30152	1,5kΩ	5%	0,06W	
3258 ©	4822 051 30183	18kΩ	5%	0,06W	
3259 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3261 ©	4822 051 30152	1,5kΩ	5%	0,06W	
3262 ©	4822 051 30101	100Ω	5%	0,06W	
3263 ©	4822 051 30103	10kΩ	5%	0,06W	
3264 ©	4822 117 13632	100kΩ	1%	0,06W	
3265 ©	4822 051 30222	2,2kΩ	5%	0,06W	
3266 ©	4822 051 30222	2,2kΩ	5%	0,06W	
3267 ©	4822 051 30102	1kΩ	5%	0,06W	
3268 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3302 ©	4822 117 13632	100kΩ	1%	0,06W	
3303 ©	4822 051 30103	10kΩ	5%	0,06W	
3304	4822 116 52186	22Ω	5%	0,5W	
3305 ©	4822 051 30682	6,8kΩ	5%	0,06W	
3306	4822 101 11778	Potmeter 47kΩ		0,1W	
3307	4822 101 11778	Potmeter 47kΩ		0,1W	
3311 ©	4822 051 30103	10kΩ	5%	0,06W	
3312 ©	4822 117 13632	100kΩ	1%	0,06W	
3313 ©	4822 051 30221	220Ω	5%	0,06W	
3314 ©	4822 117 12925	47kΩ	1%	0,06W	
3315	4822 050 11002	1kΩ	5%	0,2W	
3316 ©	4822 051 30273	27kΩ	5%	0,06W	
3317 ©	4822 051 30333	33kΩ	5%	0,06W	
3318 ©	4822 117 13632	100kΩ	1%	0,06W	
3319 ©	4822 051 30222	2,2kΩ	5%	0,06W	
3320 ©	4822 051 30103	10kΩ	5%	0,06W	
3321 ©	4822 051 30102	1kΩ	5%	0,06W	
3322 ©	4822 051 30103	10kΩ	5%	0,06W	
3323 ©	4822 117 12968	820Ω	5%	0,06W	
3324 ©	4822 051 30105	1MΩ	5%	0,06W	
3325 ©	4822 051 30154	150kΩ	5%	0,06W	
3326 ©	4822 051 30154	150kΩ	5%	0,06W	
3327	4822 052 10339	33Ω	5%	NFR	
3328 ©	4822 117 12902	8,2kΩ	1%	0,06W	
3329	4822 116 52256	2,2kΩ	5%	0,16W	
3330 ©	4822 051 30103	10kΩ	5%	0,06W	
3331 ©	4822 051 30103	10kΩ	5%	0,06W	
3332 ©	4822 051 30332	3,3kΩ	5%	0,06W	
3334 ©	4822 051 30102	1kΩ	5%	0,06W	
3336 ©	4822 051 30123	12kΩ	5%	0,06W	
3337 ©	4822 051 30471	470Ω	5%	0,06W	
3338 ©	4822 051 30102	1kΩ	5%	0,06W	
3339 ©	4822 051 30222	2,2kΩ	5%	0,06W	
3340 ©	4822 051 30471	470Ω	5%	0,06W	
3341 ©	4822 051 30682	6,8kΩ	5%	0,06W	
3342 ©	4822 051 30121	120Ω	5%	0,06W	
3343 ©	4822 051 30151	150Ω	5%	0,06W	

