

Service
Service
Service



Service Manual



TABLE OF CONTENTS

	Page
Location of pc boards & Version variations	1-2
Technical Specifications	1-3
Measurement setup	1-4
Service Aids, Safety Instruction, etc	1-5 to 1-7
Preparations & Controls	1-8 to 1-10
Maintenance & Troubleshooting	1-11
Disassembly Instructions & Service positions	2
Service Test Program & DEMO Mode	3
Set Block diagram	4-1
Set Wiring diagram	5-1
Front Board	6
ECO6 Tuner Board : Systems Non-Cenelec	7A
ECO6 Tuner Board : Systems Cenelec	7B
ETF7 Tape Board	8
3CDC-LC-MP3CD2002 Module	10
Power Module (30-70W Version)	11
AF9 Board	12
Set Mechanical Exploded view & parts list	13

© Copyright 2005 Philips Consumer Electronics B.V. Eindhoven, The Netherlands
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, or otherwise without the prior permission of Philips.

Published by SL0512 Service Audio

Printed in The Netherlands Subject to modification.



3141 785 30160

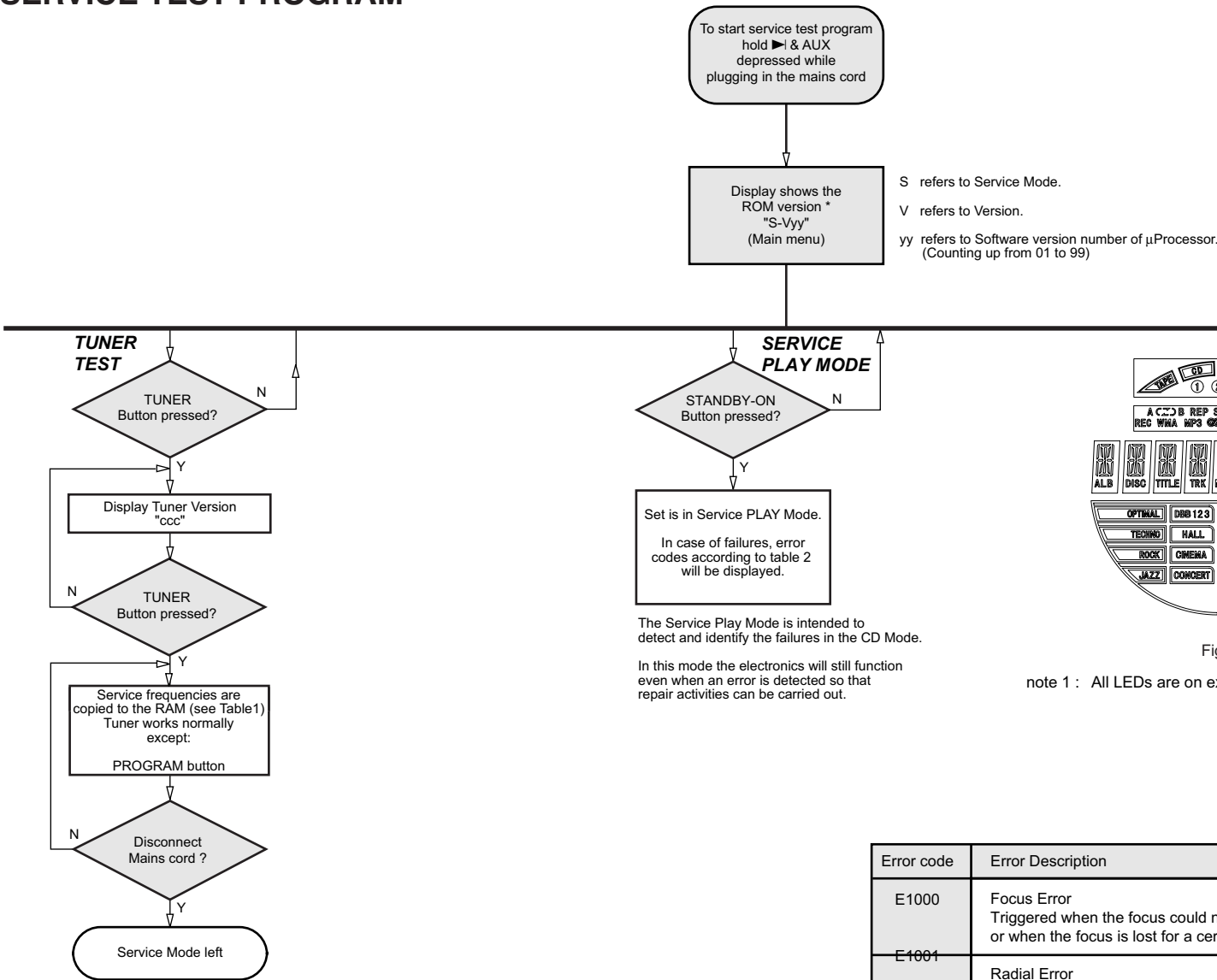
**CLASS 1
LASER PRODUCT**

Version 1.0



PHILIPS

SERVICE TEST PROGRAM



PRESET	Europe "EUR"	East Eur. Extended-band "EAS"	East Eur. "EAS"	USA "USA"	Oversea "OSE"
1	87.5MHz	65.81MHz	87.5MHz	87.5MHz	87.5MHz
2	108MHz	108MHz	108MHz	108MHz	108MHz
3	531kHz	74MHz	531kHz	530kHz	530/531kHz*
4	1602kHz	87.5MHz	1602kHz	1700kHz	1700/1602kHz*
5	558kHz	531kHz	558kHz	560kHz	560/558kHz*
6	1494kHz	1602kHz	1494kHz	1500kHz	1500/1494kHz*
7	153kHz	558kHz	87.5MHz	98MHz	98/87.5MHz*
8	279kHz	1494kHz	87.5MHz	87.5MHz	87.5MHz
9	198kHz	98MHz	87.5MHz	87.5MHz	87.5MHz
10	98MHz	70.01MHz	87.5MHz	87.5MHz	87.5MHz
11	87.5MHz	65.81MHz	98MHz	87.5MHz	87.5/98MHz*

Table 1

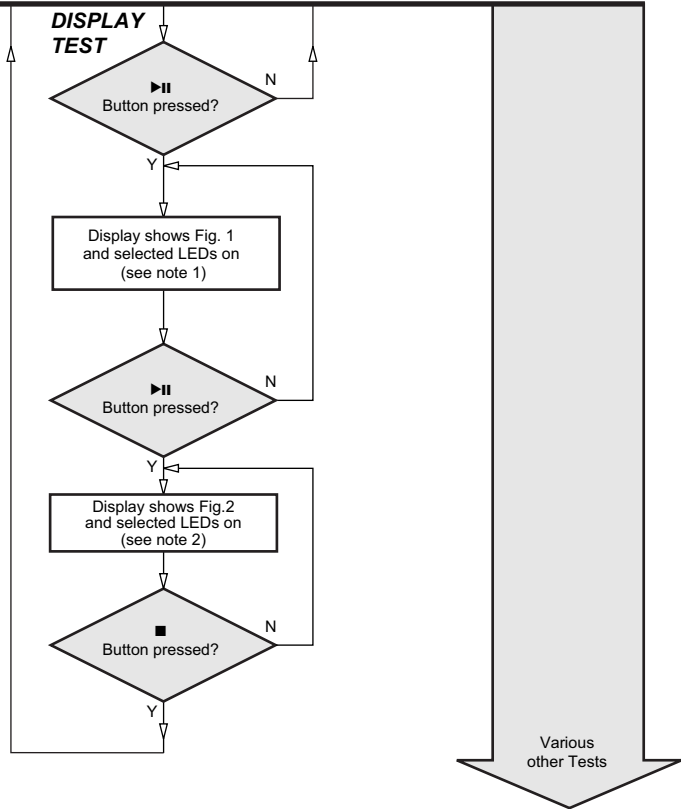
Note: * Depending on the selected grid frequency (9 or 10kHz)

By holding the TUNER 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.

DEMO Mode

	ACTION
To Switch off	Hold the ■ button down for 5 seconds during the DEMO display, the set will confirm with "DEMO OFF" and switch to Standby.
To Switch on	Hold the ■ button down for 5 seconds during Standby, DEMO will begin.

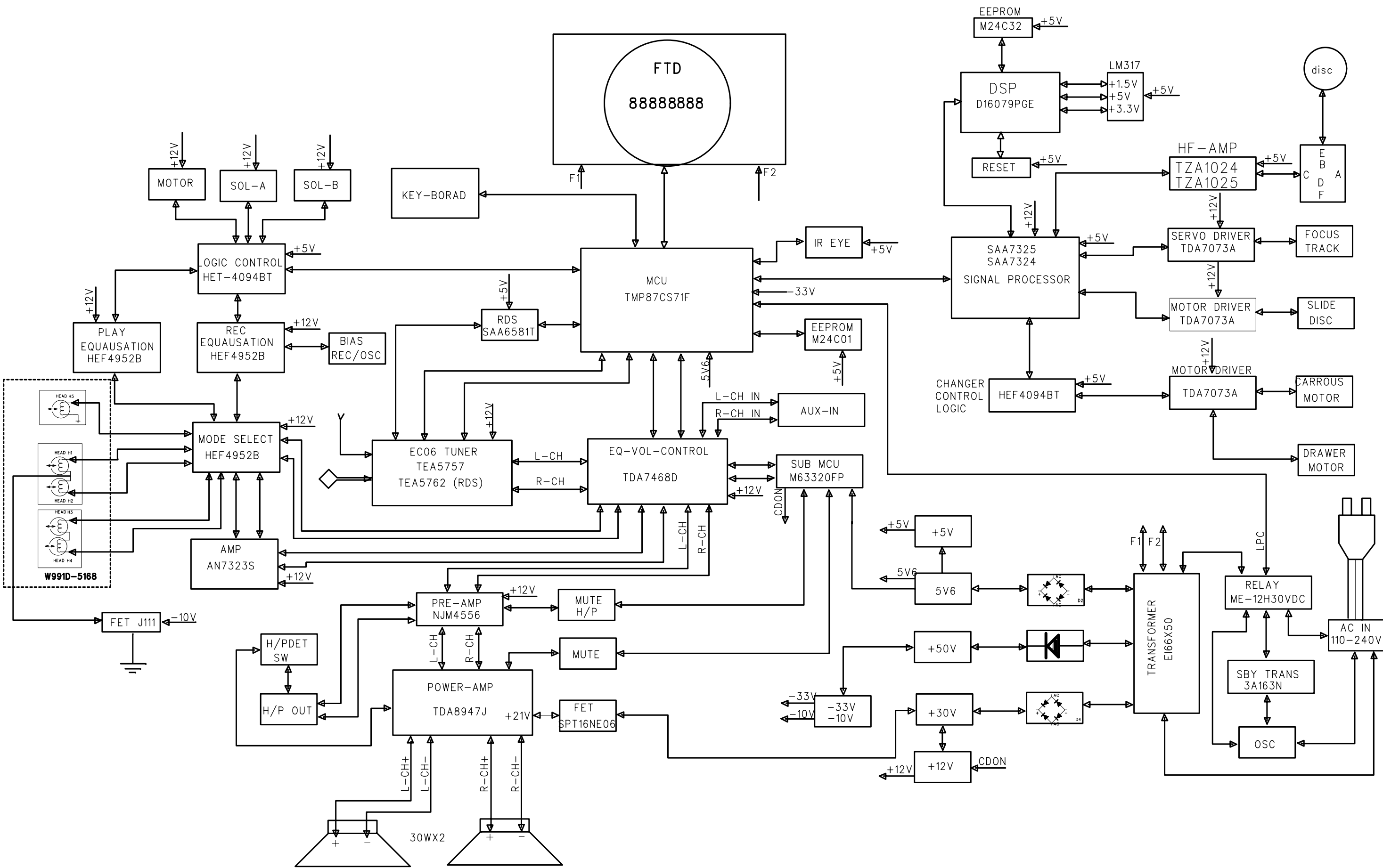


TEST	Activated with	ACTION
EEPROM TEST	▶▶ ■ to Exit	A test pattern will be sent to the EEPROM. "PASS" is displayed if the uProcessor read back the test pattern correctly, otherwise "FAIL" will be displayed.
EEPROM FORMAT	◀◀	Load default data. Display shows "NEW" for 1 second. Caution! All presets from the customer will be lost!!
ROTARY ENCODER TEST	Volume Knob or Jog Shuttle knob	Display shows value for 2 seconds. Values increases or decreases in steps of 1 until 0 (Min.) or 40 (Max.) is reached.
LEAVE SERVICE TESTPROGRAM	Disconnect mains cord	

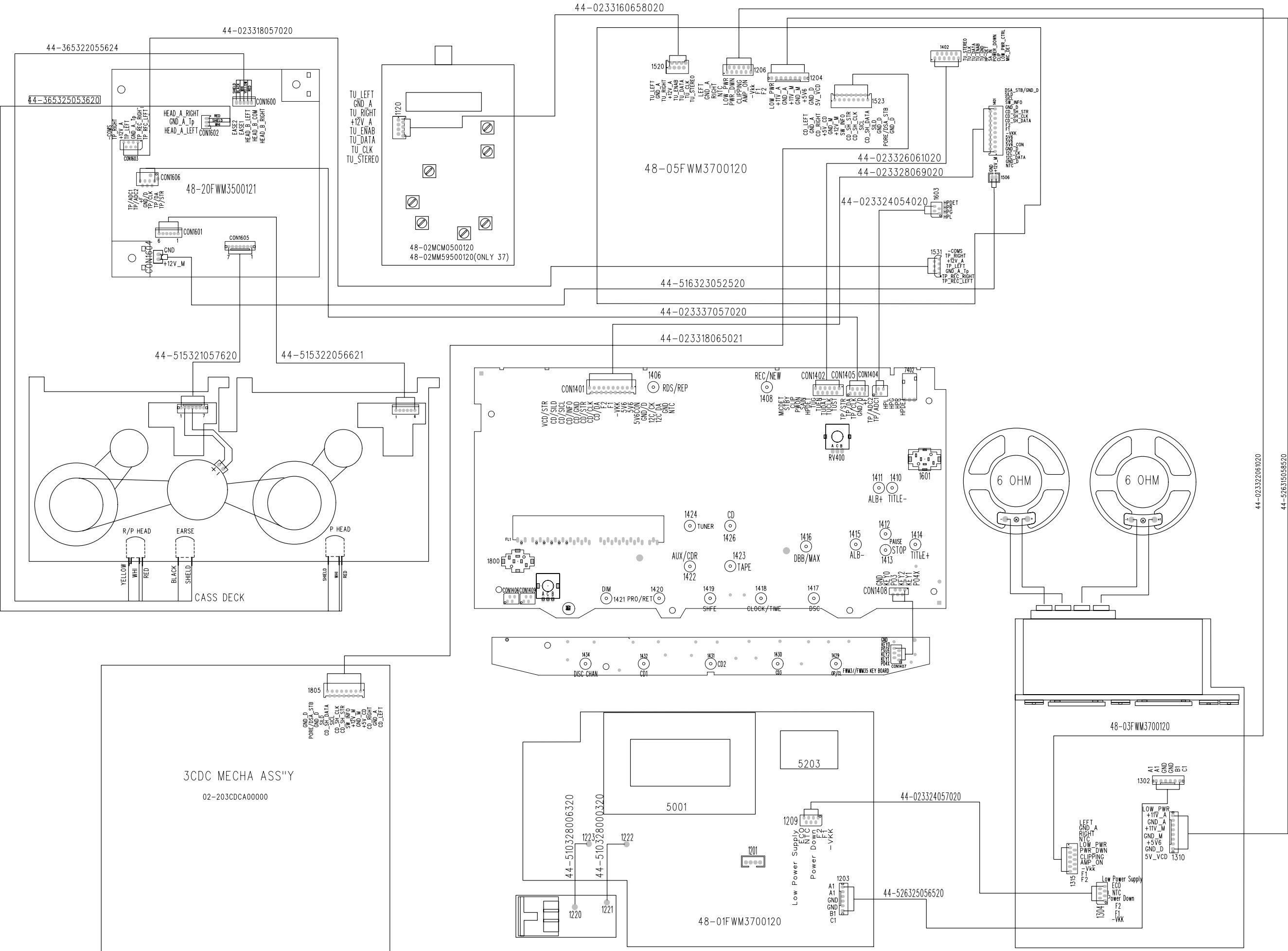
Error code	Error Description
E1000	Focus Error Triggered when the focus could not be found within a certain time when starting up the CD or when the focus is lost for a certain time during play.
E1001	Radial Error Triggered when the radial servo is off-track for a certain time during play.
E1002	Sledge In Error The sledge did not reach its inner position (inner-switch is still close) before approximately 6 Sec. 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 250 mSec. have passed by. Inner-switch or sledge motor problem.
E1005	Jump-offtrack error Triggered in normal play when the jump destination could not be found within a certain time. When this error occurred, software will try to recover by initiating the jump command again. If it is recoverable, the disc will continue to play.
E1006	Subcode Error Triggered when a new subcode was missing for a certain time during play.
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 startup within a certain time. Discmotor problem.
E1070	Focus Search Error The focus point has not been found within a certain time.
E1071	This happens when the carousel switch is defective and closed all the time, or when the carousel is blocked when it is located exactly at a disc position.
E1079	This happens when the carousel switch is defective and does not closed electrically, or when the carousel is blocked in between two disc positions. The time-out is approximately 5 Sec.
	The drawer could not open or enter the inside position and is opening again. This happen when the drawer is blocked and cannot go fully inside or when the drawer switch is defective and does not close.

