

Service
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Service Manual



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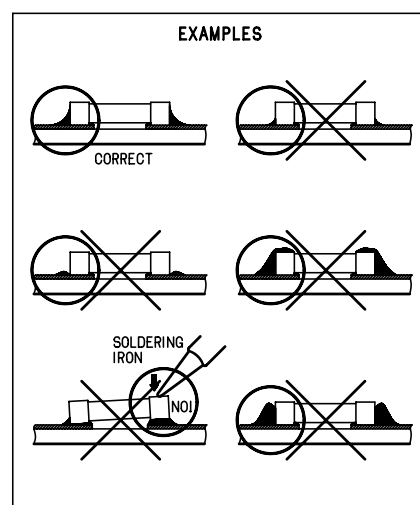
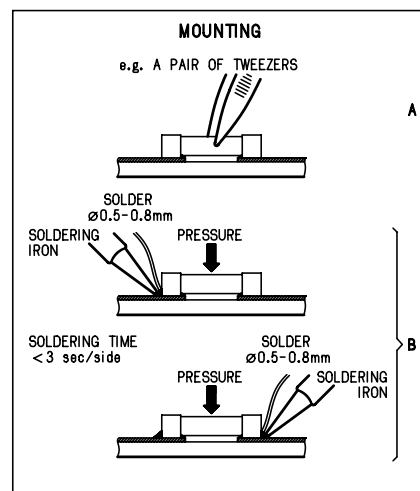
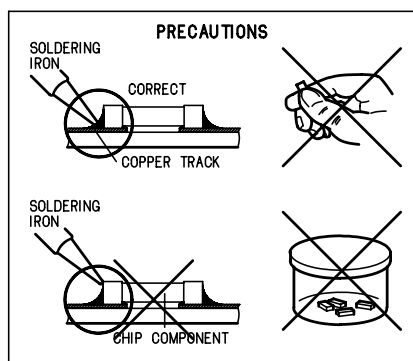
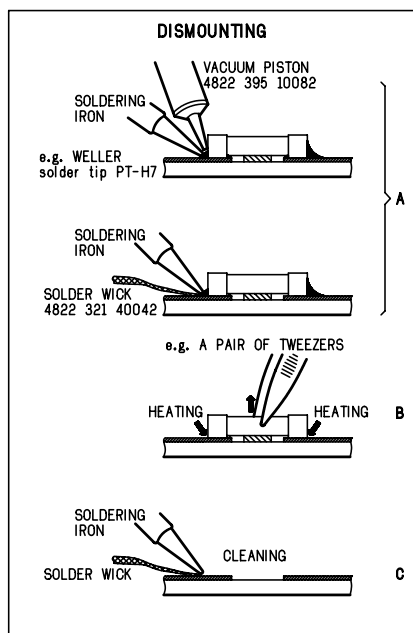
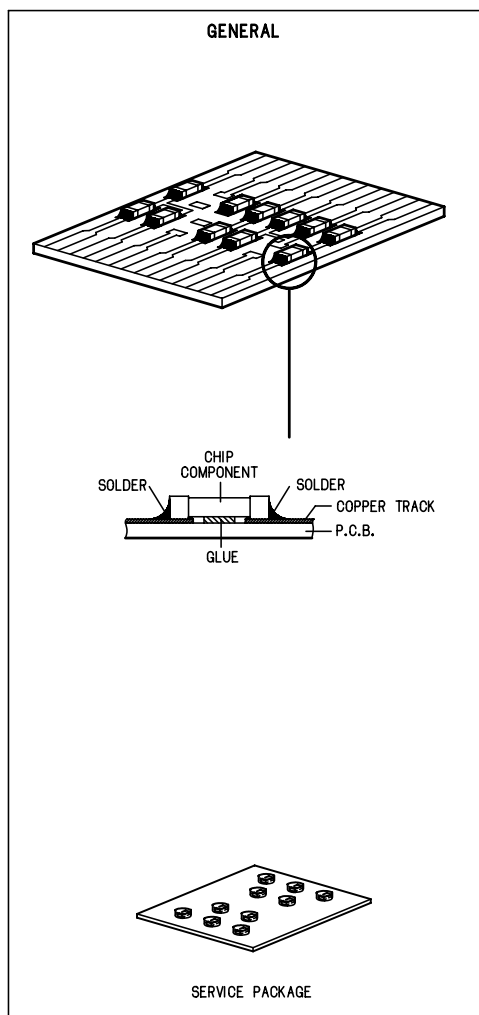
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HANDLING CHIP COMPONENTS