RESISTORS

3344 ©	4822 051 30471	470Ω	5%	0,06W	
3345 ©	4822 051 30471	470Ω	5%	0,06W	
3346 ©	4822 051 30479	47Ω	5%	0,06W	
3400 ©	4822 051 30273	27kΩ	5%	0,06W	
3401 ©	4822 051 30471	470Ω	5%	0,06W	
3403 ©	4822 051 30273	27kΩ	5%	0,06W	
3404 ©	4822 051 30682	6,8kΩ	5%	0,06W	
3405 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3406 ⚠	4822 052 10109	10Ω	5%	NFR	
3407 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3408 ©	4822 051 30682	6,8kΩ	5%	0,06W	
3409 ©	4822 051 30273	27kΩ	5%	0,06W	
3411	4822 116 52283	4,7kΩ	5%	0,5W	
3412 ⚠	4822 052 10568	5,6Ω	5%	0,33W	
3413 ©	4822 051 30471	470Ω	5%	0,06W	
3415 ©	4822 051 30273	27kΩ	5%	0,06W	
3422 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3423 ©	4822 051 30103	10kΩ	5%	0,06W	
3424 ©	4822 051 30103	10kΩ	5%	0,06W	
3425 ©	2120 108 91909	39Ω	5%		
3426 ©	2120 108 91909	39Ω	5%		
3427 ©	4822 051 30103	10kΩ	5%	0,06W	
3428 ©	4822 051 30103	10kΩ	5%	0,06W	
3429 ©	2120 108 91909	39Ω	5%		
3430 ©	2120 108 91909	39Ω	5%		
3431 ©	4822 051 30562	5,6kΩ	5%	0,06W	
3432 ©	4822 051 30102	1kΩ	5%	0,06W	
3433 ©	4822 051 30102	1kΩ	5%	0,06W	
3434 ©	4822 051 30222	2,2kΩ	5%	0,06W	
3435 ©	4822 051 30271	270Ω	5%	0,06W	
3436 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3437 ©	4822 051 30562	5,6kΩ	5%	0,06W	
3438 ©	4822 051 30103	10kΩ	5%	0,06W	
3439 ©	4822 051 30103	10kΩ	5%	0,06W	
3440	4822 116 81154	2,2Ω	5%	0,5W	
3500 ©	4822 051 30152	1,5kΩ	5%	0,06W	
3504 ©	4822 051 30103	10kΩ	5%	0,06W	
3506 ©	4822 051 30471	470Ω	5%	0,06W	
3507 ©	4822 117 12902	8,2kΩ	1%	0,06W	
3514 ©	4822 051 30153	15kΩ	5%	0,06W	
3518 ©	4822 051 30152	1,5kΩ	5%	0,06W	
3519 ©	4822 051 30103	10kΩ	5%	0,06W	
3520 ©	4822 051 30153	15kΩ	5%	0,06W	
3522 ©	4822 051 30152	1,5kΩ	5%	0,06W	
3523 ©	4822 051 30152	1,5kΩ	5%	0,06W	
3524 ©	4822 117 11817	1,2kΩ	1%	0,06W	
3525 ©	4822 051 30273	27kΩ	5%	0,06W	
3526 ©	4822 051 30334	330kΩ	5%	0,06W	
3527 ©	4822 051 30273	27kΩ	5%	0,06W	
3529 ©	4822 051 30154	150kΩ	5%	0,06W	
3531 ©	4822 051 30154	150kΩ	5%	0,06W	
3532 ©	4822 117 12864	82kΩ	5%	0,06W	
3534	4822 052 10109	10Ω	5%	NFR	
3535 ©	4822 051 30562	5,6kΩ	5%	0,06W	
3536 ©	4822 051 30223	22kΩ	5%	0,06W	
3539 ©	4822 051 30153	15kΩ	5%	0,06W	
3542 ©	4822 051 30123	12kΩ	5%	0,06W	
3543 ©	4822 117 12902	8,2kΩ	1%	0,06W	
3544 ©	4822 051 30562	5,6kΩ	5%	0,06W	
3545 ©	4822 051 30393	39kΩ	5%	0,06W	
3549 ©	4822 051 30101	100Ω	5%	0,06W	
3550 ©	4822 051 30393	39kΩ	5%	0,06W	