Table 2

SET BLOCK DIAGRAM



SET WIRING DIAGRAM



INTERNAL BLOCK DIAGRAM
MICROCONTROLLER - IC TMP87PS71F

FRONT & KEY BOARD

TABLE OF CONTENTS

Internal IC Diagram & Pin Assignment 6-1

Internal IC Diagram & Pin Description 6-2

Internal IC Diagram & Pin Description 6-3

PCB Layout Top View 6-4

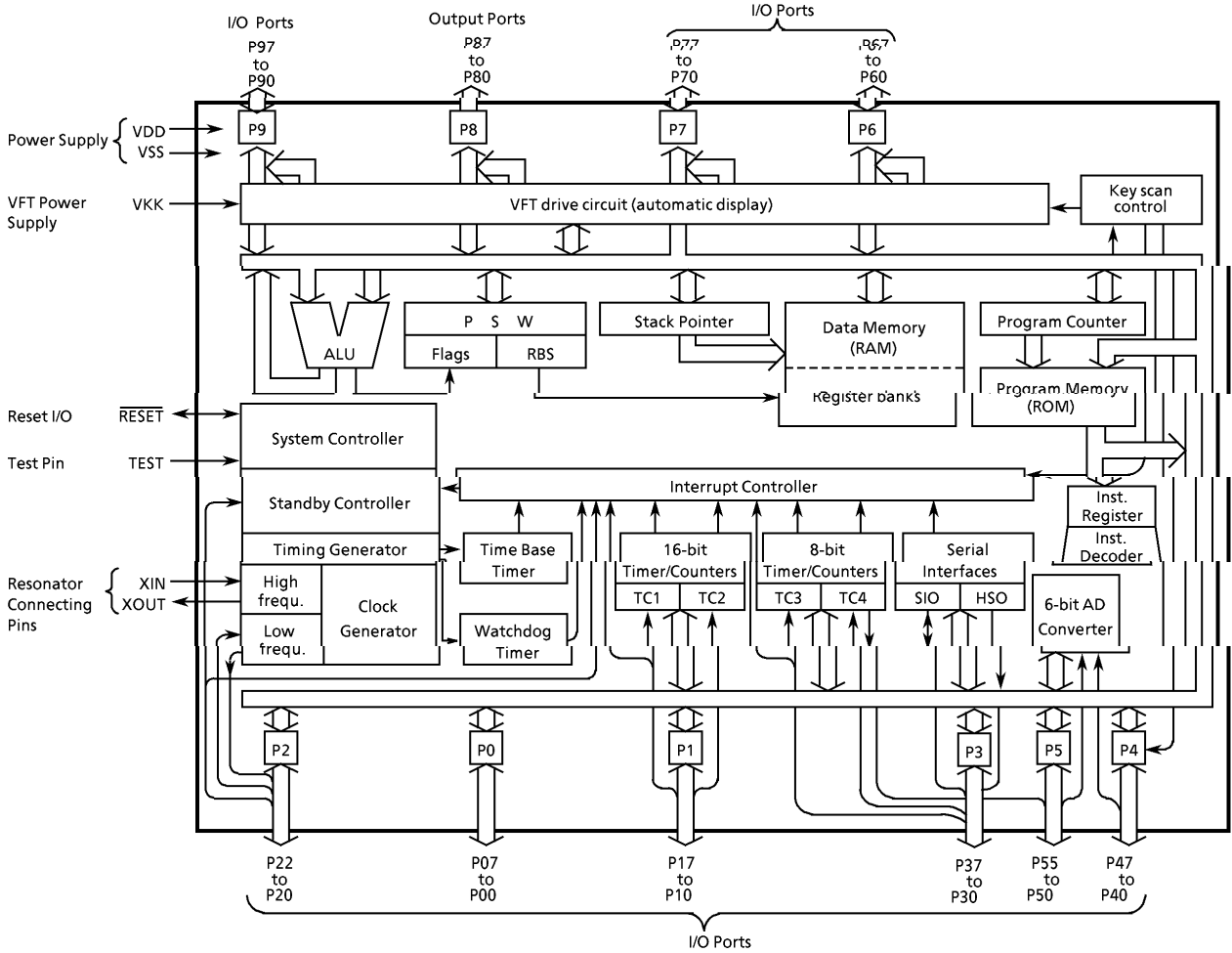
PCB Layout Bottom View 6-5

Circuit Diagram (MCU Part) 6-6

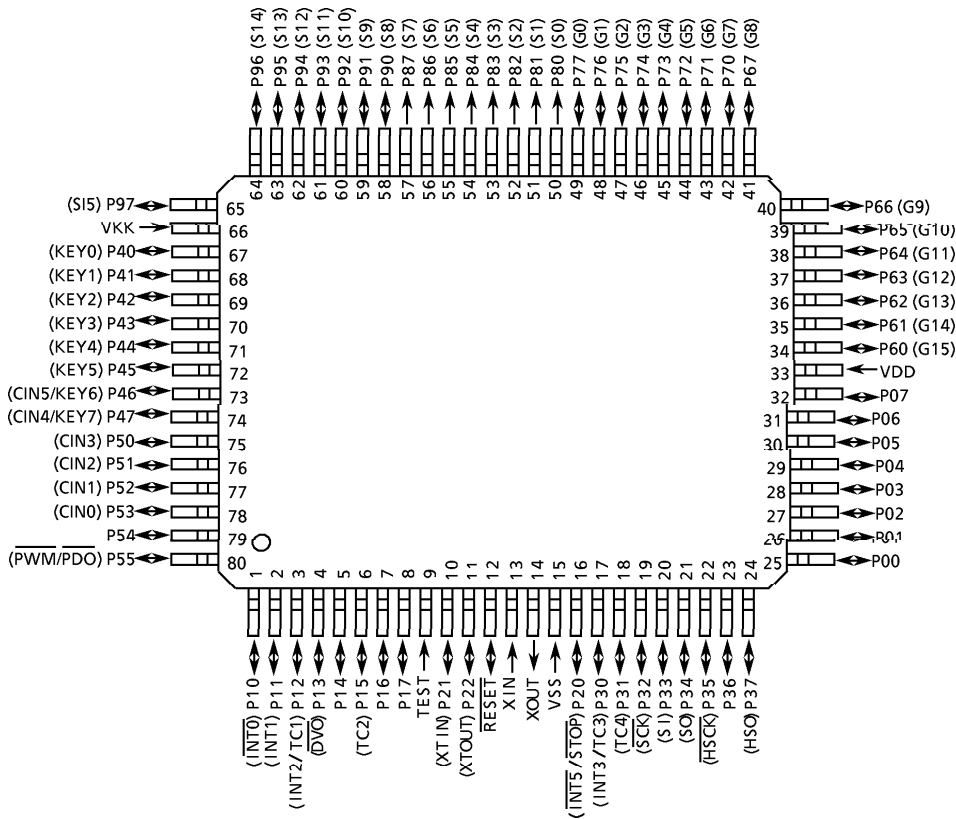
Circuit Diagram (Mic Part) 6-7

Electrical Parts List 6-8

Remark: For Ver. 22, the whole Front Board Ass'y can be orderd with 12nc: 9940 000 01505



PIN ASSIGNMENT (TOP VIEW)
MICROCONTROLLER - IC TMP87PS71F



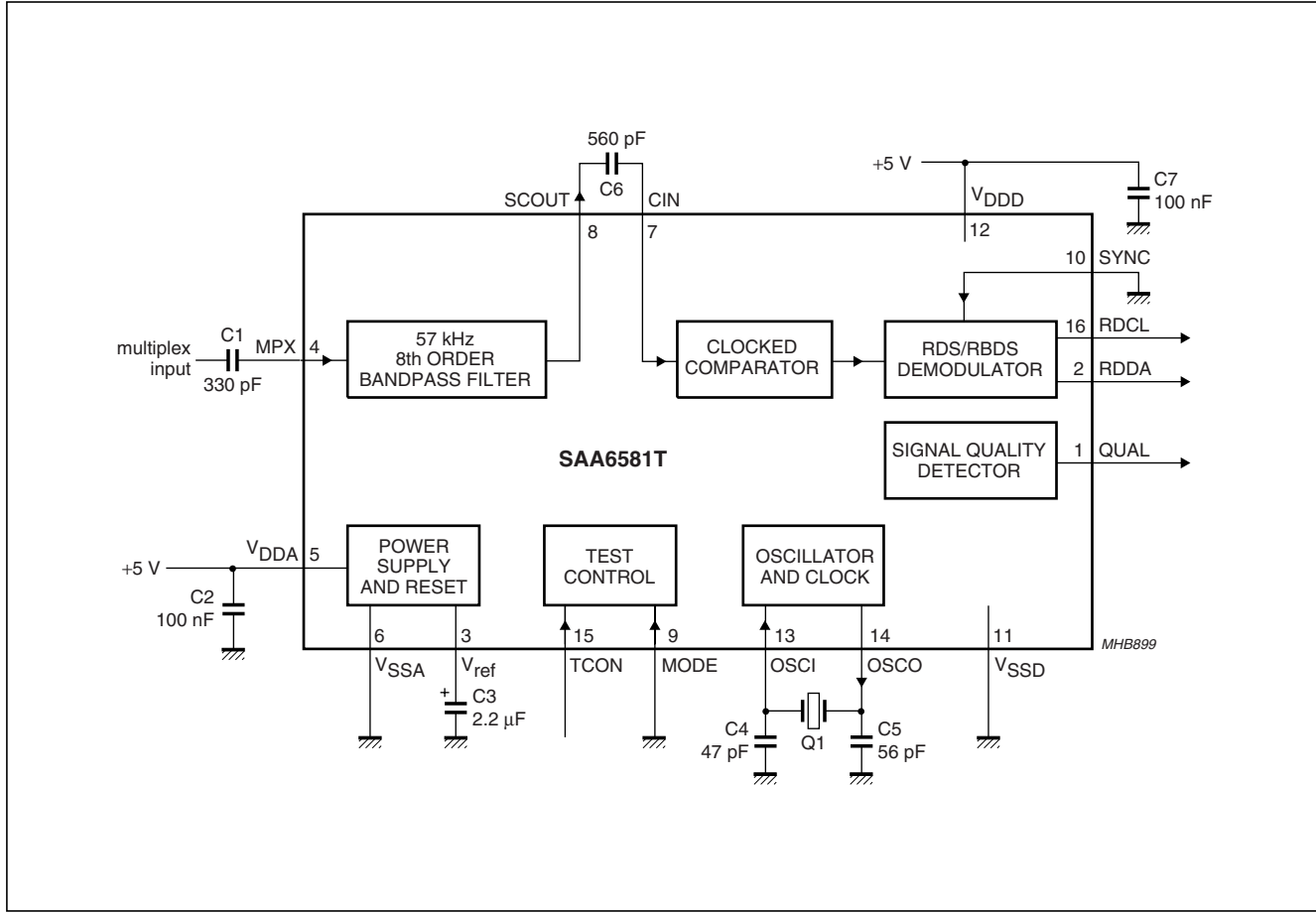
PIN DESCRIPTION
MICROCONTROLLER - IC TMP87PS71F

Pin Function

Pin Name	Input / Output	Function	
P07 to P00	I/O	Two 8-bit programmable input/output ports (tri-state). Each bit of these ports can be individually configured as an input or an output under software control. During reset, all bits are configured as inputs. When used as a divider output, the latch must be set to "1".	
P17, P16, P14	I/O		
P15 (TC2)	I/O (Input)		Timer/Counter 2 input
P13 (DVO)	I/O (Output)		Divider output
P12 (INT2 / TC1)	I/O (Input)		External interrupt input 2 or Timer/Counter 1 input
P11 (INT1)			External interrupt input 1
P10 (INT0)		External interrupt input 0	
P22 (XTOUT)	I/O (Output)	3-bit input/output port with latch. When used as an input port, the latch must be set to "1".	Resonator connecting pins (32.768 kHz). For inputting external clock, XTIN is used and XTOUT is opened.
P21 (XTIN)	I/O (Input)		External interrupt input 5 or STOP mode release signal input
P20 (INT5 / STOP)			
P37 (HSO)	I/O (Output)	8-bit input/output port with latch. When used as an input port, a HSO output, a SIO input/output, a timer/counter input, or an interrupt input, the latch must be set to "1".	HSO serial data output
P36	I/O		
P35 (HSC)	I/O (Output)		HSO serial clock output
P34 (SO)			SIO serial data output
P33 (SI)	I/O (Input)		SIO serial data input
P32 (SCK)	I/O (I/O)		SIO serial clock input/output
P31 (TC4)	I/O (Input)		Timer/Counter 4 input
P30 (INT3 / TC3)			External interrupt input 3 or Timer/Counter 3 input
P47 (CIN4 / KEY7), P46 (CIN5 / KEY6) P45 (KEY5) to P40 (KEY0)	I/O (Input)	8-bit input/output port with latch. When used as an input port, the latch must be set to "1".	Comparator inputs or Key scan inputs Key scan inputs
P55 (PWM / PDO)	I/O (Output)	6-bit input/output port with latch. When used as an input port, a comparator input, or a PWM / PDO output, the latch must be set to "1".	8-bit PWM output or 8-bit programmable divider output
P54	I/O		
P53 (CIN0) to P50 (CIN3)	I/O (Input)		Comparator inputs
P67 (G8) to P60 (G15)	I/O (Output)	Three 8-bit high breakdown voltage I/O ports with the latch. When used as a VFT driver output, the latch must be cleared to "0".	VFT digit driver outputs
P77 (G0) to P70 (G7)			
P97 (S15) to P90 (S8)			VFT segment driver outputs (Key strobe outputs)
P87 (S7) to P80 (S0)	Output (Output)	8-bit high breakdown voltage output port with latch. When used as VFT driver output, the latch must be cleared to "0".	
XIN, XOUT	Input, Output	Resonator connecting pins for high-frequency clock. For inputting external clock, XIN is used and XOUT is opened.	
RESET	I/O	Reset signal input or watchdog timer output/address-trap-reset output/system-clock-reset output.	
TEST	Input	Test pin for out-going test. Be tied to low.	
VDD, VSS	Power Supply	+ 5 V, 0 V (GND)	
VKK		VFT driver power supply	

INTERNAL BLOCK DIAGRAM
RDS/RBDS DEMODULATOR - IC SAA6581T

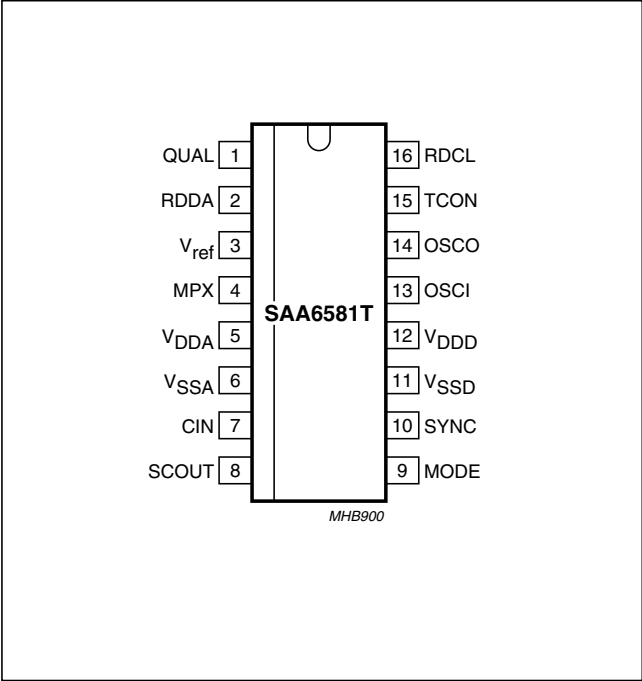
BLOCK DIAGRAM



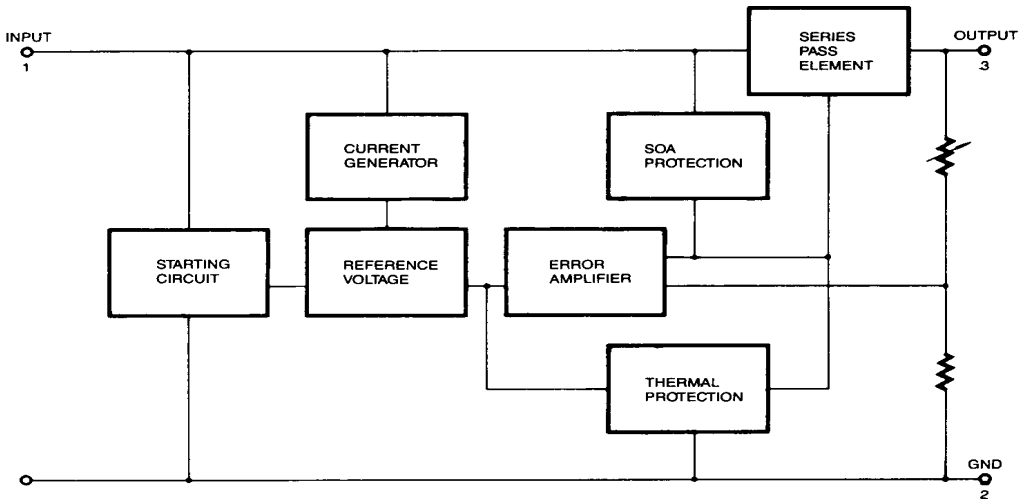
PIN DESCRIPTION
RDS/RBDS DEMODULATOR - IC SAA6581T

PINNING

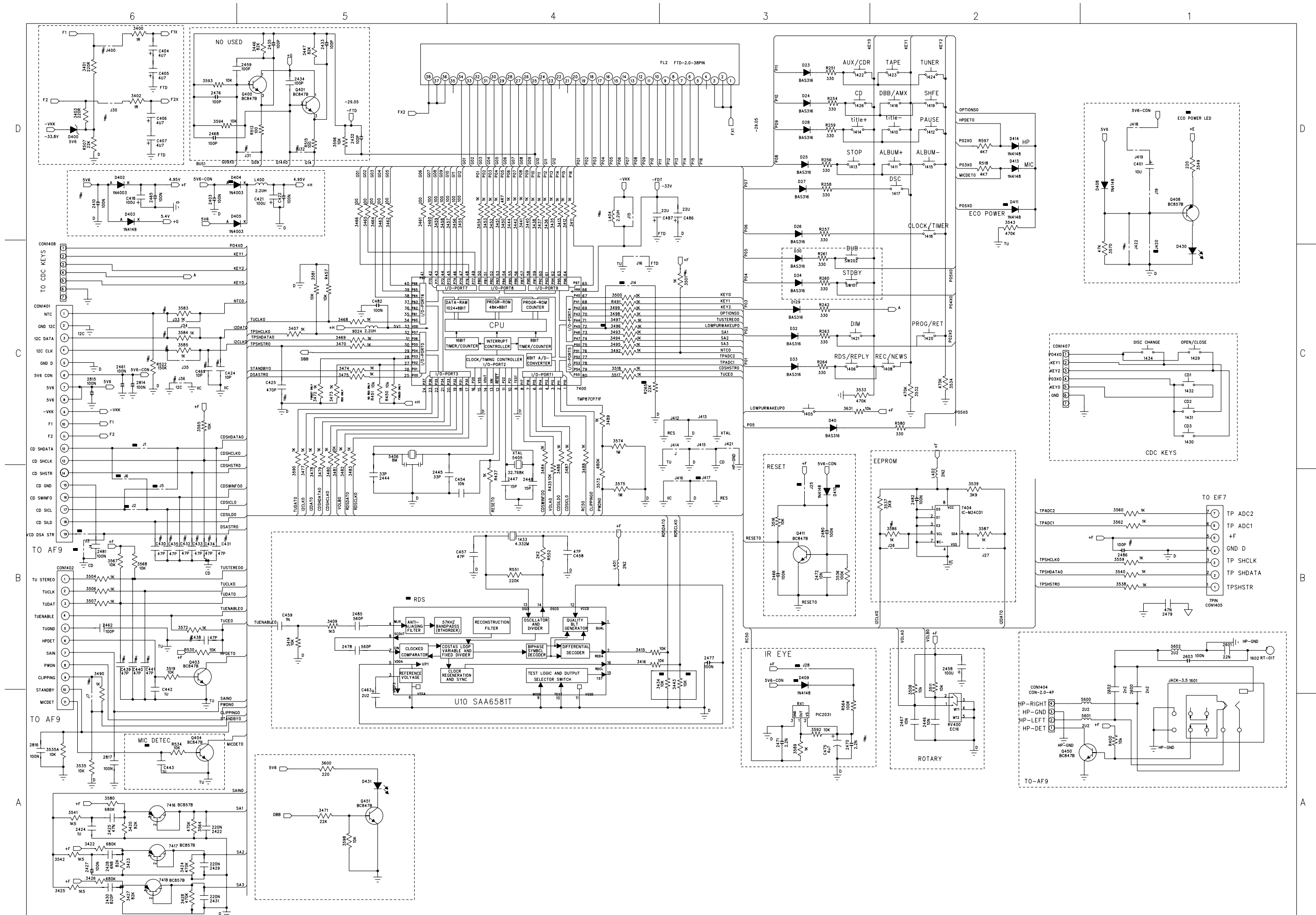
SYMBOL	PIN	DESCRIPTION
QUAL	1	signal quality indication output
RDDA	2	RDS data output
V _{ref}	3	reference voltage output (1/2 V _{DDA})
MPX	4	multiplex signal input
V _{DDA}	5	analog supply voltage (5 V)
V _{SSA}	6	analog ground (0 V)
CIN	7	comparator input
SCOUT	8	switched capacitor filter output
MODE	9	oscillator frequency select input
SYNC	10	ARI clamping control input
V _{SSD}	11	digital ground (0 V)
V _{DDD}	12	digital supply voltage (5 V)
OSCI	13	oscillator input
OSCO	14	oscillator output
TCON	15	test control input
RDCL	16	RDS clock output