SERVICE TOOLS

- TORX T10 screwdriver with shaftlength 150mm.....4822 395 50423
- TORX screwdriver set SBC 163.....4822 295 50145
- Audio signal disc SBC 429.....4822 397 30184
- Playability test disc SBC 444.....4822 397 30245
- Test disc 5 (disc without errors) +
- Test disc 5A (disc with dropout errors, black spots and fingerprints)
SBC 426/426A.....4822 397 30096
- Burn in test disc (65 min. 1kHz signal at -30 dB level without "pause").....4822 397 30155
- Universal test cassette Fe SBC 420.....4822 397 30071

AVAILABLE ESD PROTECTION EQUIPMENT

- anti-static table mat large 1200x650x1.25mm 4822 466 10953
- small 600x650x1.25mm 4822 466 10958
- anti-static wristband 4822 395 10223
- connection box (3 press stud connections, 1MΩ) 4822 320 11307
- extendible cable (2m, 2MΩ, to connect wristband to connection box) 4822 320 11305
- connecting cable (3m, 2MΩ, to connect table mat to connection box) 4822 320 11306
- earth cable (1MΩ, to connect any product to mat or to connection box) 4822 320 11308
- KIT ESD3 (combining all 6 prior products - small table mat) 4822 310 10671
- wristband tester 4822 344 13999

INFORMATION ABOUT LEAD-FREE SOLDERING

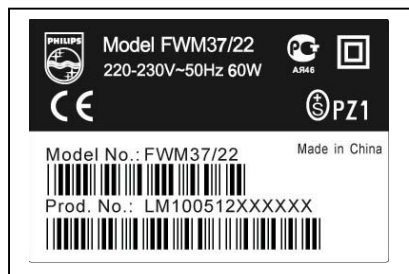
Philips CE is producing lead-free sets from 1.1.2005 onwards.

IDENTIFICATION:

Regardless of special logo (not always indicated) one must treat all sets from 1 Jan 2005 onwards, according next rules:



Example S/N:



Bottom line of typeplate gives a 14-digit S/N. Digit 5&6 is the year, digit 7&8 is the week number, so in this case 2005 wk12

So from 0501 onwards = from 1 Jan 2005 onwards

Important note: In fact also products of year 2004 must be treated in this way as long as you avoid mixing solder-alloys (lead/ lead-free). So best to always use SAC305 and the higher temperatures belong to this.

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
 - To reach at least a solder-temperature of 400°C,
 - To stabilize the adjusted temperature at the solder-tip
 - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free).
If one cannot avoid or does not know whether product is lead-free, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- **Special information for BGA-ICs:**
 - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use the lead-free temperature profile, in case of doubt)
 - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website. Do not re-use BGAs at all.
- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.
- On our website www.atyourservice.ce.Philips.com you find more information to:
 - BGA-de-/soldering (+ baking instructions)
 - Heating-profiles of BGAs and other ICs used in Philips-sets

You will find this and more technical information within the "magazine", chapter "workshop news".

For additional questions please contact your local repair-helpdesk.

SERVICE INSTRUCTION

Safety regulations require that after a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power isolated power supply):
 1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
 2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
 3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
 4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.
- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

TECHNICAL SPECIFICATIONS

GENERAL

Mains voltage	-/22 : 230 V
	-/21/21M : 120 / 230 V
	-/37 : 120 V
Mains frequency	-/22 : 50 Hz
	-/21/21M : 50 / 60 Hz
	-/37 : 60 Hz
Battery	remote : 3V (R6 x 2)
Power consumption	normal : < 15 W (max.)
	Standby : 3W
	Eco-standby : 1W
Dimension (W x H x D)	: 400 x 220 x 250 mm
Weight	: 6.3 Kg

AMPLIFIER

Output power	: 2 x 15 W RMS
Headphone output	: 2 x 15 mW
Speaker impedance	: 2 x 4 ohm
Frequency response	: 45 Hz - 15 kHz (± 3 dB)
Aux input sensitivity	: 500mV