ELECTRICAL PARTSLIST *POWER 2003 100W Class-D COMBI BOARD*

RESISTORS

3551 ©	4822 051 30101	100Ω	5%	0,06W	
3552 ©	4822 051 30101	100Ω	5%	0,06W	
3553 ©	4822 051 30101	100Ω	5%	0,06W	
3554 ©	4822 051 30101	100Ω	5%	0,06W	
3555 ©	4822 051 30472	4,7kΩ	5%	0,06W	
3556 ©	4822 051 30123	12kΩ	5%	0,06W	
3557 ©	4822 051 30101	100Ω	5%	0,06W	
3558 ©	4822 117 12903	1,8kΩ	1%	0,06W	
3559 ©	4822 117 12903	1,8kΩ	1%	0,06W	
3560 ©	4822 051 30101	100Ω	5%	0,06W	
3561 ©	4822 051 30102	1kΩ	5%	0,06W	
3562 ©	4822 051 30102	1kΩ	5%	0,06W	
3563 ©	4822 051 30101	100Ω	5%	0,06W	
3564 ©	4822 051 30101	100Ω	5%	0,06W	
3566 ©	4822 051 30101	100Ω	5%	0,06W	
3567 ©	4822 051 30332	3,3kΩ	5%	0,06W	
3568 ©	4822 051 30101	100Ω	5%	0,06W	
3569 ©	4822 051 30102	1kΩ	5%	0,06W	
3570 ©	4822 117 13632	100kΩ	1%	0,06W	
3571 ©	4822 051 30223	22kΩ	5%	0,06W	
3572	4822 116 83883	470Ω	5%	0,16W	
3573	4822 116 83883	470Ω	5%	0,16W	
3574 ©	4822 051 30101	100Ω	5%	0,06W	
3575 ©	4822 051 30562	5,6kΩ	5%	0,06W	
3576 ©	4822 051 30123	12kΩ	5%	0,06W	
3577 ©	4822 051 30153	15kΩ	5%	0,06W	
3578 ©	4822 117 12902	8,2kΩ	1%	0,06W	
3579 ©	4822 051 30562	5,6kΩ	5%	0,06W	
3580 ©	4822 051 30472	4,7kΩ	5%	0,06W	
4101 ©	4822 051 20008	CHIP JUMPER 0805			
4102 ©	4822 051 20008	CHIP JUMPER 0805			
4201 ©	4822 051 20008	CHIP JUMPER 0805			
4202 ©	4822 051 20008	CHIP JUMPER 0805			
4211 ©	4822 051 20008	CHIP JUMPER 0805			
4212 ©	4822 051 20008	CHIP JUMPER 0805			
4213 ©	4822 051 30008	CHIP JUMPER 0603			
4214 ©	4822 051 20008	CHIP JUMPER 0805			
4215 ©	4822 051 30008	CHIP JUMPER 0603			
4216 ©	4822 051 30008	CHIP JUMPER 0603			
4217 ©	4822 051 30008	CHIP JUMPER 0603			
4221 ©	4822 051 30008	CHIP JUMPER 0603			
4223 ©	4822 051 30008	CHIP JUMPER 0603			
4226 ©	4822 051 30008	CHIP JUMPER 0603			
4230 ©	4822 051 30008	CHIP JUMPER 0603			
4232 ©	4822 051 30008	CHIP JUMPER 0603			
4233 ©	4822 051 30008	CHIP JUMPER 0603			
4235 ©	4822 051 30008	CHIP JUMPER 0603			
4240 ©	4822 051 20008	CHIP JUMPER 0805			
4241 ©	4822 051 20008	CHIP JUMPER 0805			
4242 ©	4822 051 30008	CHIP JUMPER 0603			
4243 ©	4822 051 30008	CHIP JUMPER 0603			
4245 ©	4822 051 30008	CHIP JUMPER 0603			
4253 ©	4822 051 30008	CHIP JUMPER 0603			
4260 ©	4822 051 20008	CHIP JUMPER 0805			
4265 ©	4822 051 30008	CHIP JUMPER 0603			
4272 ©	4822 051 30008	CHIP JUMPER 0603			
4273 ©	4822 051 30008	CHIP JUMPER 0603			
4274 ©	4822 051 20008	CHIP JUMPER 0805			
4276 ©	4822 051 30008	CHIP JUMPER 0603			
4277 ©	4822 051 30008	CHIP JUMPER 0603			
4279 ©	4822 051 30008	CHIP JUMPER 0603			
4301 ©	4822 051 30008	CHIP JUMPER 0603			

COILS

5100	4822 526 10494	FERRITE BEAD
5101	2422 536 00612	30µH
5102	2422 549 44944	Mains Filter 330µH 3A
5103	4822 526 10494	FERRITE BEAD
5104	4822 526 10494	FERRITE BEAD
5200	4822 526 10494	FERRITE BEAD
5201	2422 536 00612	30µH
5202	2422 549 44944	Mains Filter 330µH 3A
5203	4822 526 10494	FERRITE BEAD
5300	2422 540 98542	Resonator 500kHz
5302	2422 540 98561	Resonator 425kHz