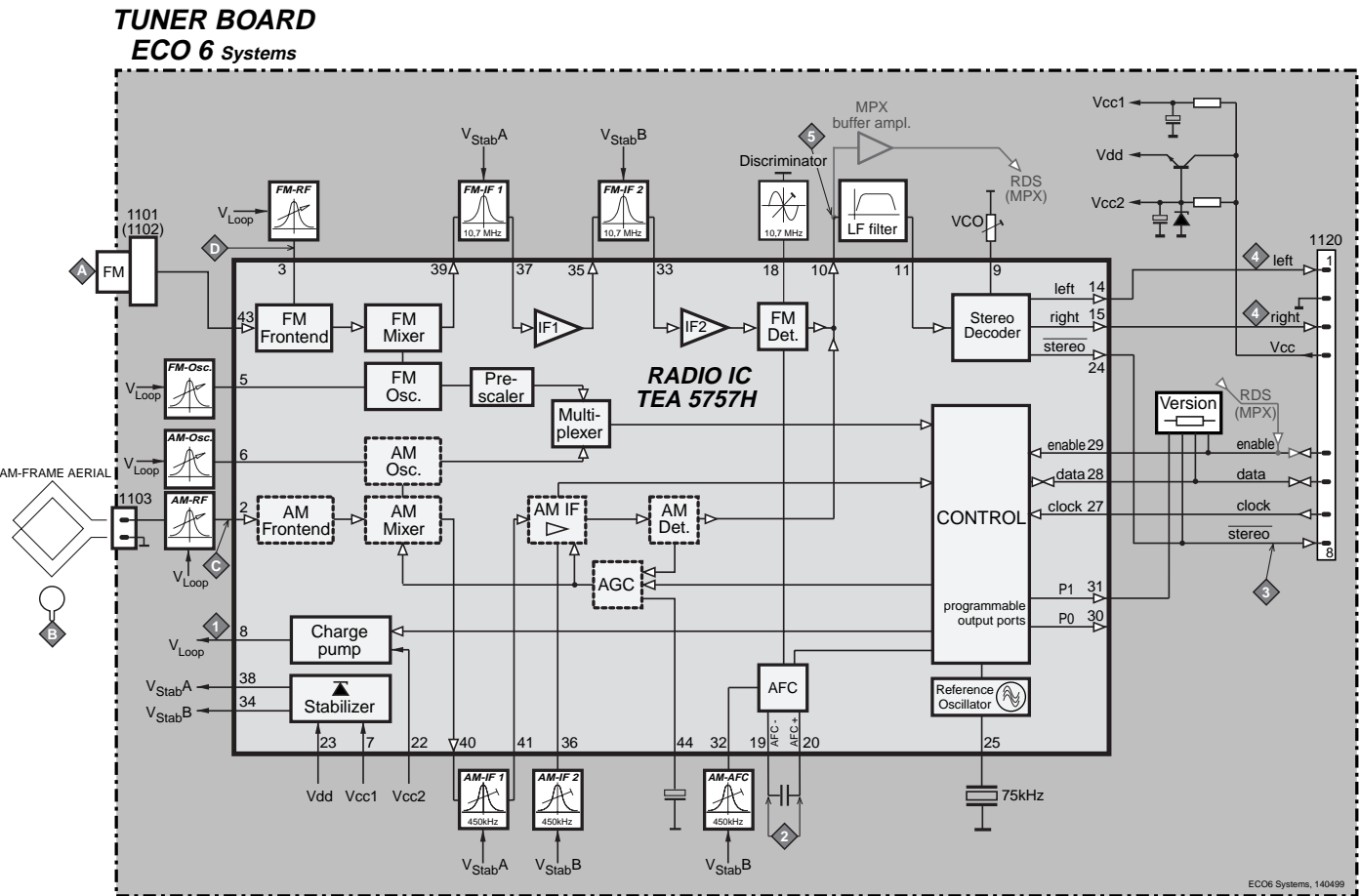
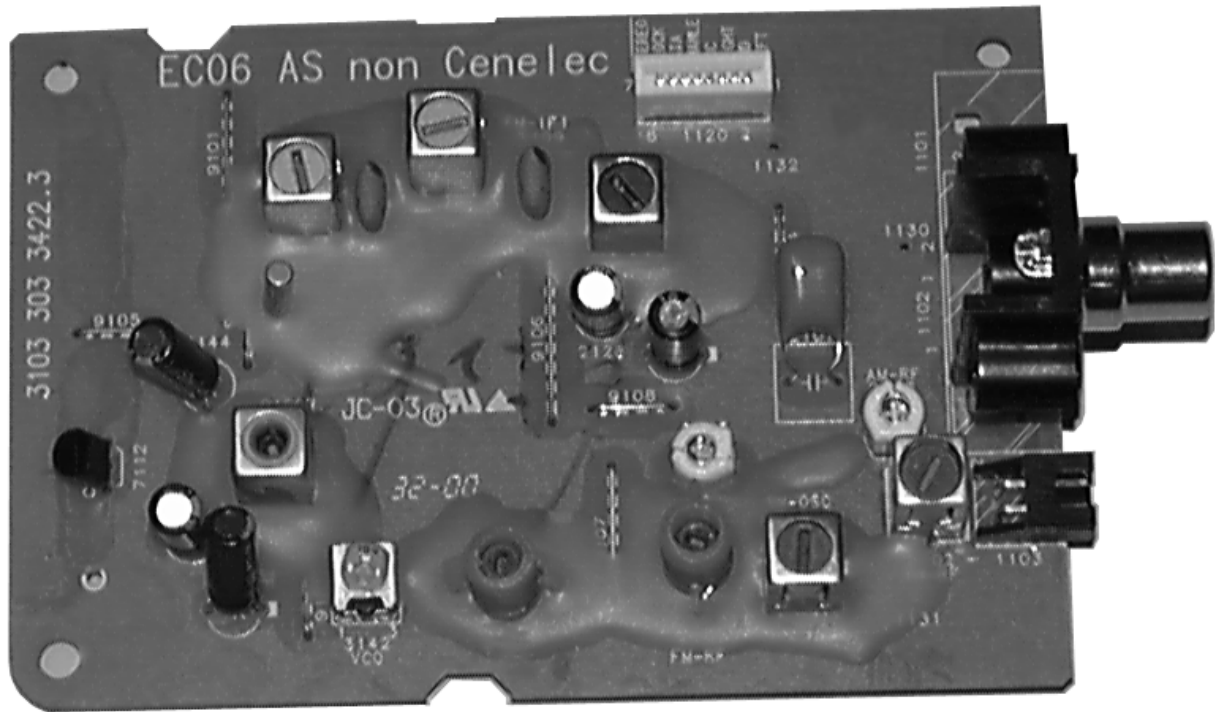
INTERNAL BLOCK DIAGRAM
POSITIVE VOLTAGE REGULATOR - IC KA7805



CIRCUIT DIAGRAM - FRONT BOARD (MCU PART)



BLOCK DIAGRAM



ECO6 Tuner Board

version: **SYSTEMS non-CENELEC**

TABLE OF CONTENTS

Blockdiagram7A-1

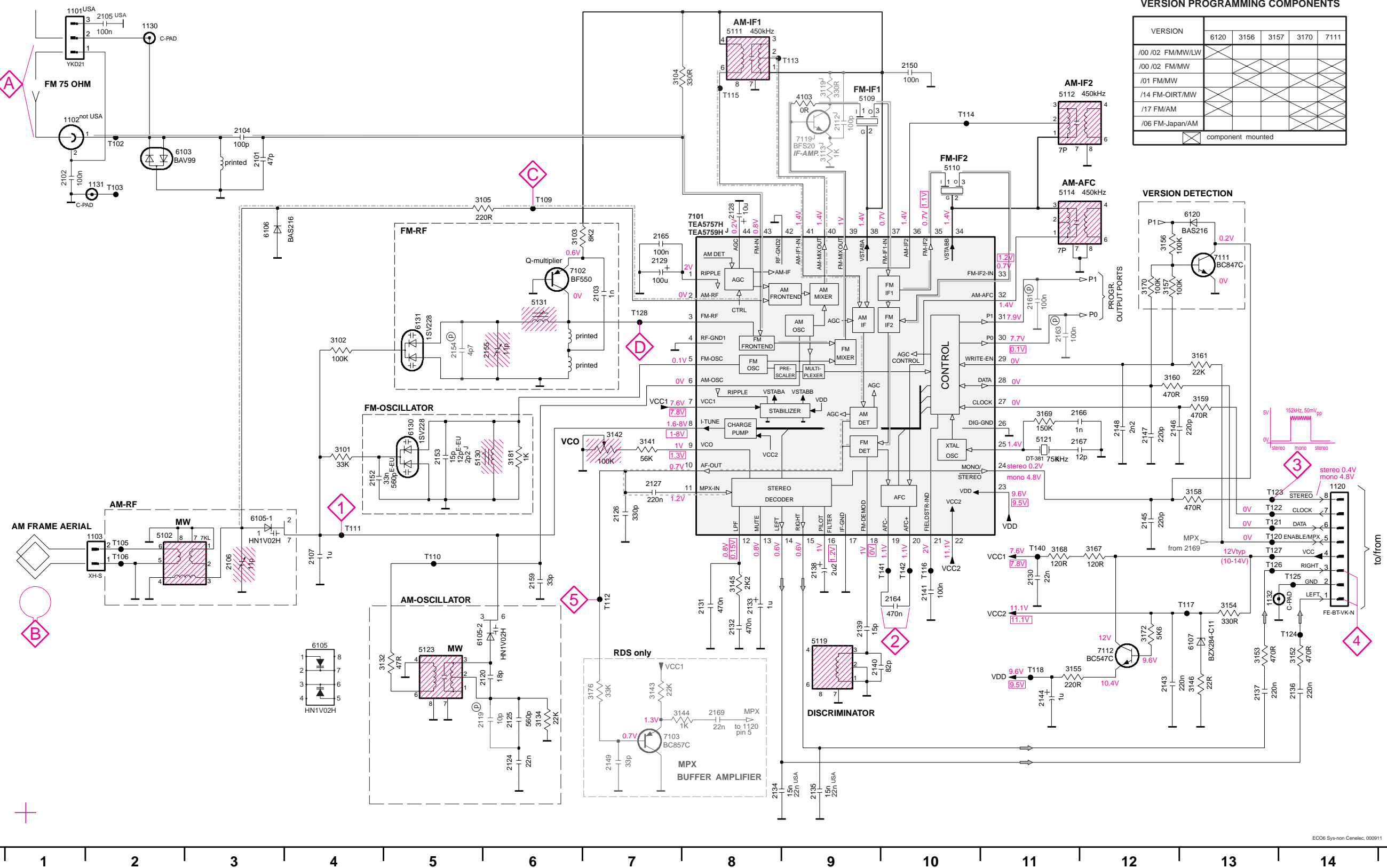
Schematic Diagram7A-2

Component Layout.....7A-3

Adjustment table7A-3

Electrical Partslist.....7A-4

TUNER BOARD ECO6 / SYSTEMS NON CENELEC



LEGEND

Ⓟ...for provision only

USA ... for USA version only

E-EU ... for East European version only

J ... for Japanese version only

...V FM mode stereo

...V MW mode

...V LW mode

voltages measured while set is tuned to a strong transmitter

EVM

Signal path

— FM

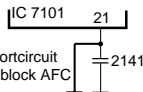
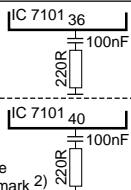
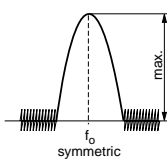

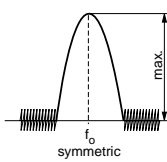
--- AM

--- MPX (Audio Frequency)

⇒ AF - left/right

1101 A1
1102 B1
1103 F2
1120 E14
1130 A2
1131 B2
1132 G13
2101 B3
2102 B1
2103 C7
2104 B3
2105 A2
2106 F3
2107 F4
2119 H6
2120 G6
2124 H6
2125 H6
2126 F7
2127 E7
2128 C8
2129 C7
2130 F11
2131 G8
2132 G8
2133 G8
2134 H8
2135 H9
2136 G14
2137 G13
2138 F9
2139 G9
2140 G9
2141 F10
2143 G12
2144 G11
2145 F12
2146 E12
2147 E12
2148 E12
2149 H7
2150 A10
2152 E4
2153 E5
2154 D5
2155 D5
2159 F6
2161 C11
2163 D11
2164 F10
2165 C7
2166 E11
2167 E11
2169 H8
3101 E4
3102 D4
3103 C6
3104 A7
3105 B6
3132 G5
3134 H6
3141 E7
3142 E7
3143 G7
3144 H7
3145 F8
3146 G13
3152 G14
3153 G13
3154 G13
3155 G11
3156 C12
3157 C12
3158 F13
3159 D13
3160 D12
3161 D13
3167 F12
3168 F11
3169 E11
3170 C12
3172 G12
3176 G7
3181 E6
5102 F2
5109 B9
5110 B10
5111 A8
5112 A11
5114 B11
5119 G9
5121 E11
5123 G5
5130 E5
5131 C6
5132 B2
6105-1 F3
6105-2 G5
6106 C3
6107 G13
6120 C13
6130 E5
6131 D5
7101 C8
7102 C6
7103 H7
7111 C13
7112 G12
T102 B2
T103 B2
T105 F2
T106 F2
T109 B6
T110 F5
T111 F4
T112 F7
T113 A8
T114 F10
T115 A8
T121 F13
T122 F13
T123 E13
T124 G14
T125 F14
T126 F13
T127 F13
T128 D7
T140 F11
T141 F10
T142 F10

TUNER ADJUSTMENT TABLE (ECO6 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 (65.81 - 74, 87.5 - 108MHz)			108MHz	5130	1	8V ±0.2V
			87.5MHz (65.81MHz)	check		4.3V ±0.5V (1.2V ±0.5V)
MW FM/AM-version, 10kHz grid 530 - 1700kHz			1700kHz	5123		8V ±0.2V
			530kHz	check		1.1V ±0.4V
FM/MW-version, 9kHz grid 531 - 1602kHz			1602kHz	5123		6.9V ±0.2V
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
MW FM/MW/LW- version, 9kHz grid 531 - 1602kHz			1602kHz	5123		8V ±0.2V
			531kHz	check		1.1V ±0.4V
FM IF						
FM	10.7MHz, 45mV continuous wave	D		5119	2	0 ± 3 mV DC
FM RF						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)	108MHz	A	108MHz	2155	4	MAX
	87.5MHz (65.81MHz)	mod=1kHz Δf=±22.5kHz	87.5MHz (65.81MHz)	5131		
VCO						
FM	98MHz, 1mV continuous wave	A	98MHz	3142	3	152kHz ±1kHz ¹⁾
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)	 see remark 2)	5111 5112	5	
AM AFC MW		C continuous wave V _{RF} = 2mV		5114		
AM RF ³⁾						
MW ⁴⁾ FM/MW/LW- and FM/MW-version (9kHz grid) 531 - 1602kHz	1494kHz	B 	1494kHz	2106	5	
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		
MW FM/AM-version, 10kHz grid 530 - 1700kHz	1500kHz		1500kHz	2106		
	560kHz		560kHz	5102		

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)

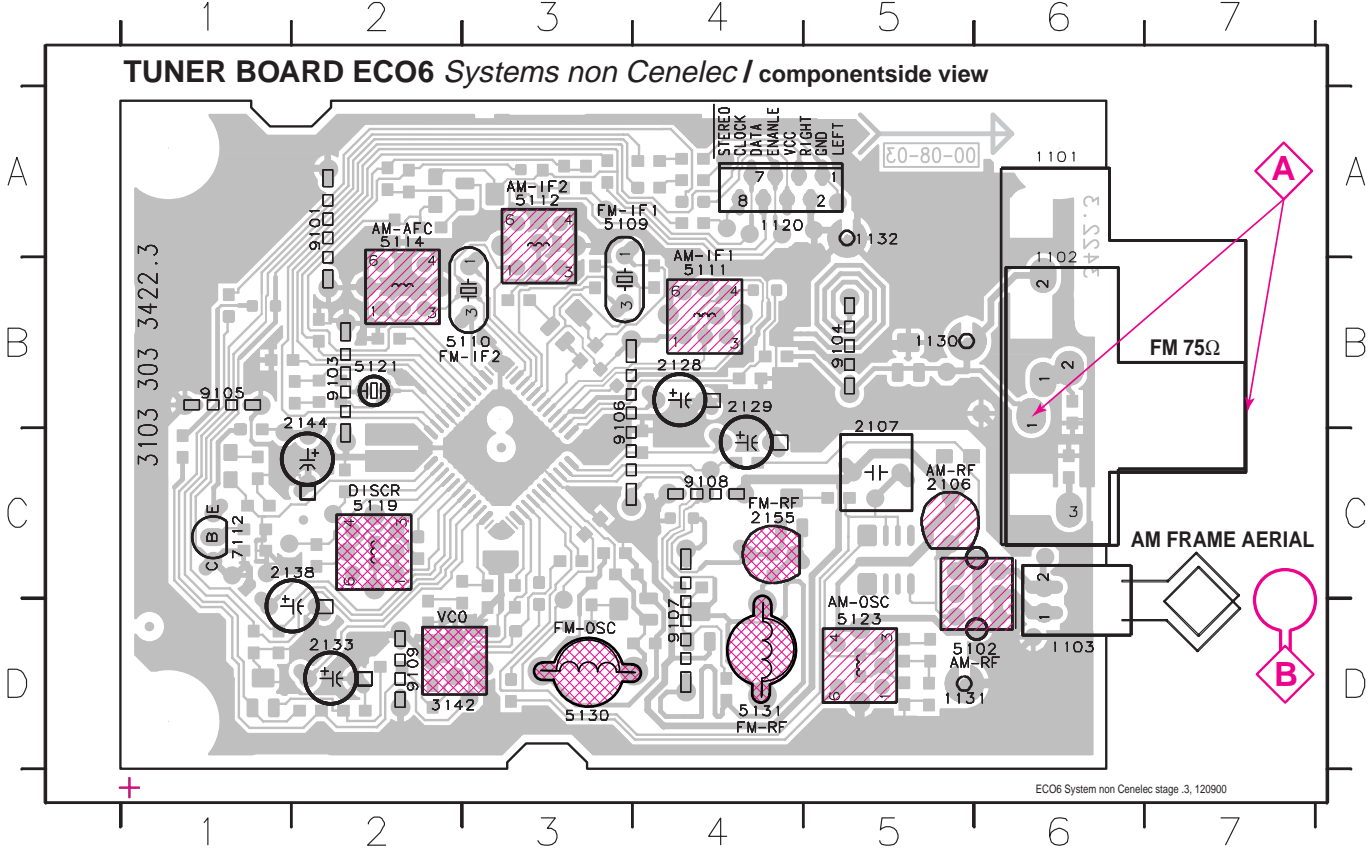
2) RC network serves for damping the IF-filter while adjusting the other one.

3) For AM RF adjustments the original frame antenna has to be used !

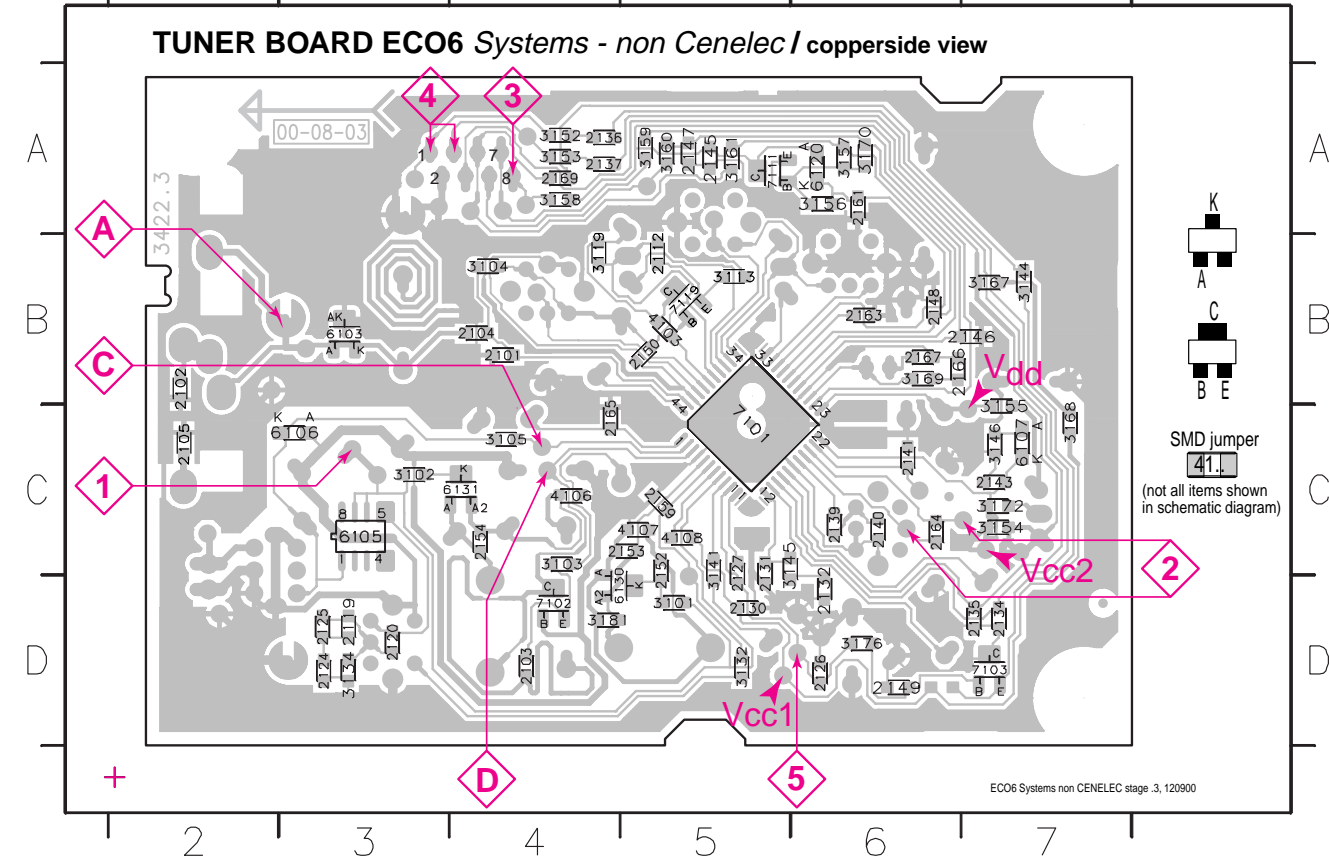
4) MW has to be aligned before LW.