TUNER - FM SECTION

Tuning range	: 87.5 - 108 MHz
IF frequency	: 10.7 MHz ± 0.2 MHz
Sensitivity	: 45 dB at 46dB S/N
Selectivity	: 40 dB at 300kHz
IF rejection	: 65 dB
Image rejection	: 25 dB

TUNER - AM SECTION

Tuning range	AM(MW) : 531 - 1602 kHz
	-/37 : 530 - 1700 kHz
IF frequency	: 450 kHz ± 1 kHz
Sensitivity	MW : 4000 μ V/m at 26dB S/N
Selectivity	MW : 25 dB
IF rejection	MW : 28 dB
Image rejection	MW : 25 dB

AUDIO CASSETTE RECORDER

Number of tracks	: 1 stereo
Tape speed	: 4.76 cm/sec $\pm 3\%$
Wow & flutter	: < 0.48% JIS(unwtd)
Fast wind/rewind C60	: < 130 sec.
Frequency response	P/B : 125 - 10,000 Hz
S/N ratio	: 36 dB (R/P)
Erasing ratio	: > 50 dB
Bias frequency	: 75 ± 10 kHz

COMPACT DISC

Frequency response	: 20 Hz - 10 kHz ± 2 dB
S/N ratio	: 80 dB
Channel difference	1 kHz : 2 dB
Channel crosstalk	1 kHz : 40 dB
Laser wavelength	: 780 ± 20 nm
Laser light power	: < 0.5 mW

SERVICE TOOLS

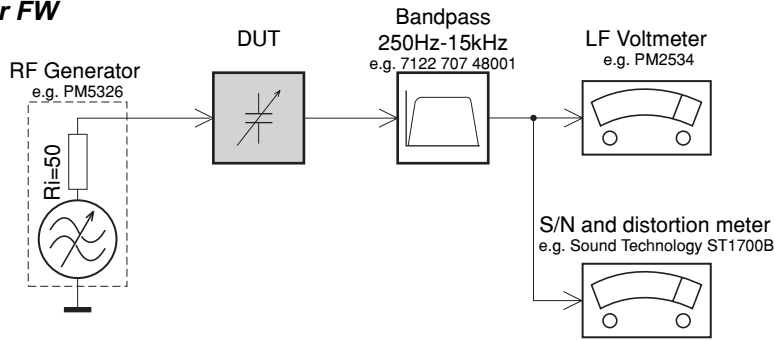
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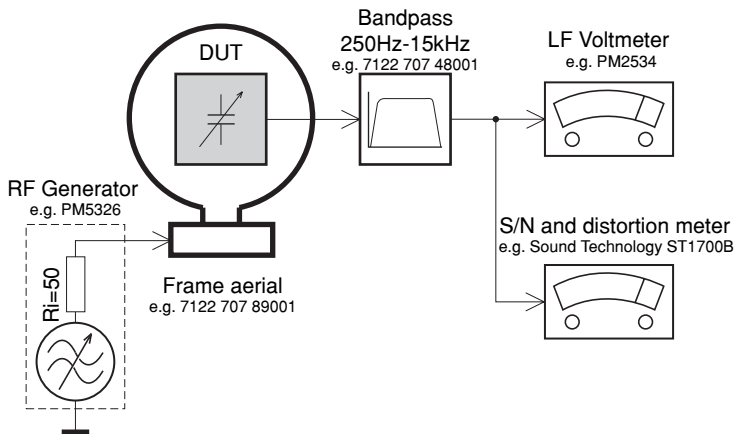
SERVICE MEASUREMENT

Tuner FW



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

Tuner AM (MW, LW)