DIODES

6104 ©	4822 130 11397	BAS316
6105 ©	4822 130 11397	BAS316
6106 ©	4822 130 11416	PDZ6.8B
6108 ©	4822 130 11416	PDZ6.8B
6109 ©	4822 130 11397	BAS316
6110 ©	5322 130 34337	BAV99
6111 ©	4822 130 11397	BAS316
6113 ©	5322 130 34337	BAV99
6114 ©	5322 130 34337	BAV99
6202 ©	4822 130 11397	BAS316
6205 ©	5322 130 34337	BAV99
6206 ©	5322 130 34337	BAV99
6208 ©	5322 130 34337	BAV99
6210 ©	5322 130 34337	BAV99
6211 ©	5322 130 34337	BAV99
6212 ©	4822 130 11416	PDZ6.8B
6213 ©	4822 130 11416	PDZ6.8B
6214 ©	4822 130 11397	BAS316
6216	4822 130 30621	1N4148
6217 ©	4822 130 11397	BAS316
6300 ©	4822 130 10838	UDZ3.3B
6401	4822 130 30621	1N4148
6403 ©	4822 130 10838	UDZ3.3B
6501 ©	9322 102 64685	UDZ-2,7B
6502 ©	4822 130 11397	BAS316
6503 ©	4822 130 11397	BAS316
6504 ©	4822 130 11397	BAS316
6505 ©	4822 130 11397	BAS316
6506 ©	9322 150 18685	BZX384-C47
6507 ©	9322 150 18685	BZX384-C47
6508 ©	3198 020 55680	BZX384-C5V6

TRANSISTORS

7104 ©	4822 130 60373	BC856B
7109 ⚠	9322 173 29687	STP14NF12FP Power FET
7110 ©	3198 010 42310	BC847BW
7111 ©	3198 010 44350	BC807-25W
7112 ©	3198 010 42320	BC857BW
7113 ©	3198 010 44350	BC807-25W
7114 ©	9340 219 30115	BC817-25W
7115 ©	9340 219 30115	BC817-25W
7117 ©⚠	9322 043 49685	MMBTA42
7119 ©	9322 043 49685	MMBTA42
7121 ⚠	9322 173 29687	STP14NF12FP Power FET
7128 ©	4822 130 60373	BC856B
7129 ©	4822 130 60373	BC856B
7130 ©	3198 010 42310	BC847BW
7131 ©	5322 130 60159	BC846B

ELECTRICAL PARTSLIST *POWER 2003 100W Class-D COMBI BOARD*

TRANSISTORS

7203	©	3198 010 42310	BC847BW
7208	©	4822 130 60373	BC856B
7210	©	3198 010 44350	BC807-25W
7211	©	3198 010 42320	BC857BW
7218	▲	9322 173 29687	STP14NF12FP Power FET
7221	©	3198 010 44350	BC807-25W
7222	©	9340 219 30115	BC817-25W
7223	©	9340 219 30115	BC817-25W
7227	©▲	9322 043 49685	MMBTA42
7228	©▲	9322 043 49685	MMBTA42
7231	▲	9322 173 29687	STP14NF12FP Power FET
7238	©	5322 130 60159	BC846B
7239	©	4822 130 60373	BC856B
7240	©	4822 130 60373	BC856B
7243	©	9340 219 30115	BC817-25W
7309	©	3198 010 42310	BC847BW
7316	©	3198 010 42320	BC857BW
7317	©	3198 010 42310	BC847BW
7319	©	3198 010 42310	BC847BW
7323	©	9340 219 30115	BC817-25W
7324	©	9340 219 30115	BC817-25W
7402		4822 130 40855	BC337-40
7405	©	3198 010 42320	BC857BW
7407	©	9340 219 30115	BC817-25W
7408	©	9340 219 30115	BC817-25W
7409	©	9340 219 30115	BC817-25W
7410	©	3198 010 42320	BC857BW
7411	©	3198 010 44350	BC807-25W
7505	©	3198 010 42310	BC847BW
7506	©	3198 010 42320	BC857BW
7509	©	3198 010 42310	BC847BW

INTEGRATED CIRCUITS

7105	©	9350 694 90118	74LV14D
7118	©	9350 694 90118	74LV14D
7122	©	5322 209 11517	PC74HCU04T, HEX INVERTER IC
7209	©	9350 694 90118	74LV14D
7232	©	5322 209 11517	PC74HCU04T, HEX INVERTER IC
7235	©	9350 694 90118	74LV14D
7310		4822 209 14933	TL431IZ, PROGRAMMABLE VOLT. REF.
7312	©	5322 209 11517	PC74HCU04T, HEX INVERTER IC
7315		4822 209 81351	LM317MPTB
7320	©	4822 209 83357	NJM4560M
7321		4822 209 81351	LM317MPTB
7400	©	4822 209 31378	NJM4556M, 2-FOLD OP-AMP.
7406	©	4822 209 17345	M62320FP, I2C SHIFT REGISTER
7508	©	9322 150 74668	TDA7468D, SOURCE SEL. & SOUND