↑ Repeat

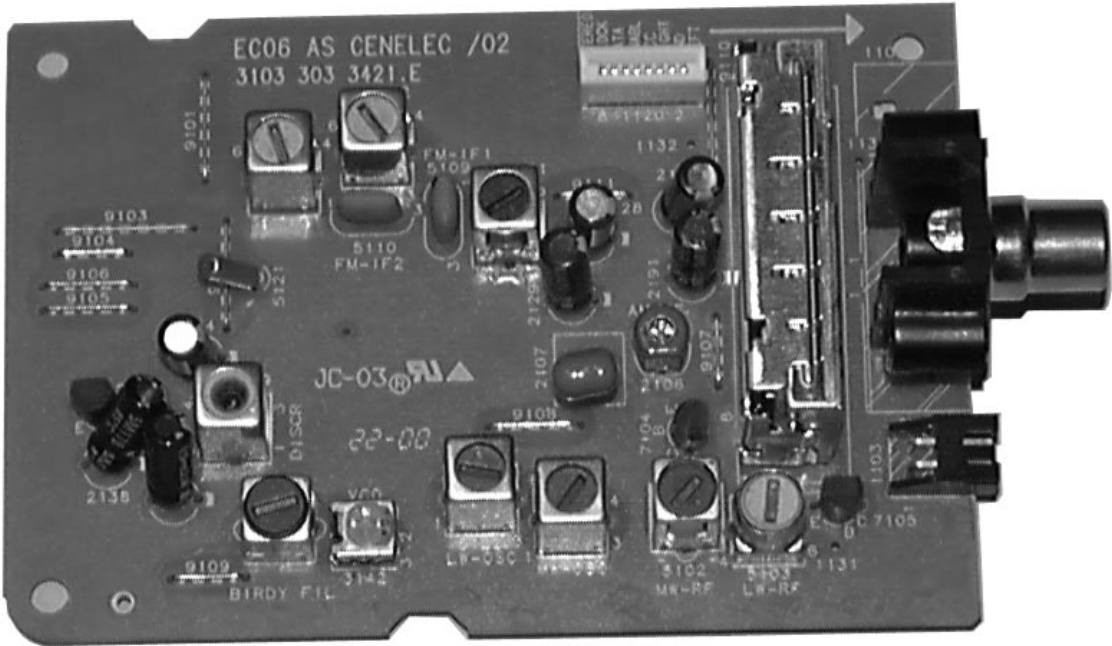
1101 A6 1120 A4 1132 A5 2128 C4 2138 C2 3142 D2 5110 B3 5114 A2 5123 D5 7112 C1 9104 B5 9107 D4
1102 B6 1130 B5 2106 C5 2129 B4 2144 B2 5102 D6 5111 B4 5119 C2 5130 D3 9101 A2 9105 B1 9108 C4
1103 D6 1131 D5 2107 B5 2133 D2 2155 C4 5109 A3 5112 A3 5121 B2 5131 D4 9103 B2 9106 B3 9109 D2



2101 B4 2119 D3 2130 D5 2137 A4 2146 B7 2153 C5 2165 C4 3103 C4 3134 D3 3152 A4 3158 A4 3169 B6 4106 C4 6107 C7 7103 D7
2102 B1 2120 D3 2131 C5 2139 C6 2147 A5 2154 C4 2166 B6 3104 B4 3141 C5 3153 A4 3159 A5 3170 A6 4107 C5 6120 A6 7111 A5
2103 D4 2124 D3 2132 D6 2140 C6 2148 B6 2159 C5 2167 B6 3105 C4 3143 D6 3154 C7 3160 A5 3172 C7 4108 C5 6130 D4 7119 B5
2104 B4 2125 D3 2134 D7 2141 C6 2149 D6 2161 A6 2169 A4 3113 B5 3144 B7 3155 C7 3161 A5 3176 D6 6103 B3 6131 C4
2105 C1 2126 D6 2135 D7 2143 C7 2150 B5 2163 B6 3101 D5 3119 B5 3145 C5 3156 A6 3167 B7 3181 D4 6105 C3 7101 C5
2112 B5 2127 C5 2136 A4 2145 A5 2152 C5 3102 C3 3132 D5 3146 C7 3157 A6 3168 C7 4103 B5 6106 C3 7102 D4



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



ECO6 Tuner Board

version: **SYSTEMS CENELEC**

TABLE OF CONTENTS

Blockdiagram.....7B-1

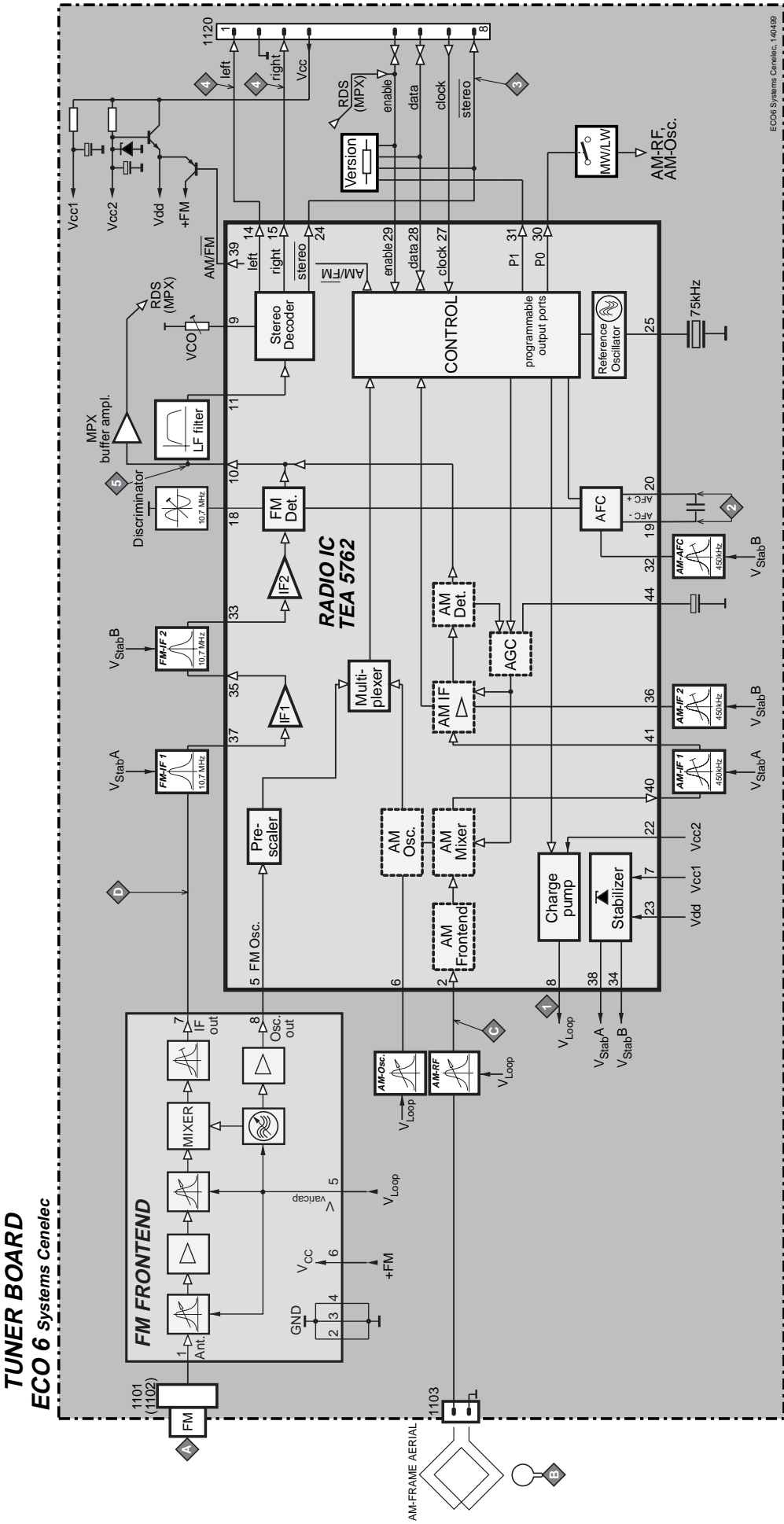
Schematic Diagram.....7B-2

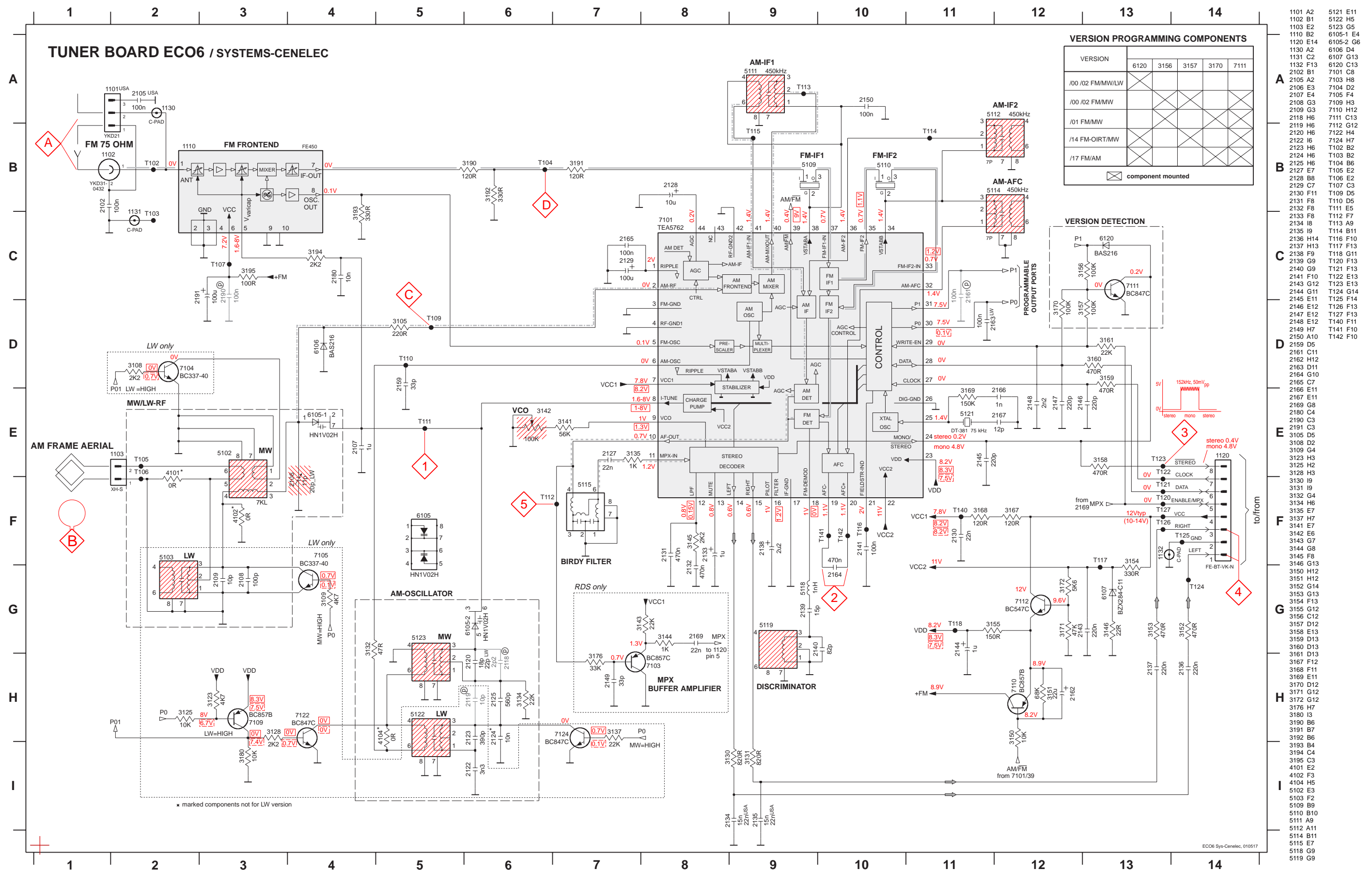
Component Layout.....7B-3

Adjustment table7B-3

Electrical Partslist.....7B-4

BLOCK DIAGRAM





1101 A2
1102 B1
1103 E2
1110 B2
1120 E14
1130 A2
1131 C2
1132 F13
1102 B1
2105 A2
2106 E3
2107 E4
2108 G3
2109 G3
2118 H6
2119 H6
2120 H6
2122 I6
2123 H6
2124 H6
2125 H6
2127 E7
2128 B8
2129 C7
2130 F11
2131 F8
2132 F8
2133 F8
2134 I8
2135 I9
2136 H14
2137 H13
2138 F9
2139 G9
2140 G9
2141 F10
2143 G12
2144 G11
2145 E11
2146 E12
2147 E12
2148 E12
2149 H7
2150 A10
2159 D5
2161 C1
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

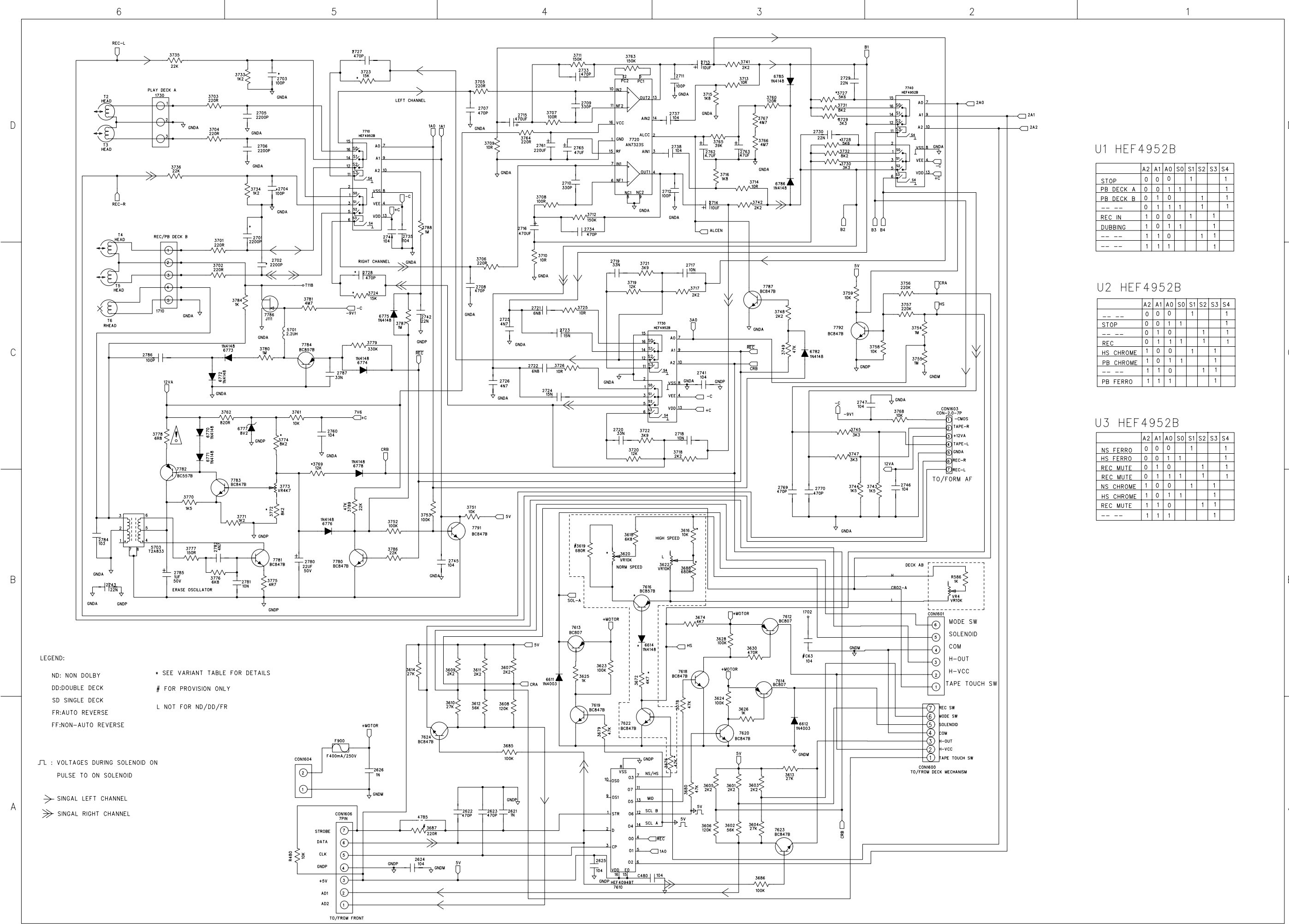
5121 E11
5122 H5
5123 G5
6105-1 E4
6105-2 G6
6106 D4
6107 G13
6120 C13
7101 C8
7103 H8
7104 D2
7105 F4
7109 H3
7110 H12
7111 C13
7112 G12
7122 H4
7124 H7
T102 B2
T103 B2
T104 B6
T105 E2
T106 E2
T107 C3
T109 D5
T110 D5
T111 E5
T112 F7
T113 A9
T114 B11
T116 F10
T117 F13
T118 G11
T120 F13
T121 F13
T122 E13
T123 E13
T124 G14
T125 F14
T126 F13
T127 F13
T140 F11
T141 F10
T142 F10

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

ECO6 Sys Cenelec. 190599

Repeat

CIRCUIT DIAGRAM - TAPE BOARD





3CDC-LC-MP3CD2002

(3 Disc Carousel Changer+MP3 Board) Layout stage .2

TABLE OF CONTENTS

Service Hints	10-2
Wiring Diagram	10-4
Blockdiagram	10-5

CD PART

Component Layout Main Board	10-6
Circuit Diagram	10-7

MP3 PART

Component Layout Main Board	10-8
Circuit Diagram	10-9

Exploded View	10-10
Partslist	10-12



Service hints

CAUTION

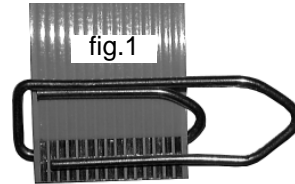
CHARGED CAPACITORS ON THE SERVO BOARD MAY DAMAGE THE CD DRIVE ELECTRONICS WHEN CONNECTING A NEW CD MECHANISM. THAT'S WHY, BESIDES THE SAFETY MEASURES LIKE

- **SWITCH OFF POWER SUPPLY**
- **ESD PROTECTION**

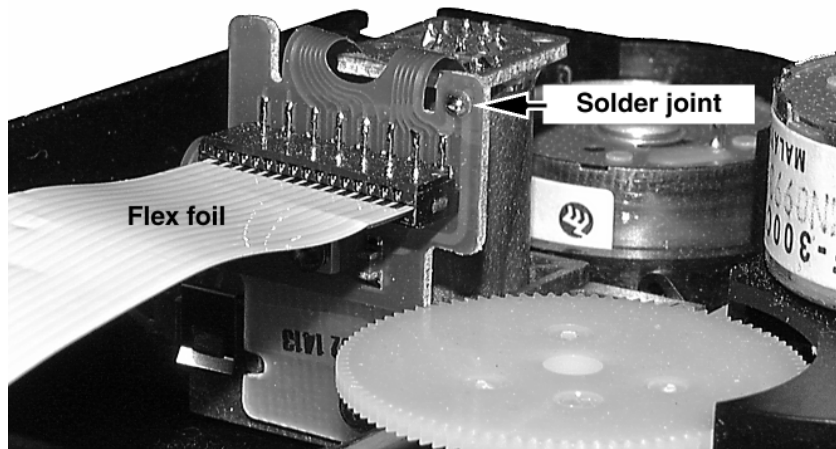
ADDITIONAL ACTIONS MUST BE TAKEN BY THE REPAIR TECHNICIAN.