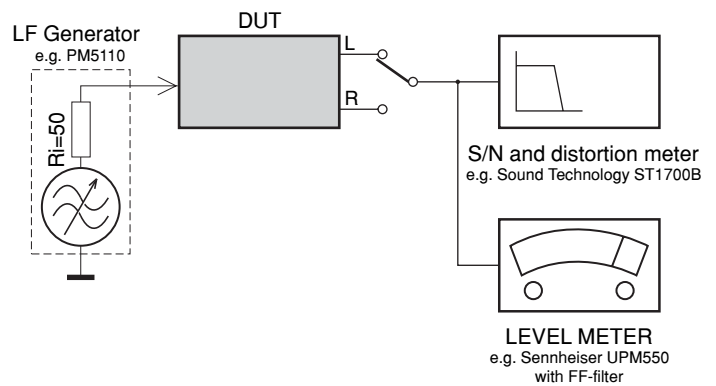
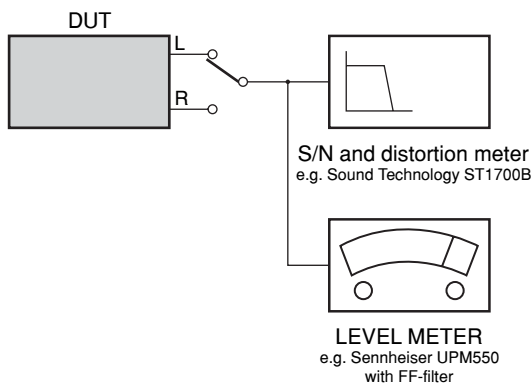
To avoid atmospheric interference all AM-measurements have to be carried out in a Faraday cage. Use a bandpass filter (or at least a high pass filter with 250kHz) to eliminate hum (50Hz, 100Hz).