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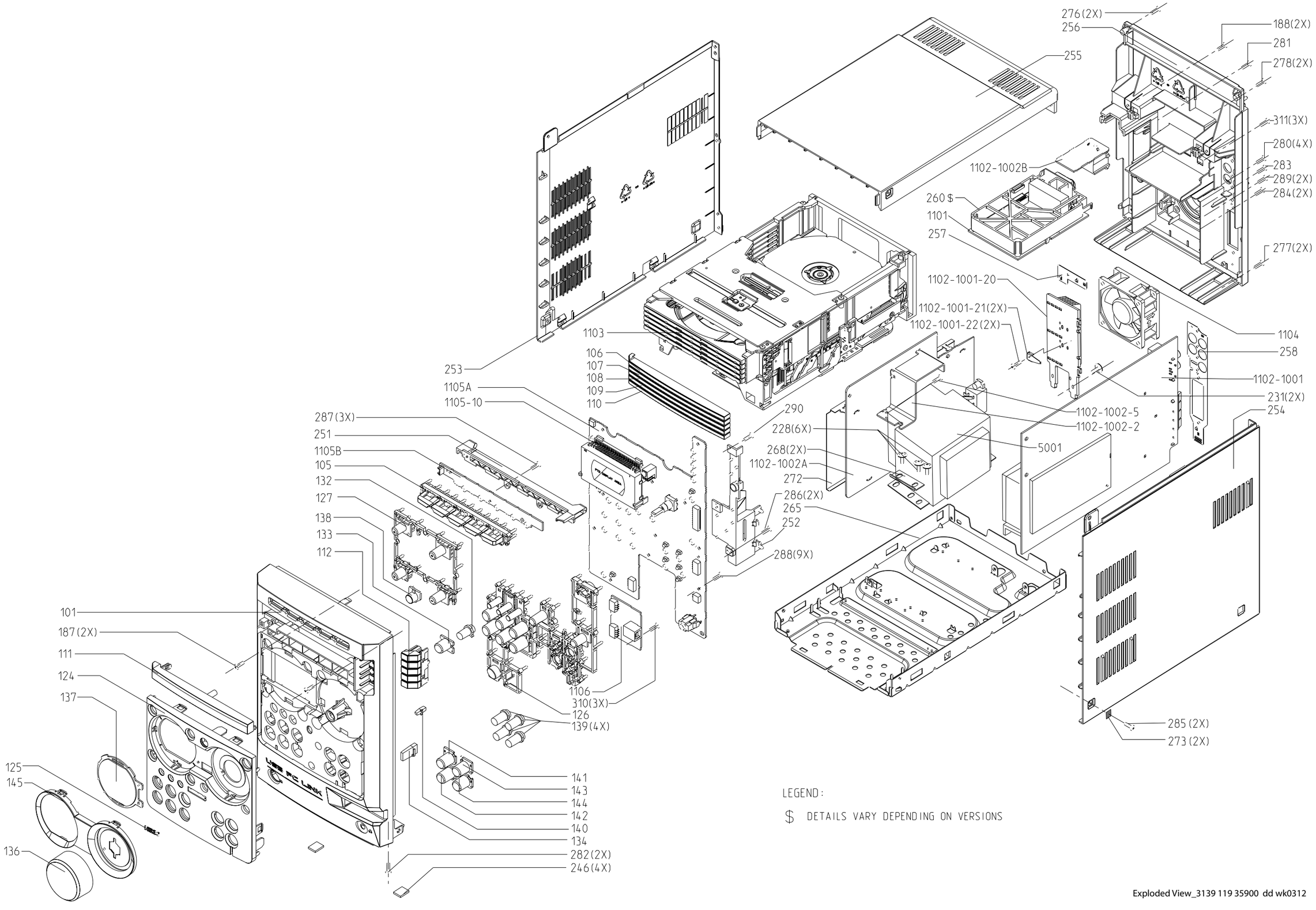
SET MECHANICAL EXPLODED VIEW



LEGEND:

$ DETAILS VARY DEPENDING ON VERSIONS

Exploded View_3139 119 35900 dd wk0312

MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

0101	3139 257 50601	Cabinet Front	/21/21M/22
0101	3139 257 50751	Cabinet Front	/37
0105	3139 118 19202	Button Set CD Play	
0106	3139 257 50621	Cover CD Tray 1	
0107	3139 257 50631	Cover CD Tray 2	
0108	3139 257 50641	Cover CD Tray 3	
0109	3139 257 50651	Cover CD Tray 4	
0110	3139 257 50661	Cover CD Tray 5	
0111	3139 257 50671	Cover CD Orn	
0112	3139 257 50681	Button CD Open/Close	
0124	3139 257 50691	Panel Front Orn	/22
0124	3139 257 50761	Panel Front Orn	/21/21M/37
0125	4822 459 11086	Badge Assembly PHILIPS	
0126	3139 257 50701	Button Set Control	
0127	3139 257 50711	Button Set MP3	
0133	3139 118 19271	Cap Button MAX	
0136	3139 257 50741	Knob Volume	
0137	3139 118 19291	Lens FTD	
0138	3139 114 77381	Lens IR	
0141	3139 114 77301	Cap Button CD	
0142	3139 114 77591	Cap Button AUX	
0143	3139 114 77601	Cap Button TUNER	
0144	3139 114 77611	Cap Button PC LINK	
0145	3139 257 50731	Ring Volume & FTD	
0246	3139 113 27140	Foot Rubber 4mm	
0251	3139 114 77401	Bracket Top	
0252	3139 114 77411	Bracket Combi	
0253	3139 114 77242	Panel Left	/21/21M/22
0253	3139 114 78691	Panel Left	/37
0254	3139 114 77232	Panel Right	/21/21M/22
0254	3139 114 78701	Panel Right	/37
0255	3139 114 77631	Cover Top	/21/21M/22
0255	3139 114 78711	Cover Top	/37
0256	3139 114 77251	Cabinet Rear	/21/22
0256	3139 114 79391	Cabinet Rear	/21M
0256	3139 114 78721	Cabinet Rear	/37
0345	3139 119 00511	L/R Loudspeaker Box	/37
0346	3139 119 00521	L/R Loudspeaker Box	/21/21M/22
0351	4822 303 50063	FM Aerial	/21/21M/22
0351	4822 320 11094	FM Antenna	/37
0352	4822 303 50082	Antenna AM Loop	
0353	3139 228 61361	Remote Control	
0356	2422 070 98151 ⚠	Mains Cord	/21/21M/22
0356	2422 070 98246 ⚠	Mains Cord	/37
0357	4822 263 21092 ⚠	Adaptor Plug 6A 250V	/21

0364	2422 076 00523	Cable USB-A/USB-B 1M5 4P	
0369	3139 119 00891	CD-ROM USB PC LINK Installer SW	
0370	3139 115 22401	Instruction For Use	/21/21M
0370	3139 115 22161	Instruction For Use	/22
0370	3139 115 22181	Instruction For Use	/37
1104	2822 031 01494	Fan 12VDC 0,8W 3100RPM	
1106	3103 308 66991	PBAS USB PC LINK	
5001	3103 308 30901 ⚠	Mains Transformer	/21/21M
5001	3103 308 30911 ⚠	Mains Transformer	/22
5001	3103 308 30921 ⚠	Mains Transformer	/37
8001	3139 110 35900	FFC Foil 07P/220/07P AD	
8003	3139 111 02551	FFC Foil 15P/480/15P BD Fold	
8004	3139 111 02541	FFC Foil 08P/280/08P AD Fold	
8005	4822 320 12654	FFC Foil 07P/220/07P AD	
8006	3139 111 02101	FFC Foil 08P/100/08P BD	
8007	3139 110 35250	FFC Foil 04P/120/04P AD	
8008	3139 111 02371	FFC Foil 19P/180/19P AD Fold	
8009	3139 110 35080	FFC Foil 09P/180/09P AD	

LEFT/RIGHT LOUDSPEAKER BOX BREAKDOWN

8299 297 51040	Grille Assembly	
4399 294 82891	Grommet	

Note : Only the parts mentioned in this list are normal service spare parts.

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SCREW LISTS - MAIN UNIT

187	D3 x 10
188	D3 x 10
228	M3 x 6
231	M3 x 6
276	D3 x 12
277	M3 x 10
278	D3 x 10
280	D3 x 10
281	D3 x 10
282	M3 x 6
283	D3 x 10
284	D3 x 10
285	M3 x 10
286	D3 x 10
287	D3 x 10
288	D3 x 10
289	D3 x 10
290	D3 x 12
310	D3 x 10
311	D3 x 10