The following steps have to be done when replacing the CD mechanism:

1. Disconnect flexfoil cable from the old CD drive
2. Put a paperclip on the flexfoil to short-circuit the contacts (fig.1)
3. Remove the old CD drive
4. Remove paperclip from the flexfoil and connect it to the new drive
5. Position the new CD drive in its studs
6. Remove solder joint from the Laserunit



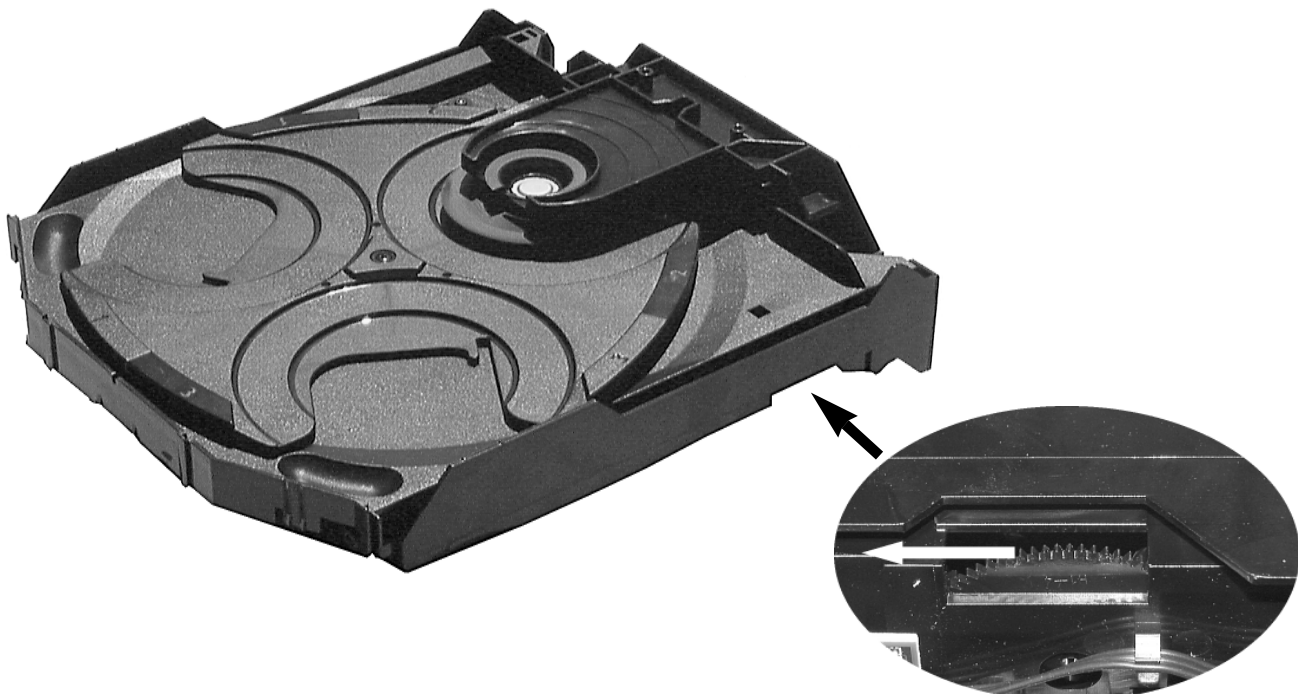
Attention: The laser diode of this CD drive is protected against ESD by a solder joint which shortcircuits the laserdiode to ground.
For proper functionality of the CD drive this solder joint must be removed **after** connection the drive to the set.



Emergency open

In case of a Supply fault, the tray can be opened manually.

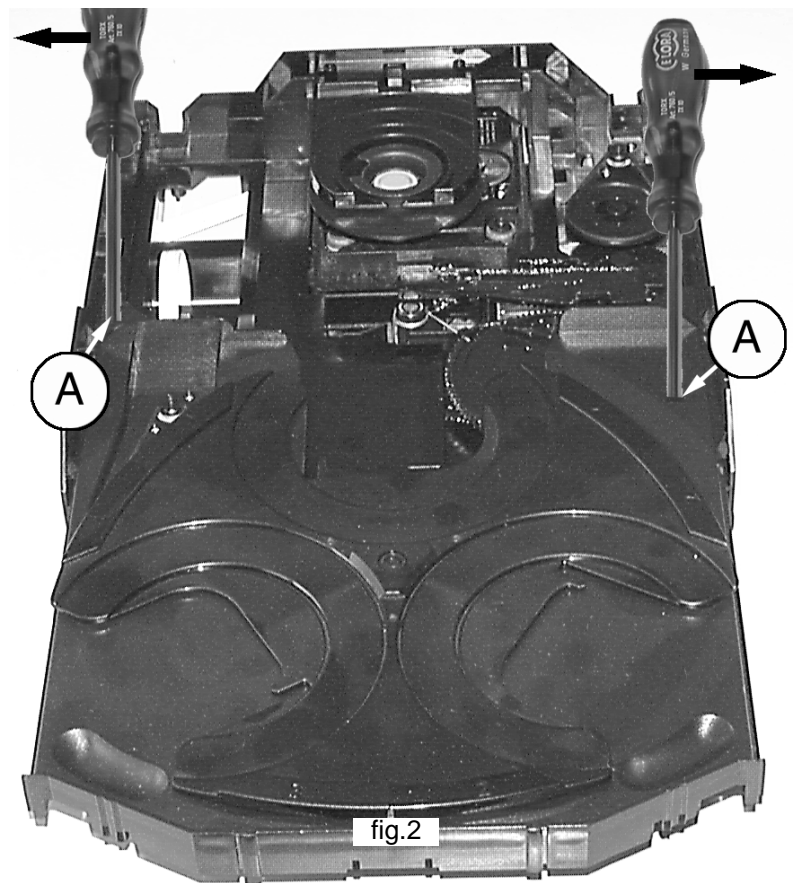
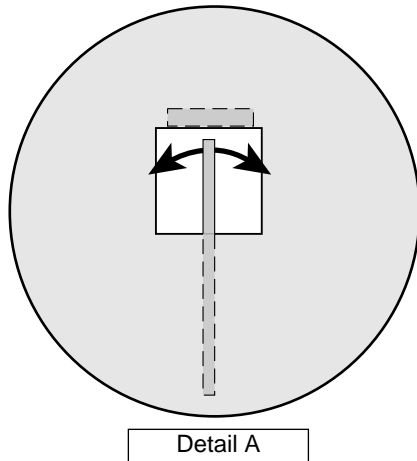
1. Remove the top cover of the set to get access to the Changer Module.
2. Turn gearwheel clockwise (as shown in picture below).



Service hints

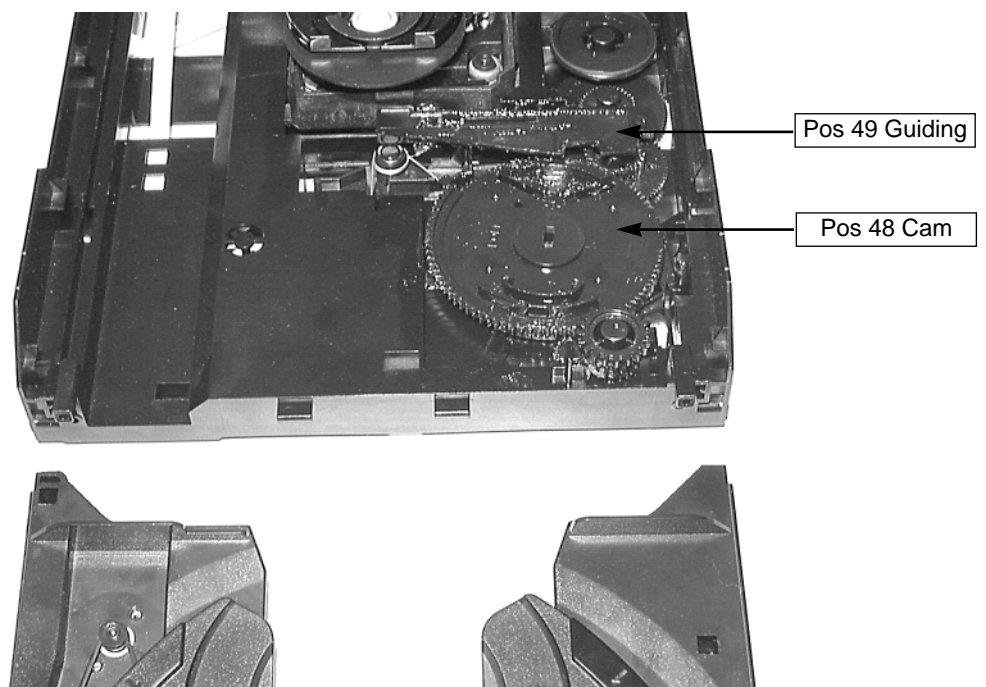
Dismantling of Tray

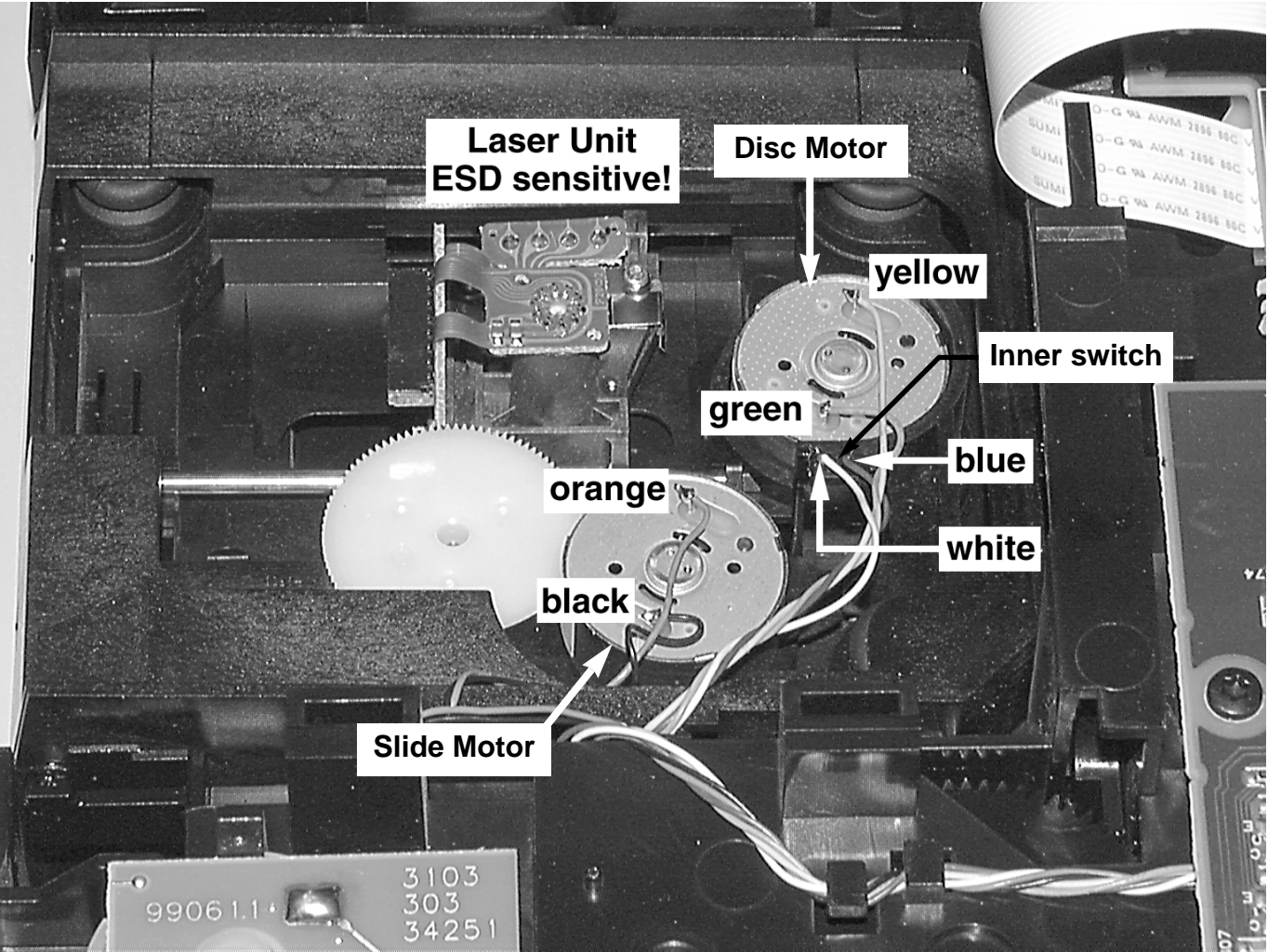
1. Open the tray.
2. Release 2x catch as shown in fig. 2 and Detail A
3. Pull tray out.



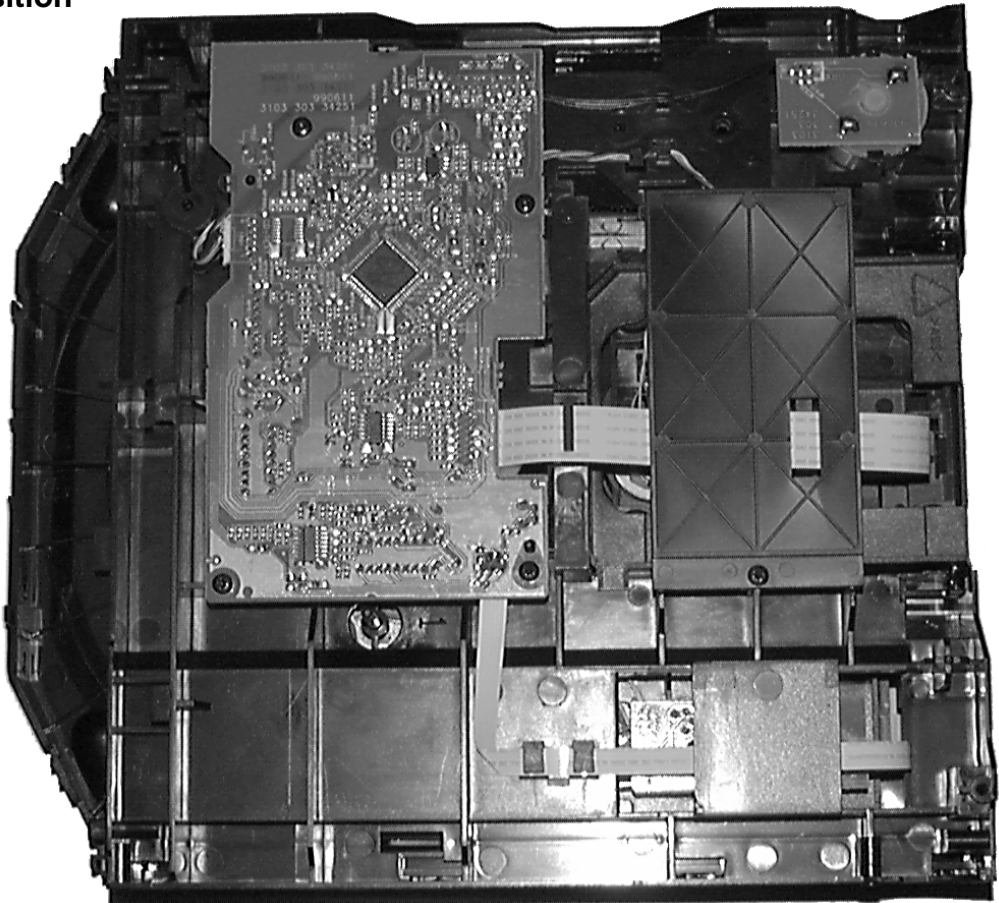
Assembling of Tray

1. Turn Cam (pos. 48) clockwise to end position.
2. If necessary - move Guiding (pos. 49) to the right end position.
3. Insert the Tray.

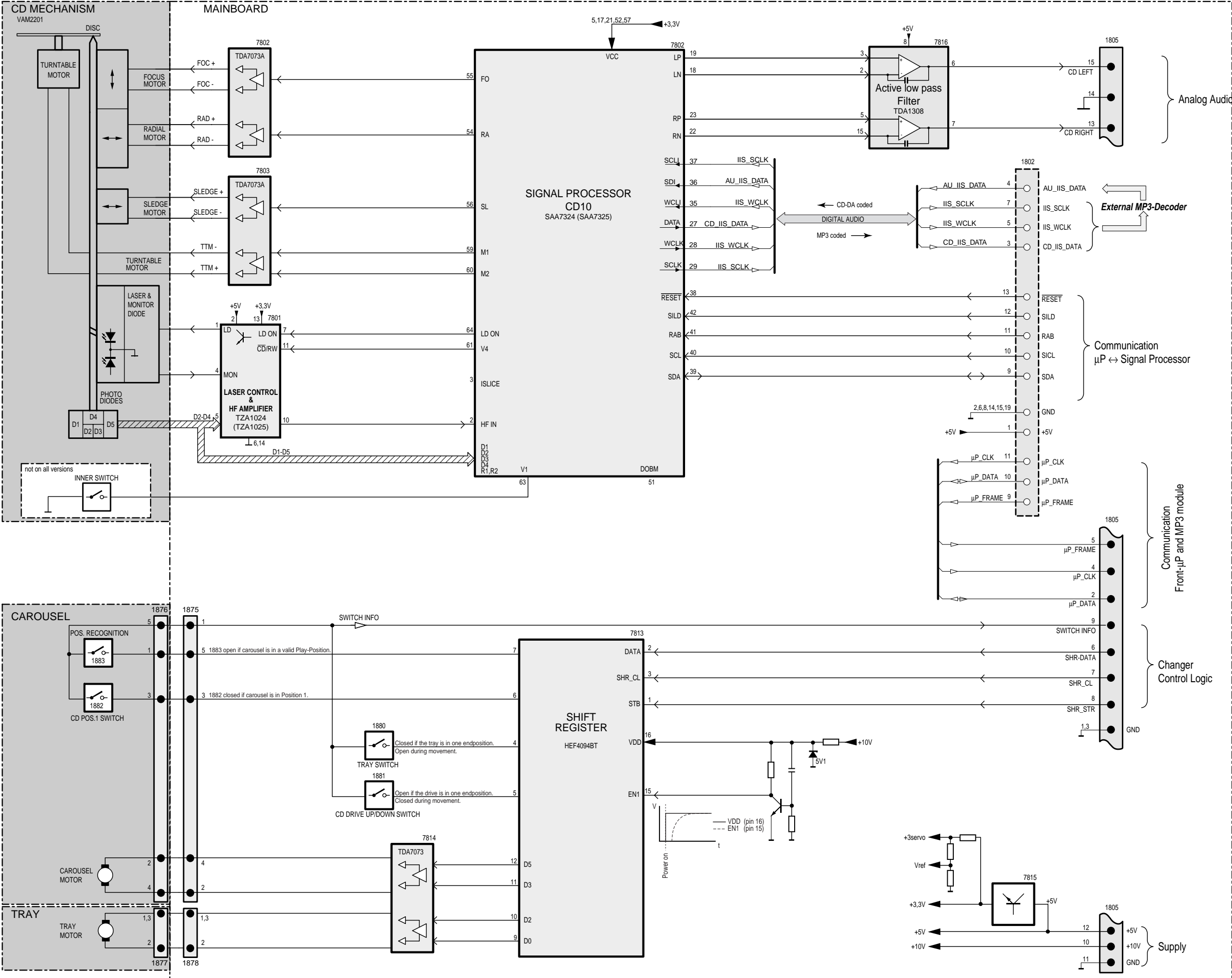




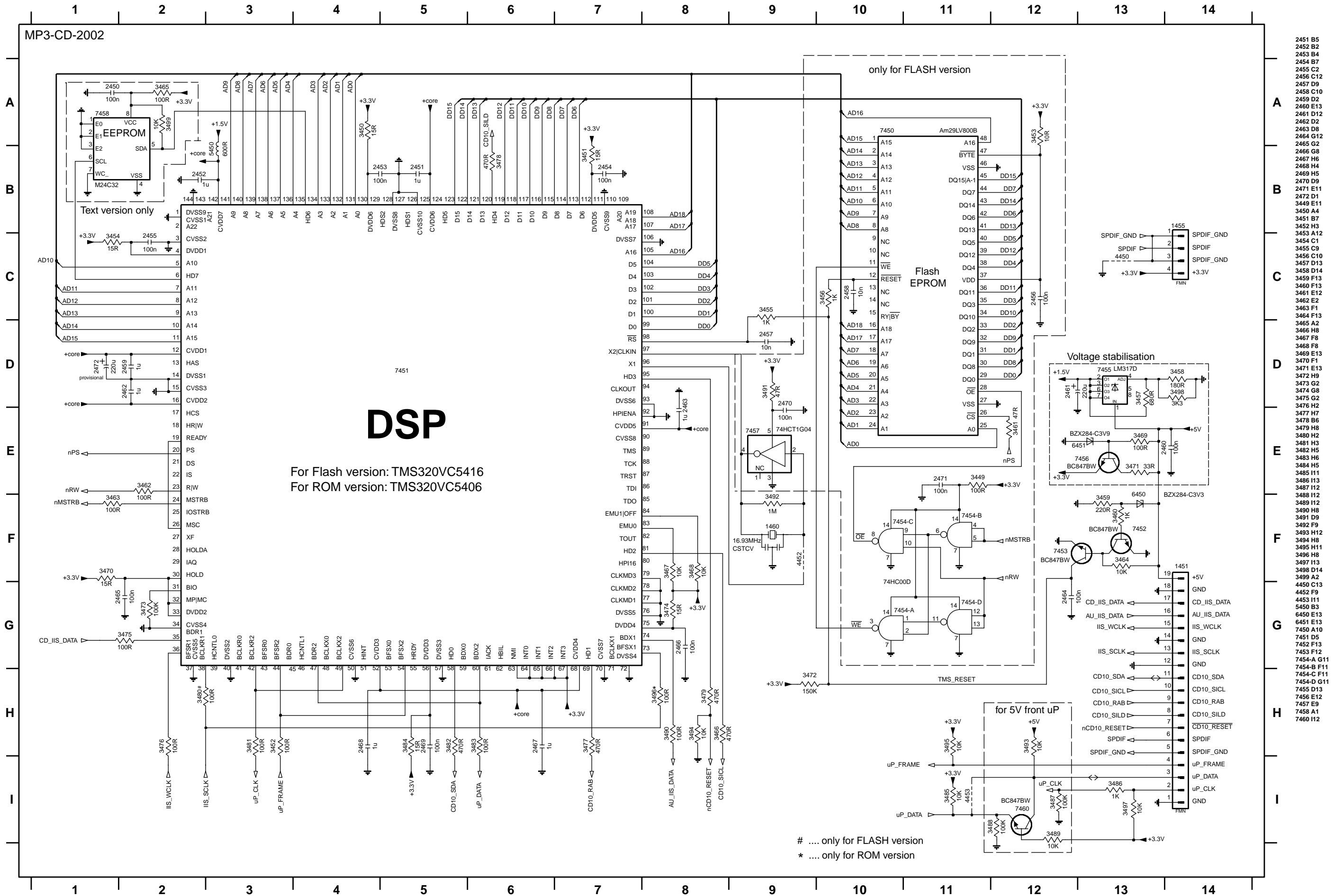
Service Position



BLOCK DIAGRAM 3CDC-LC MP3 Version







Circuit details continued:**• Low power standby feature**

An additional small standby transformer, reduces power consumption in standby-mode.