CD

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

RECORDER

Use Universal Test Cassette Fe SBC420 4822 397 30071



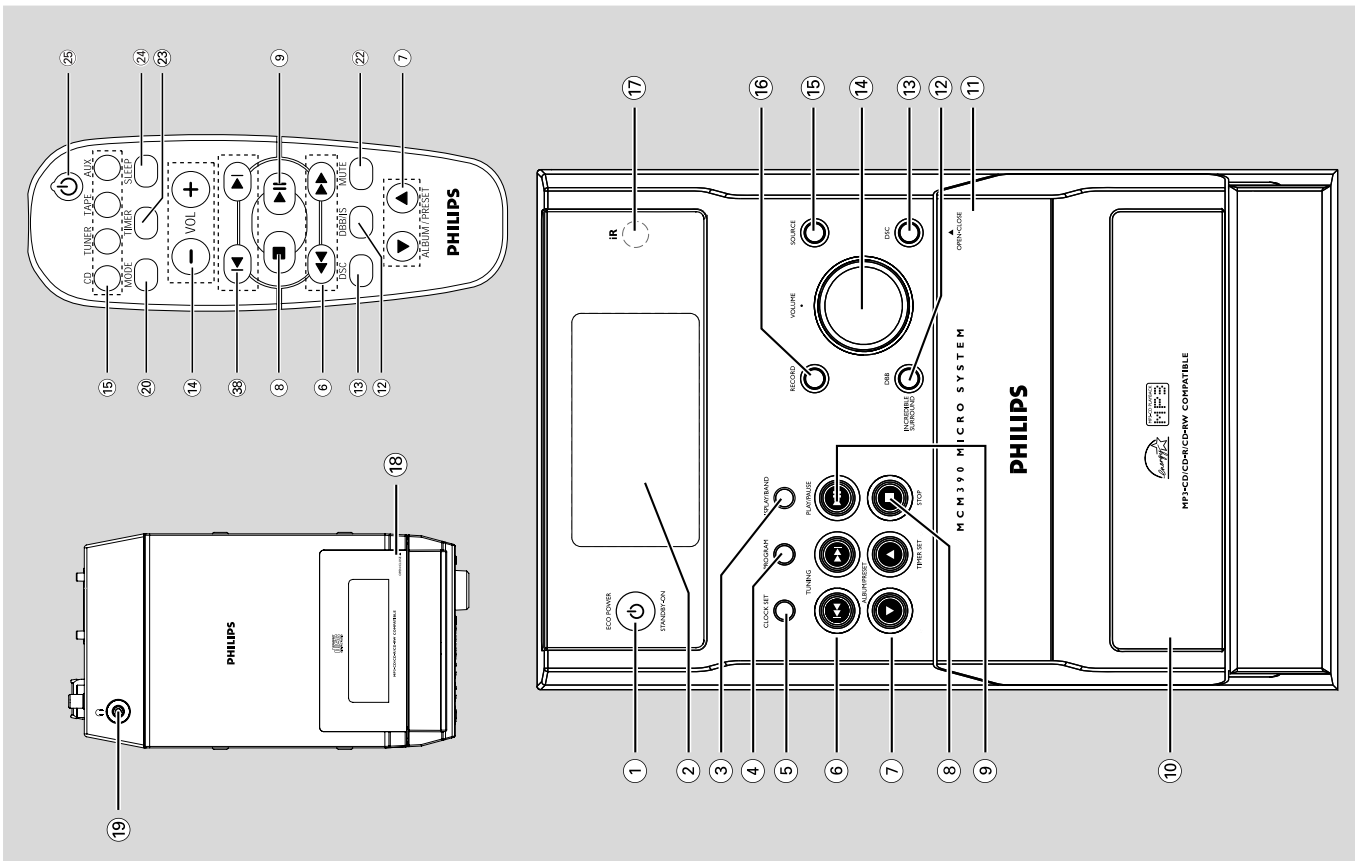
CONNECTION AND CONTROLS

Controls

Controls on the system and remote control

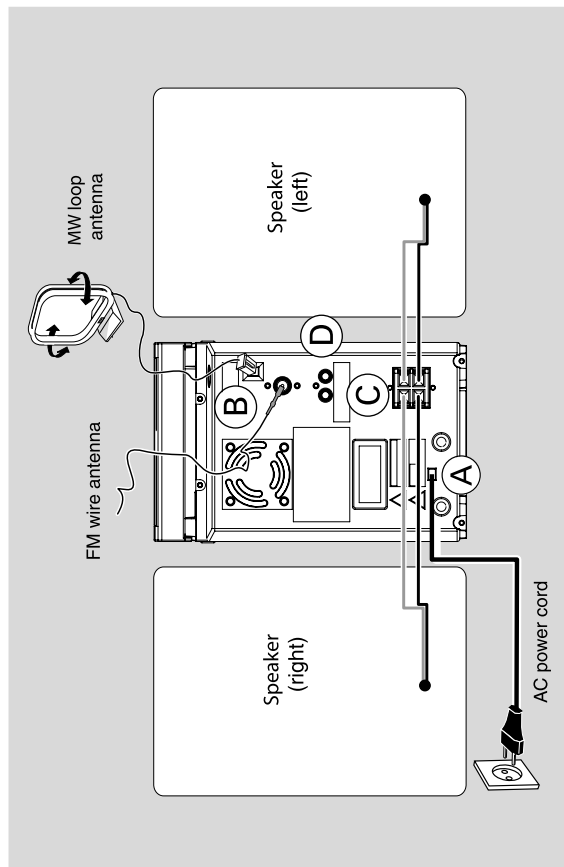
- ① **Eco Power/STANDBY ON** to switch the system on or to Eco Power standby mode.
- ② **Display screen** to view the current status of the system.
- ③ **DISPLAY/BAND** for Tunerto select waveband : FM, MW or LW.
for CD/MP3-CD...to select disc information display mode.
- ④ **PROGRAM** for CD/MP3-CD...to programme disc tracks.
for Tunerto programme preset radio stations.
- ⑤ **CLOCK SET** for Clock*(on the system only)* to set the clock function.
- ⑥ **◀◀▶▶ TUNING (◀◀ ▶▶)** for CDto fast reverse/forward the disc.
for CD/MP3 CD...*(on the system only)* to select a desired track.
for Tunerto tune to a lower or higher radio frequency
for Tapeto rewind or fast forward.
- ⑦ **▼▲ ALBUM/PRESET/TIMER SET** for MP3-CDto select previous/next album.
for Tunerto select a preset radio station.
for Timer Set (▲) *(on the system only)* to set the timer function.
- ⑧ **■ STOP** for CD/MP3-CD...to stop playback or to clear a programme.
for Tapeto stop playback or recording.
- ⑨ **PLAY/PAUSE ▶||** for CD/MP3 CD...to start or interrupt playback.
for Tapeto start playback.
- ⑩ **Tape deck**
- ⑪ **OPEN ▲** to open tape compartment.
- ⑫ **IS/DBB (Incredible Surround/Dynamic Bass Boost)**
to create a super-enhanced stereo effect.
to enhance the bass.
- ⑬ **DSC (Digital Sound Control)** to select the desired sound effect : OPTIMAL/ROCK/POP/JAZZ.
- ⑭ **VOLUME (VOL + / -)** to increase or decrease the volume.
(on the system only) to adjust the hours and minutes for the clock/timer functions.
- ⑮ **SOURCE** to select the respective sound source : CD, TUNER, TAPE or AUX.
- ⑯ **RECORD** to start recording.
- ⑰ **iR sensor** infrared sensor for remote control.
- ⑱ **OPEN-CLOSE ▲** to open or close the disc tray.
- ⑲ **Headphone** Plugs in the headphones jack. The speakers output will be cancelled.
- ⑳ **MODE** to shuffle and repeat a track/disc.
- ㉑ **◀ / ▶** to select a desired track.
- ㉒ **MUTE** interrupts and resumes sound reproduction.
- ㉓ **TIMER** to activate/deactivate the timer function.
- ㉔ **SLEEP** to activate/deactivate or set the sleep timer.
- ㉕ to switch the system to standby mode.