In case power is switched on, the control line ECO is low → relay 1210 is activated → contacts 1 and 2 are closed → transformer 5001 is connected to mains.

When the set is switched off (standby) the control line ECO is high → relay 1210 is not activated → mainstransformer is disconnected. Via standby transformer and rectifiers 6210-6214 the supply voltage LOW_PWR_SUP is substituted. This voltage is always available and so the microprocessor is kept running.

• DC voltages +A1, +B1, +C1

These voltages supply the Super Class G amplifier, described on previous page.

The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several “tricky” details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

Generation of +A1

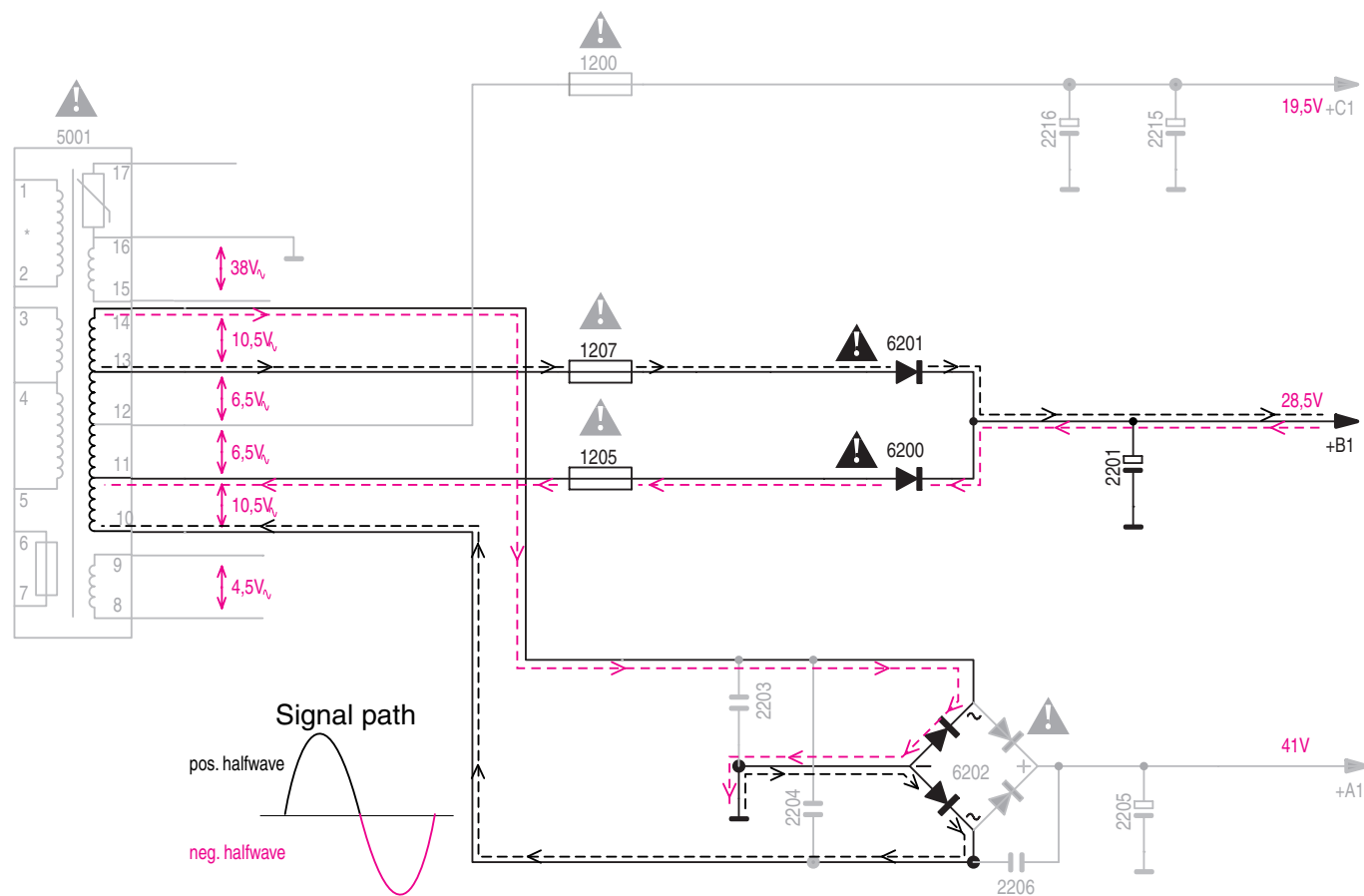
Common full wave rectifying with bridge rectifier 6202, using 100% secondary winding of mains transformer (pin 10-14).

Generation of +B1

The supply for +B1 consists of one full wave rectifier:

– 2 diodes of bridge rectifier 6202, with 6200(6220 in parallel) 6201(6221 in parallel) for generation of +B1 using approx. 70% secondary winding of mains transformer (pin 10-13 respectively pin 11-14).

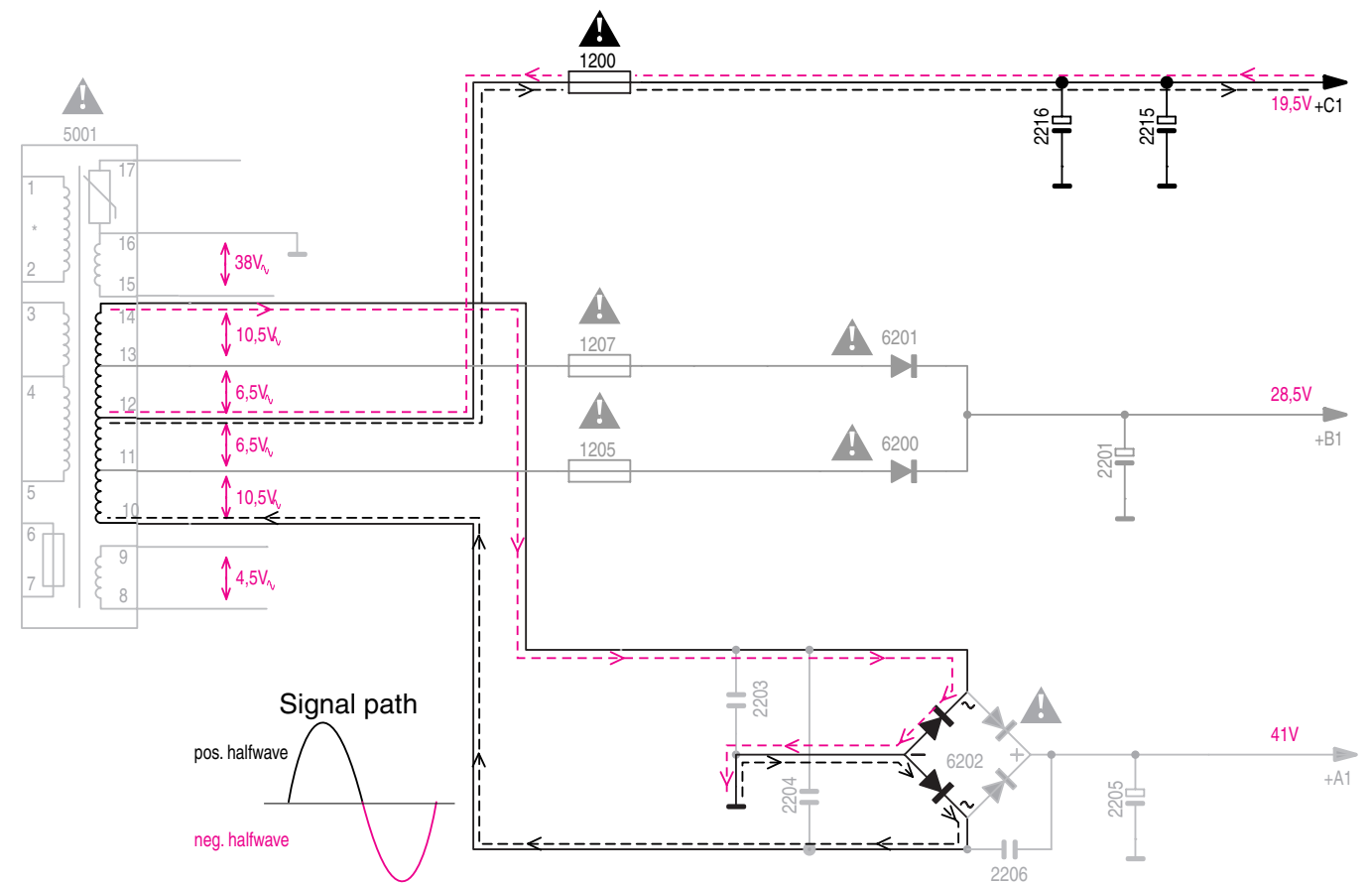
As example for generation of +B1 see picture 1.



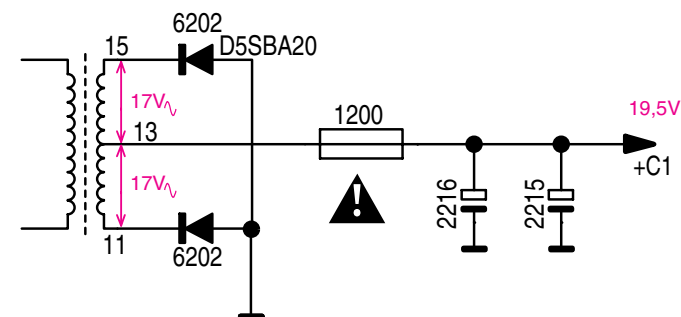
picture 1

Generation of +C1

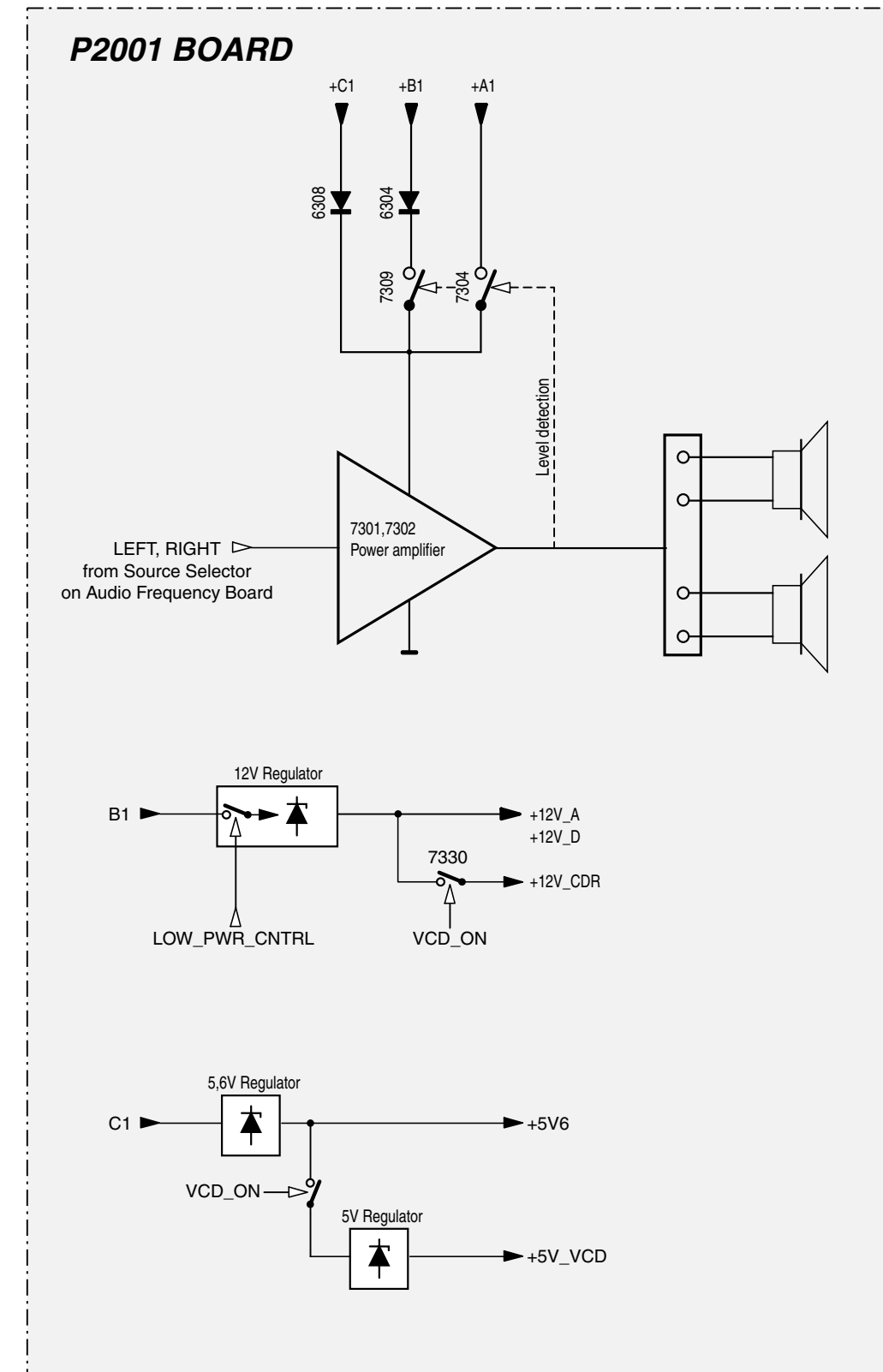
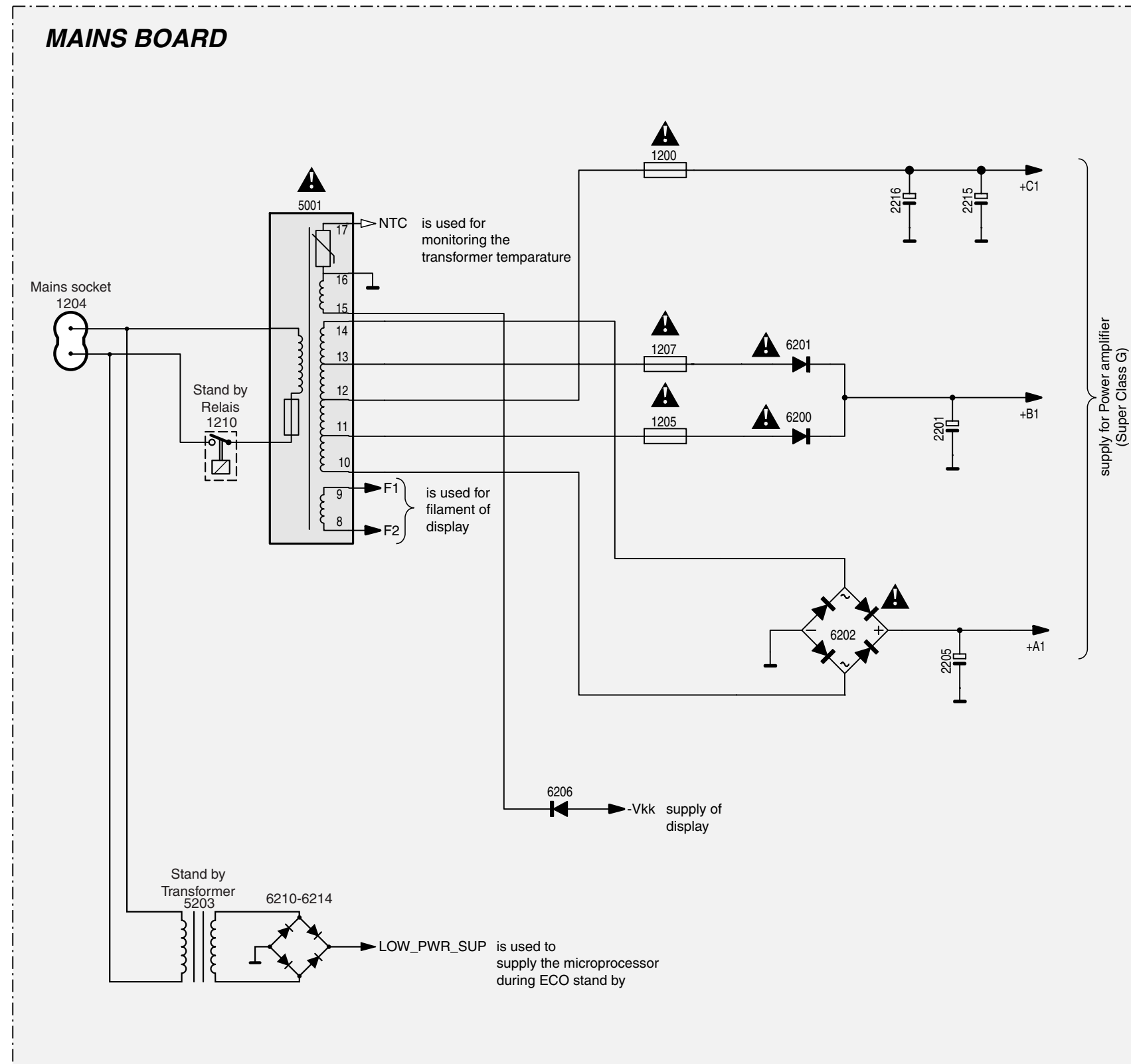
Full wave rectifying with 2 diodes of bridge rectifier 6202, using 50% secondary winding of mains transformer (pin 13-15/13-11). See picture 2 below.



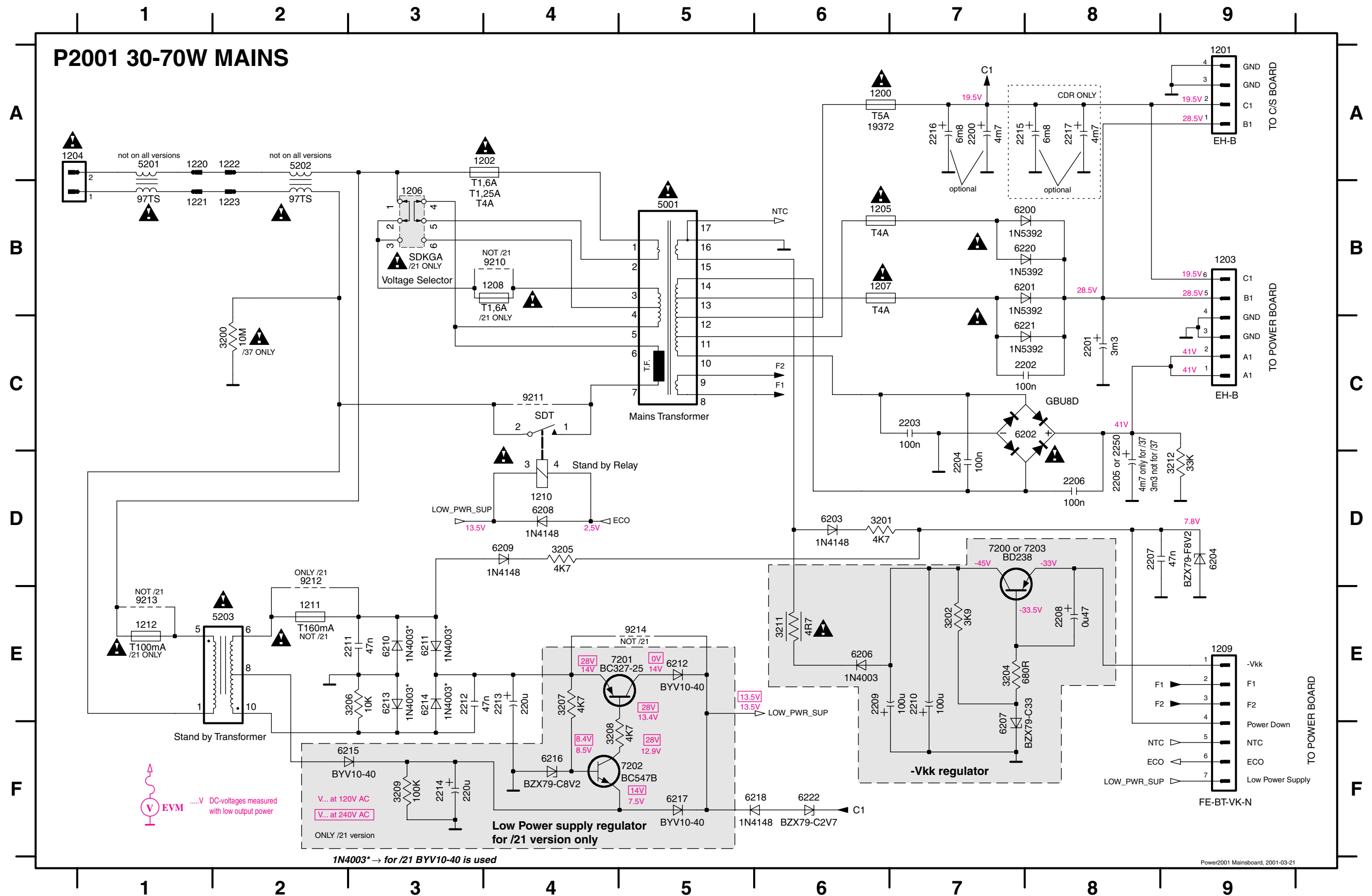
simplified:



picture 2



1200 A6	1207 B6	1222 A2	2204 D7	2210 E7	2216 A7	3204 E7	3211 E6	6201 B8	6208 D4	6214 E3	6221 C8	9208 B2	9215 F6
1201 A9	1208 B4	1223 B2	2205 D8	2211 E3	2217 A8	3205 E4	3212 D9	6202 C8	6209 E4	6215 F3	7200 D7	9210 B4	
1202 A4	1209 E9	2200 A7	2206 D8	2212 E3	2250 D8	3206 E3	5001 C5	6203 D6	6210 E3	6216 F4	7201 E4	9211 C4	
1203 B9	1210 D4	2201 C8	2207 D8	2213 E4	3200 C2	3207 E4	5202 A2	6204 D9	6211 E3	6217 F5	7202 F5	9212 D2	
1205 B6	1211 E2	2202 C8	2208 E8	2214 F3	3201 D6	3208 F4	5203 E1	6206 E6	6212 E5	6218 F6	7203 D7	9213 E1	
1206 B3	1212 E1	2203 C7	2209 E6	2215 A7	3202 E7	3209 F3	6200 B8	6207 F7	6213 E3	6220 B8	9206 A2	9214 E5	

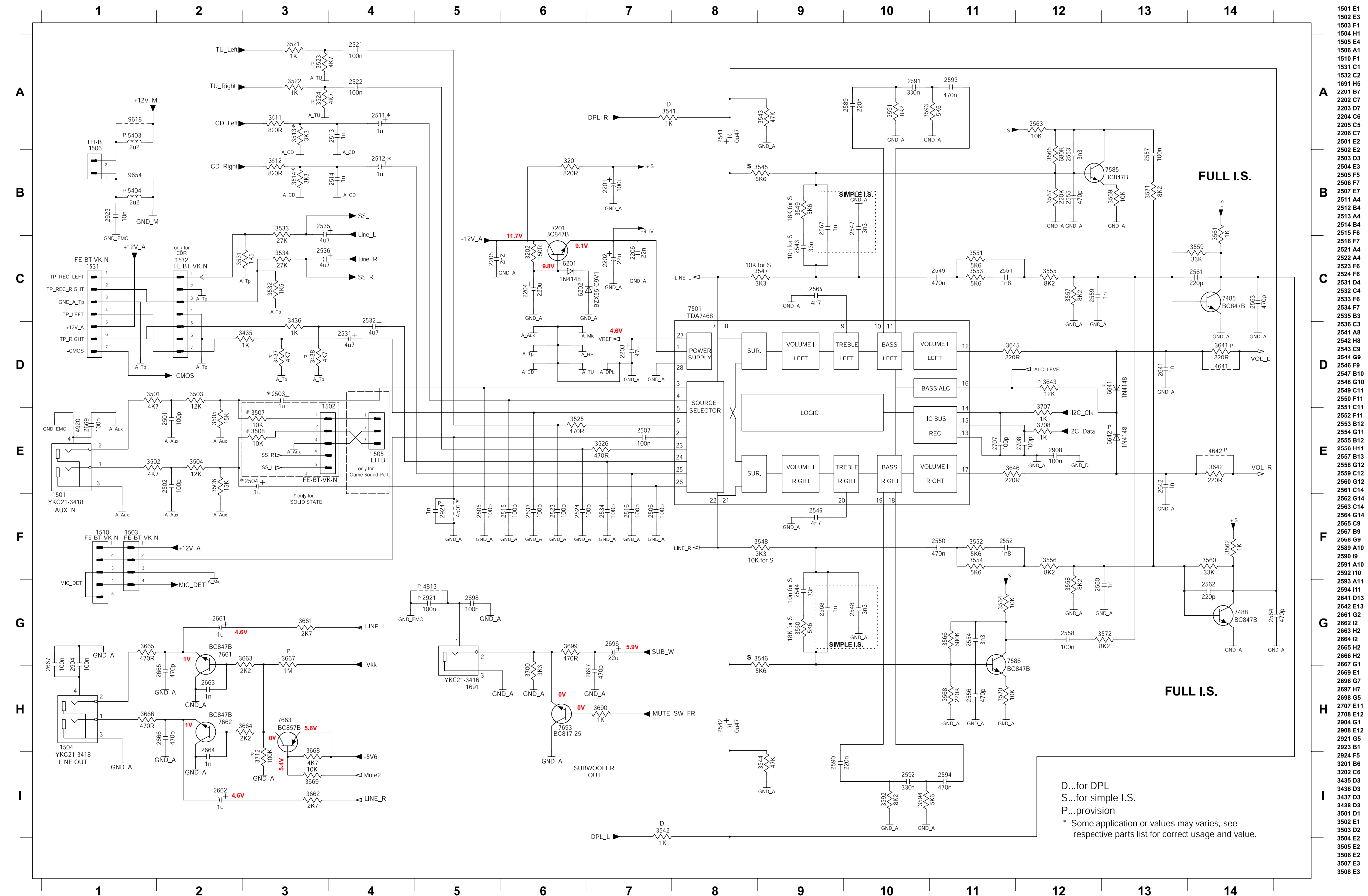


The schematic diagram illustrates the internal circuitry of the P2001 30-70W amplifier. It is organized into several functional blocks:

- Power Section:** Includes a +12V Regulator, a 5V6 Regulator, and a 5V Regulation section. It features transistors like 7303, 7306, 7305, 7310, 7311, 7312, 7315, 7316, 7317, 7318, 7319, 7320, 7321, 7322, 7323, 7324, 7325, 7326, 7327, 7328, 7329, 7330, 7331, 7332, 7333, 7334, 7335, 7336, 7337, 7338, 7339, 7340, 7341, 7342, 7343, 7344, 7345, 7346, 7347, 7348, 7349, 7350, 7351, 7352, 7353, 7354, 7355, 7356, 7357, 7358, 7359, 7360, 7361, 7362, 7363, 7364, 7365, 7366, 7367, 7368, 7369, 7370, 7371, 7372, 7373, 7374, 7375, 7376, 7377, 7378, 7379, 7380, 7381, 7382, 7383, 7384, 7385, 7386, 7387, 7388, 7389, 7390, 7391, 7392, 7393, 7394, 7395, 7396, 7397, 7398, 7399, 7400, 7401, 7402, 7403, 7404, 7405, 7406, 7407, 7408, 7409, 7410, 7411, 7412, 7413, 7414, 7415, 7416, 7417, 7418, 7419, 7420, 7421, 7422, 7423, 7424, 7425, 7426, 7427, 7428, 7429, 7430, 7431, 7432, 7433, 7434, 7435, 7436, 7437, 7438, 7439, 7440, 7441, 7442, 7443, 7444, 7445, 7446, 7447, 7448, 7449, 7450, 7451, 7452, 7453, 7454, 7455, 7456, 7457, 7458, 7459, 7460, 7461, 7462, 7463, 7464, 7465, 7466, 7467, 7468, 7469, 7470, 7471, 7472, 7473, 7474, 7475, 7476, 7477, 7478, 7479, 7480, 7481, 7482, 7483, 7484, 7485, 7486, 7487, 7488, 7489, 7490, 7491, 7492, 7493, 7494, 7495, 7496, 7497, 7498, 7499, 7500.

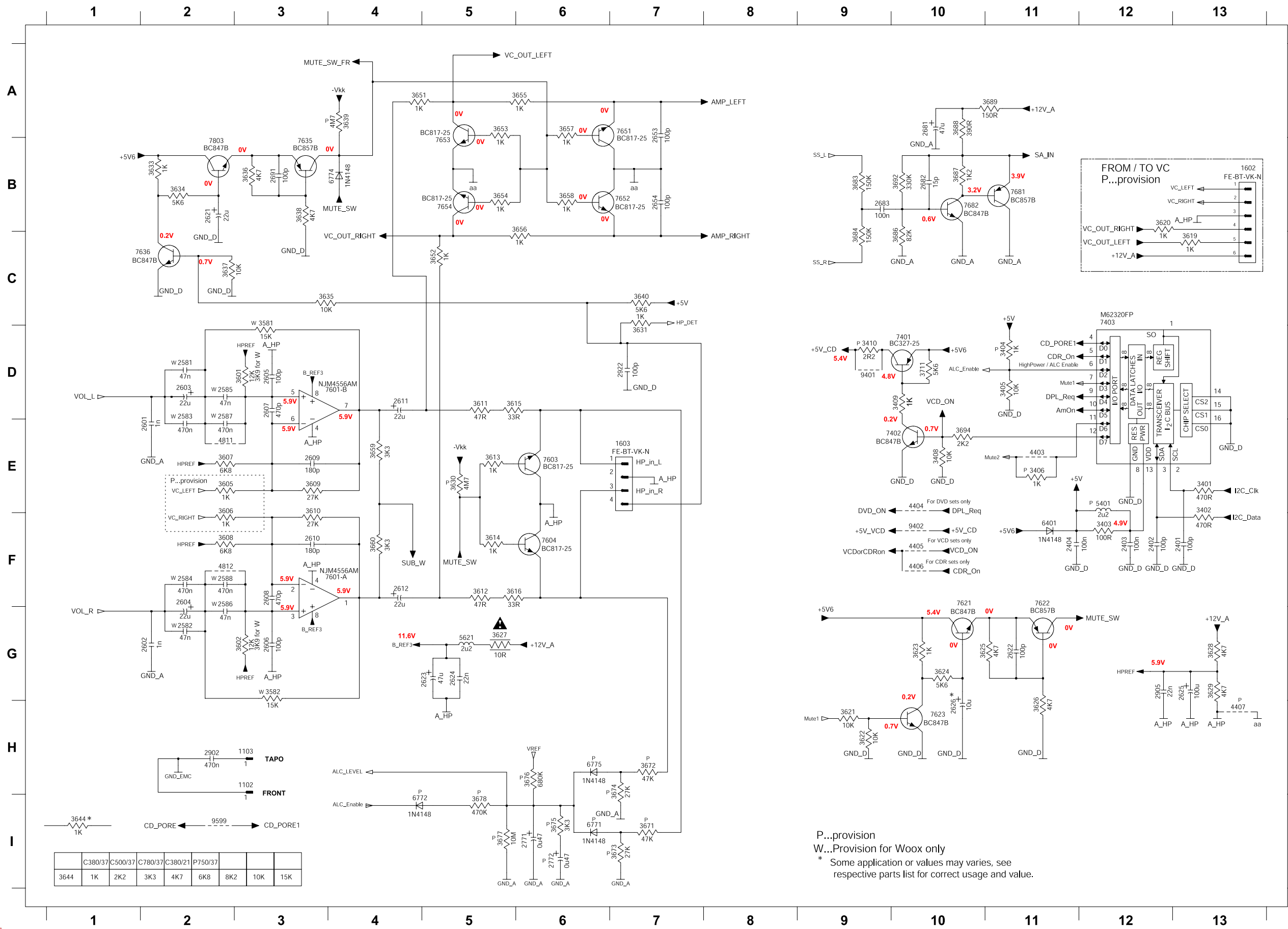
0300 D10
1300 E9
1301 B9
1302 A1
1303 C1
1305 D3
1306 D1
1307-A F14
1308 F12
1310 G1
1312 H1
1313 B9
1314 G1
1315 D1
1316 B1
2307 D8
2308 G8
2309 B9
2309 E9
2310 B9
2315 D9
2316 G9
2317 F5
2318 F13
2319 F3
2319 F3
2320 F3
2321 F3
2322 F3
2323 F3
2324 B14
2325 B1
2326 A3
2326 A3
2327 B6
2328 D4
2329 E5
2330 E5
2331 E6
2332 F5
2333 F7
2334 H6
2335 H5
2336 F4
2337 E4
2337 F4
2338 F4
2340 H4
2341 I7
2342 I8
2343 D3
2344 I4
2348 B7
3300 G6
3301 F14
3306 G7
3307 D8
3308 D8
3309 B10
3310 F10
3311 C10
3312 C10
3313 A5
3314 A14
3315 A12
3316 A12
3317 A3
3318 B13
3319 B13
3320 B5
3321 B5
3322 B2
3323 B6
3324 B4
3325 B4
3326 B12
3327 B6
3328 C14
3330 C14
3331 C6
3332 C3
3333 B6
3335 C5
3336 C6
3337 D2
3338 D2
3340 D14
3341 F14
3343 F3
3344 E6
3345 F2
3346 G2
3347 G2
3348 G4
3349 H4
3350 H5
3351 H5
3352 I5
3353 E3
3355 E3
3356 E4
3357 F5
3358 F5
3359 I3
3360 H3
3361 F3
3362 H3
3363 I3
3364 H12
3365 H12
3366 H3
3367 H14
3368 G6
3369 H7
3370 I7
3371 H8
3372 H7
3373 H10
3374 H4
3375 H3
3376 H7
3377 A10
3378 A10
3379 A10
3380 A7
3381 A8
3382 A8
3383 A8
3389 B7
3391 I8
3392 A2
3393 A4
3394 A9
3395 A5
3396 A4
3397 H4
3398 A4
5300 F10
5301 C10
5302 F10
6300 E10
6301 E12
6302 E13

SOURCE SELECTION & SOUND PROCESSING CIRCUIT



1501 E1 3511 A3
1502 E3 3512 B3
1503 F1 3513 A3
1504 H1 3514 B3
1505 E4 3521 A3
1506 A1 3522 A3
1510 F1 3523 A3
1531 C1 3524 A3
1532 C2 3525 E6
1691 H5 3526 E7
2201 B7 3531 C2
2202 C7 3532 C3
2203 D7 3533 B3
2204 C6 3534 C3
2205 C5 3541 A7
2206 C7 3542 I7
2501 E2 3543 A9
2502 E2 3544 I9
2503 D3 3545 B9
2504 E3 3546 G9
2505 F5 3547 C9
2506 F7 3548 F9
2507 E7 3549 B9
2511 A4 3550 G9
2512 B4 3551 C11
2513 A4 3552 F11
2514 B4 3553 C11
2515 F6 3554 F11
2516 F7 3555 C12
2521 A4 3556 F12
2522 A4 3557 C12
2523 F6 3558 G12
2524 F6 3559 C14
2531 D4 3560 F14
2532 C4 3561 B14
2533 F6 3562 F14
2534 F7 3563 A12
2535 B3 3564 G11
2536 C3 3565 B12
2541 A8 3566 G11
2542 H8 3567 B12
2543 C9 3568 H11
2544 G9 3569 B13
2545 G9 3570 H11
2547 B10 3571 B13
2548 G10 3572 G13
2549 C11 3591 A10
2550 F11 3592 I10
2551 C11 3593 A10
2552 F11 3594 I10
2553 B12 3641 D14
2554 H11 3642 E14
2555 B12 3643 D12
2556 H11 3644 D11
2557 B13 3646 E11
2558 G12 3661 G3
2559 C12 3662 I3
2560 G12 3663 G3
2561 C14 3664 H3
2562 G14 3665 G1
2563 C14 3666 H1
2564 G14 3667 G3
2565 C9 3668 I3
2567 B9 3669 I3
2568 G9 3690 H7
2569 A10 3699 G6
2590 I9 3700 H6
2591 A10 3707 E12
2592 I10 3708 E12
2593 A11 3712 I3
2594 I11 4501 F5
2641 D13 4641 D14
2642 E13 4642 E14
2661 G2 4813 G5
2662 I2 4920 A1
2663 H2 5403 A1
2664 I2 5404 B1
2665 H2 6201 C6
2666 H2 6202 C6
2667 G1 6641 D13
2669 E1 6642 E13
2696 G7 7201 B6
2697 H7 7485 C14
2698 G5 7488 G14
2707 E11 7501 C8
2708 E12 7585 B13
2904 G1 7586 G11
2908 E12 7661 G2
2921 G5 7662 H2
2923 B1 7663 H3
2924 F5 7693 H6
3201 B6 9618 A1
3202 C6 9654 B1
3435 D3 3437 D3
3437 D3 3438 D3
3501 D1 3502 E1
3502 E1 3503 E2
3504 E2 3505 E2