Notes for remote control:
 - First select the source you wish to control by pressing one of the source select keys on the remote control (for example CD, TUNER).
 - Then select the desired function (for example ▶, ▲, ▶).



CONNECTION AND CONTROLS

Preparations



Rear connections

The type plate is located at the rear of the system.

A Power

- Before connecting the AC power cord to the wall outlet, ensure that all other connections have been made.
- If your system is equipped with a Voltage Selector, set the VOLTAGE SELECTOR to the local power-line voltage.

WARNING!

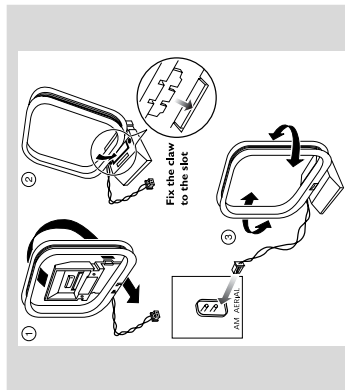
- For optimal performance, use only the original power cable.
- Never make or change connections with the power switched on.

To avoid overheating of the system, a safety circuit has been built in. Therefore, your system may switch to Standby mode automatically under extreme conditions. If this happens, let the system cool down before reusing it (not available for all versions).

B Antennas Connection

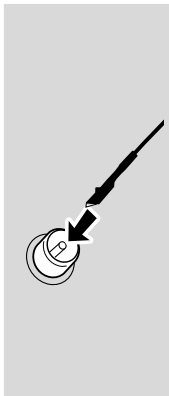
Connect the supplied MW loop antenna and FM antenna to the respective terminals. Adjust the position of the antenna for optimal reception.

MW Antenna



Position the antenna as far as possible from a TV, VCR or other radiation source.

FM Antenna

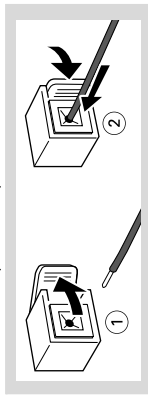


For better FM stereo reception, connect an outdoor FM antenna to the FM AERIAL (FM ANTENNA) terminal.

C Speakers Connection

Front Speakers

Connect the speaker wires to the SPEAKERS terminals, right speaker to "RIGHT" and left speaker to "LEFT", coloured (marked) wire to "+" and black (unmarked) wire to "-".



Fully insert the stripped portion of the speaker wire into the terminal as shown.

Notes:

- For optimal sound performance, use the supplied speakers.
- Do not connect more than one speaker to any one pair of + / - speaker terminals.
- Do not connect speakers with an impedance lower than the speakers supplied. Please refer to the SPECIFICATIONS section of this manual.

Preparations

D Optional connection

The optional equipment and connecting cords are not supplied. Refer to the operating instructions of the connected equipment for details.

Connecting other equipment to your system

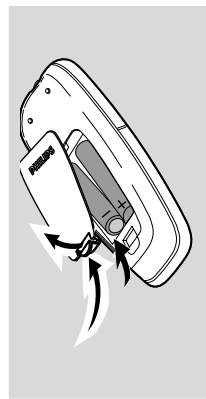
Connect the audio left and right OUT terminals of a TV, VCR, Laser Disc player, DVD player or CD Recorder to the **AUX IN** terminals.

Note:

- If you are connecting equipment with a monoaural output (a single audio out terminal), connect it to the **AUX IN** left terminal. Alternatively, you can use a "single to double" cinch cable (the output sound still remain monoaural).