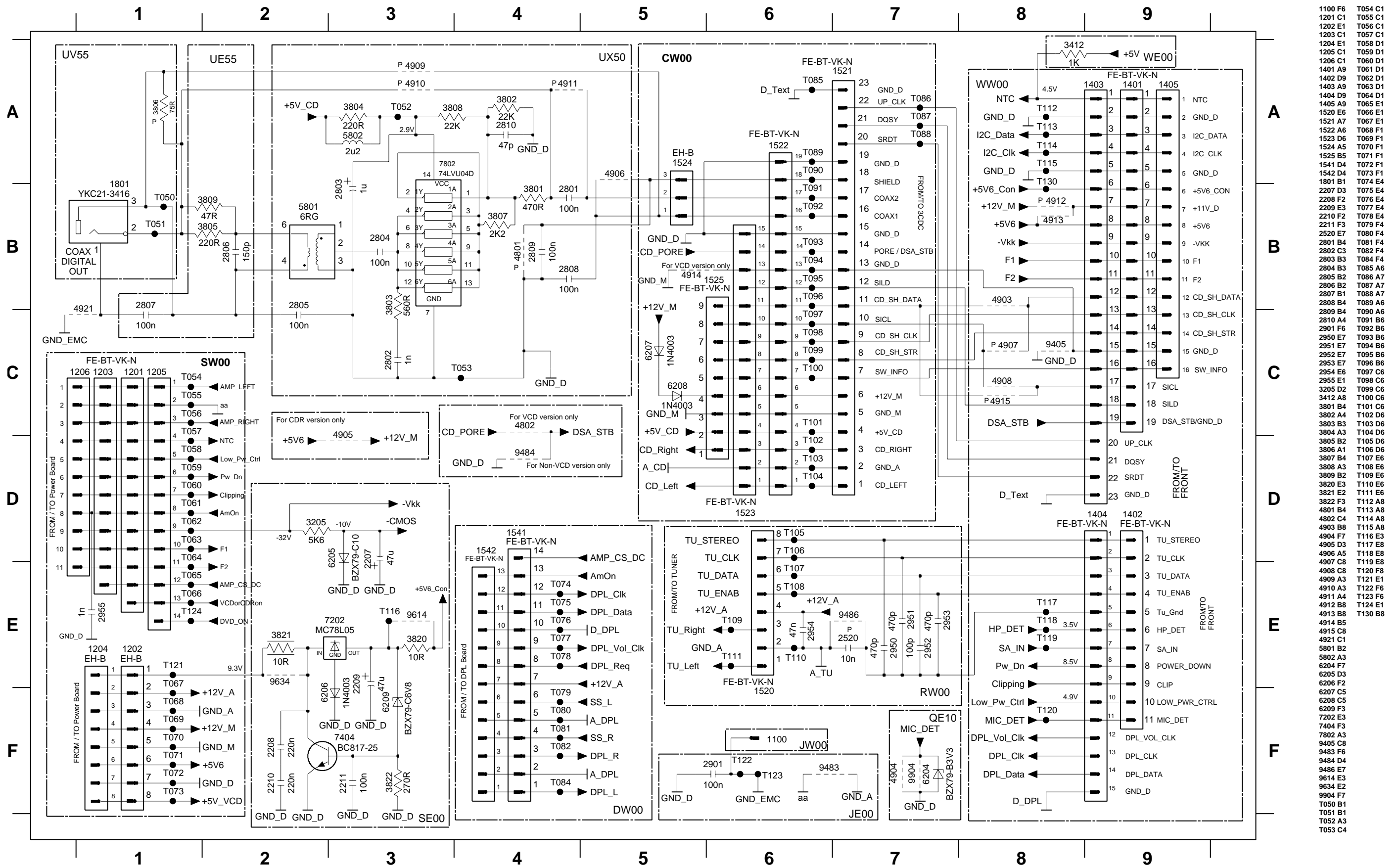
HEADPHONE AMPLIFIER & I²C EXPANDER CIRCUIT



- 1102 H3
- 1103 H3
- 1602 B13
- 1603 E7
- 2401 F13
- 2402 F12
- 2403 F12
- 2404 F11
- 2581 D2
- 2582 G2
- 2583 D2
- 2584 F2
- 2585 D2
- 2586 F2
- 2587 D2
- 2588 F2
- 2601 E2
- 2602 G2
- 2603 D2
- 2604 F2
- 2605 D3
- 2606 G3
- 2607 D3
- 2608 F3
- 2609 E3
- 2610 F3
- 2611 D4
- 2612 F4
- 2621 B2
- 2622 G11
- 2623 G5
- 2624 G5
- 2625 G13
- 2626 H10
- 2653 A7
- 2654 B7
- 2681 A10
- 2682 B10
- 2683 B9
- 2691 B3
- 2771 I6
- 2772 I6
- 2902 H2
- 2905 G12
- 2922 D7
- 3401 E13
- 3402 E13
- 3403 F12
- 3404 D11
- 3405 D11
- 3406 E11
- 3408 E10
- 3409 D10
- 3410 D9
- 3581 D3
- 3582 G3
- 3601 D3
- 3602 G3
- 3605 E2
- 3606 F2
- 3607 E2
- 3608 F2
- 3609 E3
- 3610 F3
- 3611 D5
- 3612 F5
- 3613 E5
- 3614 F5
- 3615 D5
- 3616 F5
- 3619 C13
- 3620 B12
- 3621 H9
- 3622 H9
- 3623 G10
- 3624 G10
- 3625 G10
- 3626 H11
- 3627 G5
- 3628 G13
- 3629 G13
- 3630 E5
- 3631 D7
- 3633 B2
- 3634 B2
- 3635 C3
- 3636 B3
- 3637 C2
- 3638 B3
- 3639 A4
- 3640 C7
- 3644 I1
- 3651 A4
- 3652 C5
- 3653 A5
- 3654 B5
- 3655 A6
- 3656 C6
- 3657 A6
- 3658 B6
- 3659 E4
- 3660 F4
- 3671 I7
- 3672 H7
- 3673 I7
- 3674 H7
- 3675 I6
- 3676 H6
- 3677 I5
- 3678 I5
- 3683 B9
- 3684 C9
- 3686 C10
- 3687 B10
- 3688 A10
- 3689 A11
- 3692 B10
- 3694 E10
- 3711 D10
- 4403 E11
- 4404 E10
- 4405 F10
- 4406 F10
- 4407 H13
- 4811 E2
- 4812 F2
- 5401 E12
- 5621 G5
- 6401 F11
- 6771 I6
- 6772 I4
- 6774 B4
- 6775 H6
- 7401 D10
- 7402 E10
- 7403 C12
- 7601-A G3
- 7601-B D3
- 7603 E6
- 7604 F6
- 7621 F10
- 7622 F11
- 7623 H10
- 7635 B3
- 7636 C2
- 7651 A7
- 7652 B7
- 7653 B5
- 7654 B5
- 7681 B11
- 7682 B10
- 7803 B2
- 9401 D9
- 9402 F10
- 9599 I2

P...provision
W...Provision for Woox only
* Some application or values may varies, see respective parts list for correct usage and value.

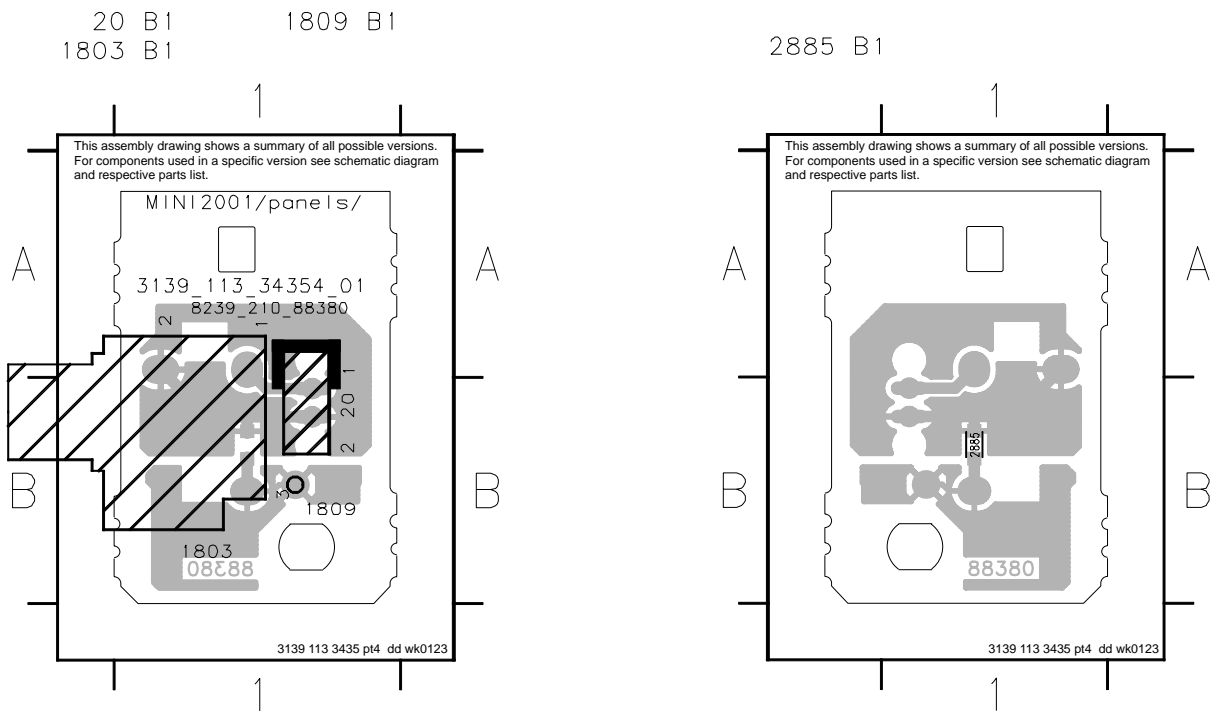
DIGITAL OUT & INTERCONNECTION CIRCUIT



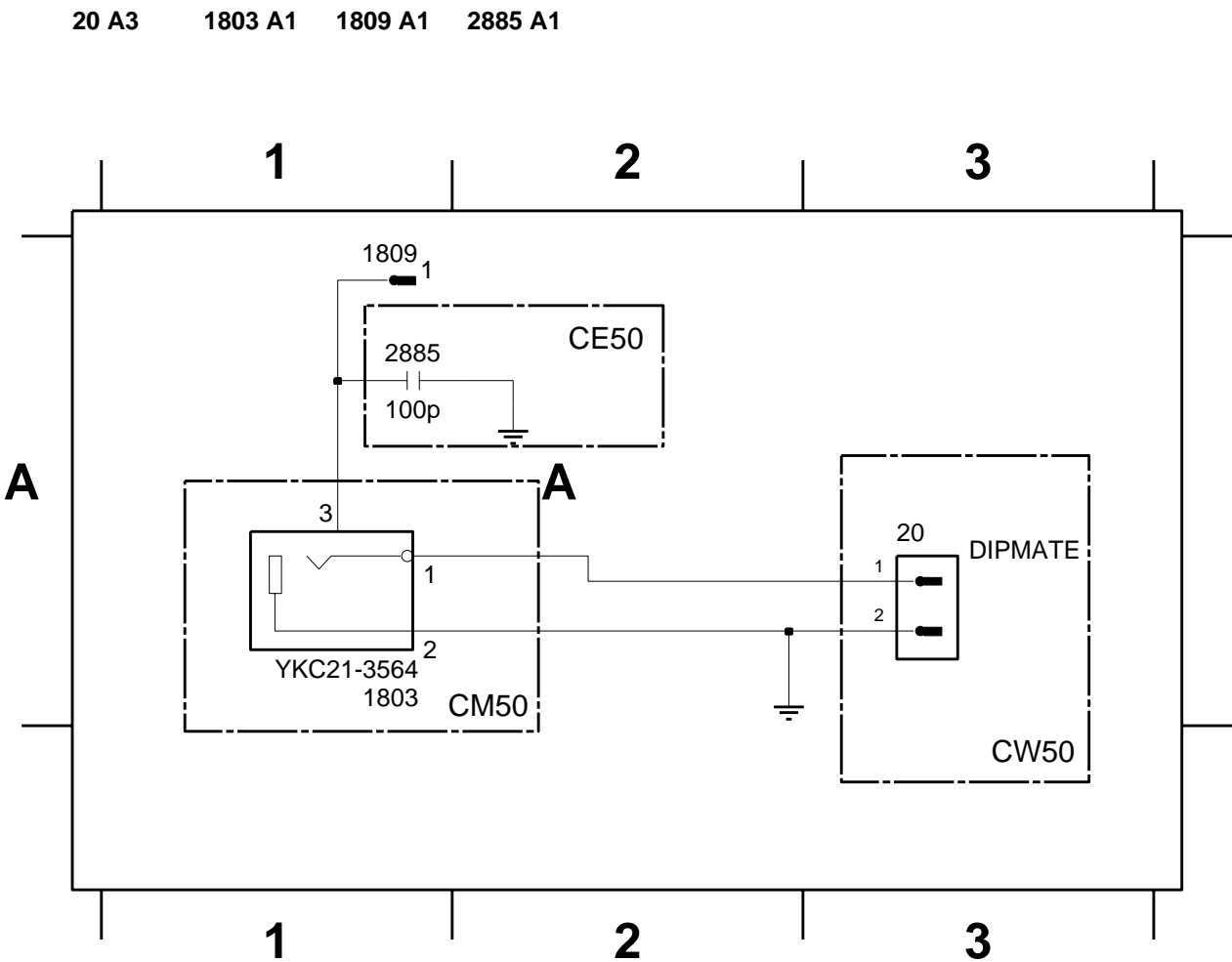
Updated on 15 SEPT 2003

1100 F6	T054 C1
1201 C1	T055 C1
1202 E1	T056 C1
1203 C1	T057 C1
1204 E1	T058 D1
1205 C1	T059 D1
1206 C1	T060 D1
1401 A9	T061 D1
1402 D9	T062 D1
1403 A9	T063 D1
1404 D9	T064 D1
1405 A9	T065 E1
1520 E6	T066 E1
1521 A7	T067 E1
1522 A6	T068 F1
1523 D6	T069 F1
1524 A5	T070 F1
1525 B5	T071 F1
1541 D4	T072 F1
1542 D4	T073 F1
1801 B1	T074 E4
2207 D3	T075 E4
2208 F2	T076 E4
2209 E3	T077 E4
2210 F2	T078 E4
2211 F3	T079 F4
2520 E7	T080 F4
2801 B4	T081 F4
2802 C3	T082 F4
2803 B3	T083 F4
2804 B3	T085 A6
2805 B2	T086 A7
2806 B2	T087 A7
2807 B1	T088 A7
2808 B4	T089 A6
2809 B4	T090 A6
2810 A4	T091 B6
2901 F6	T092 B6
2950 E7	T093 B6
2951 E7	T094 B6
2952 E7	T095 B6
2953 E7	T096 B6
2954 E6	T097 C6
2955 E1	T098 C6
3205 D2	T099 C6
3412 A8	T100 C6
3801 B4	T101 C6
3802 A4	T102 D6
3803 B3	T103 D6
3804 A3	T104 D6
3805 B2	T105 D6
3806 A1	T106 D6
3807 B4	T107 E6
3808 A3	T108 E6
3809 B2	T109 E6
3820 E3	T110 E6
3821 E2	T111 E6
3822 F3	T112 A8
4801 B4	T113 A8
4802 C4	T114 A8
4903 B8	T115 A8
4904 F7	T116 E3
4905 D3	T117 E8
4906 A5	T118 E8
4907 C8	T119 E8
4908 C8	T120 F8
4909 A3	T121 E1
4910 A3	T122 F6
4911 A4	T123 F6
4912 B8	T124 E1
4913 B8	T125 B8
4914 B5	
4915 C8	
4921 C1	
5801 B2	
5802 A3	
6204 F7	
6205 D3	
6206 F2	
6207 C5	
6208 C5	
6209 F3	
7202 E3	
7404 F3	
7802 A3	
9405 C8	
9483 F6	
9484 D4	
9486 E7	
9614 E3	
9634 E2	
9904 F7	
T050 B1	
T051 B1	
T052 A3	
T053 C4	

VIDEO OUT PART - COMPONENT & CHIP LAYOUTS (N/A for FWM37)



CIRCUIT DIAGRAM - VIDEO OUT PART (N/A for FWM37)



ELECTRICAL PARTSLIST - AF-9 BOARD

- MISCELLANEOUS -			- CAPACITORS -		
1100	4822 267 10676	CONNECTOR	2535	4822 124 40769	4,7µF 20% 100V
1102	4822 267 10676	CONNECTOR	2536	4822 124 40769	4,7µF 20% 100V
1103	4822 267 10676	CONNECTOR	2541	4822 124 41407	0,47µF 20% 63V
1204	2422 025 17467	CONNECTOR V 8P	2542	4822 124 41407	0,47µF 20% 63V
1206	4822 267 11039	CONNECTOR	2543	5322 126 11583	10nF 10% X7R 50V
			2544	5322 126 11583	10nF 10% X7R 50V
1401	4822 265 11553	CONNECTOR 19P	2546	4822 121 43856	4,7nF 5% 250V
1402	4822 267 11039	CONNECTOR 11P	2547	5322 126 11579	3,3nF 10% X7R 63V
1501	4822 265 20553	CONNECTOR	2548	5322 126 11579	3,3nF 10%X7R 63V
1506	2412 020 00724	CONNECTOR V 2P	2565	4822 121 43856	4,7nF 5% 250V
1520	4822 265 11515	CONNECTOR V 8P			
			2567	3198 016 31020	1nF NP0 25V
1523	4822 265 10981	CONNECTOR	2568	3198 016 31020	1nF NP0 25V
1531	4822 267 10953	CONNECTOR	2589	4822 121 42408	220nF 5% 63V
1603	4822 267 10733	CONNECTOR	2590	4822 121 42408	220nF 5% 63V
			2591	5322 121 42661	330nF 5% 63V
2201	4822 124 40207	100µF 20% 25V	2592	5322 121 42661	330nF 5% 63V
2202	4822 124 81151	22µF 50V	2593	4822 121 51252	470nF 5% 63V
2203	4822 124 40433	47µF 20% 25V	2594	4822 121 51252	470nF 5% 63V
2204	4822 124 40196	220µF 20% 16V	2601	3198 016 31020	1nF NP0 25V
2205	4822 126 14238	2,2nF X7R 50V	2602	3198 016 31020	1nF NP0 25V
2206	2238 916 15641	22nF 10%X7R 25V	2603	4822 124 81151	22µF 50V
2207	4822 124 40433	47µF 20% 25V	2604	4822 124 81151	22µF 50V
2208	4822 126 13879	220nF +80-20% 16V	2605	2020 552 94427	100pF 5% NP0 50V
2209	4822 124 41751	47µF 20% 50V	2606	2020 552 94427	100pF 5% NP0 50V
2210	4822 126 13879	220nF +80-20% 16V	2607	4822 126 13881	470pF 5% 50V
2401	2020 552 94427	100pF 5% NP0 50V	2608	4822 126 13881	470pF 5% 50V
2402	2020 552 94427	100pF 5% NP0 50V	2609	4822 126 14508	180pF 5% 50V NP0
2403	2238 586 59812	100nF +80-20% Y5V 50V	2610	4822 126 14508	180pF 5% 50V NP0
2404	2238 586 59812	100nF +80-20% Y5V 50V	2611	4822 124 81151	22µF 50V
2501	2020 552 94427	100pF 5% NP0 50V	2612	4822 124 81151	22µF 50V
2502	2020 552 94427	100pF 5% NP0 50V	2621	4822 124 81151	22µF 50V
2503	2022 020 00734	1µF 20% 50V	2622	4822 126 13881	100pF 5% NP0 50V
2504	2022 020 00734	1µF 20% 50V	2623	4822 124 40433	47µF 20% 25V
2505	2020 552 94427	100pF 5% NP0 50V	2624	3198 017 42230	22nF Y5V 50V
2506	2020 552 94427	100pF 5% NP0 50V	2625	4822 124 40207	100µF 20% 25V
2507	2238 586 59812	100nF +80-20% Y5V 50V	2626	4822 124 40769	4,7µF 20% 100V
2511	2022 020 00734	1µF 20% 50V	2641	3198 016 31020	1nF NP0 25V
2512	2022 020 00734	1µF 20% 50V	2642	3198 016 31020	1nF NP0 25V
2513	3198 016 31020	1nF NP0 25V	2653	2020 552 94427	100pF 5% NP0 50V
2514	3198 016 31020	1nF NP0 25V	2654	2020 552 94427	100pF 5% NP0 50V
2515	2020 552 94427	100pF 5% NP0 50V	2669	2238 586 59812	100nF +80-20% Y5V 50V
2516	2020 552 94427	100pF 5% NP0 50V	2681	4822 124 40433	47µF 20% 25V
2521	2238 586 59812	100nF +80-20% Y5V 50V	2682	4822 122 33752	15pF 5% NP0 50V
2522	2238 586 59812	100nF +80-20% Y5V 50V	2683	2238 586 59812	100nF +80-20% Y5V 50V
2523	2020 552 94427	100pF 5% NP0 50V	2691	2020 552 94427	100pF 5% NP0 50V
2524	2020 552 94427	100pF 5% NP0 50V	2707	2020 552 94427	100pF 5% NP0 50V
2531	4822 124 40769	4,7µF 20% 100V	2708	2020 552 94427	100pF 5% NP0 50V
2532	4822 124 40769	4,7µF 20% 100V	2771	4822 124 41407	0,47µF 20% 63V
2533	2020 552 94427	100pF 5% NP0 50V	2902	3198 017 44740	470nF Y5V 10V
2534	2020 552 94427	100pF 5% NP0 50V	2905	3198 017 42230	22nF Y5V 50V