Inserting batteries into the remote control

Insert two batteries (type R03 or AAA) into the remote control with the correct polarity as indicated by the "+" and "-" symbols inside the battery compartment.



CAUTION!

- Remove batteries if they are exhausted

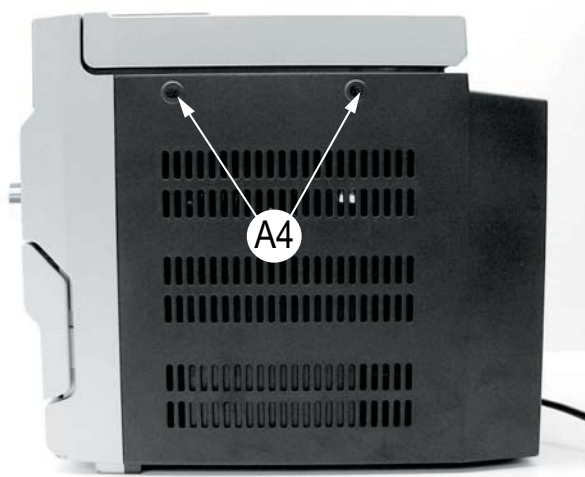
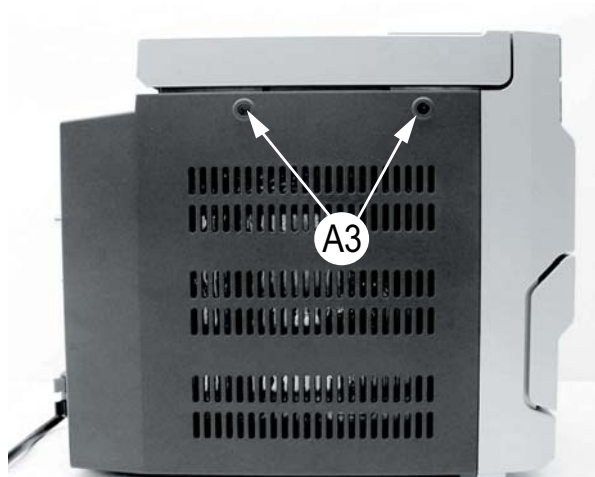
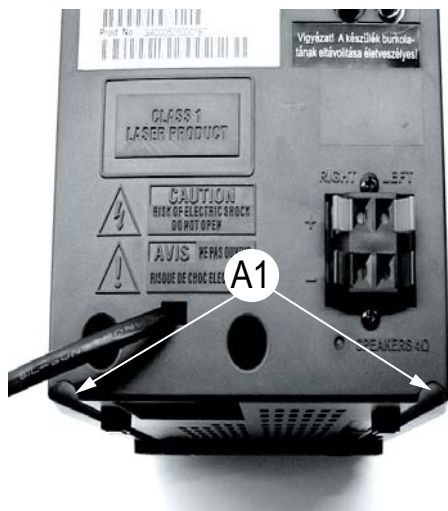
For more information on operation instruction please visit Philips Audio internet site :

<http://www.audio.philips.com>

DISASSEMBLY DIADRAMS

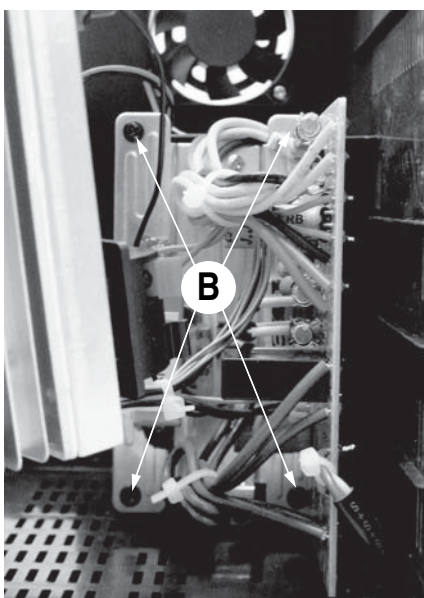
STEP A : Remove Back Cabinet

- A1 : Remove 2 screws (SP3x10)
- A2 : Remove 7 screws (SP3x10)
- A3 : Remove 2 screws (K3x10)
- A4 : Remove 2 screws (K3x10)



STEP B : Remove Power Transformer and Mains board

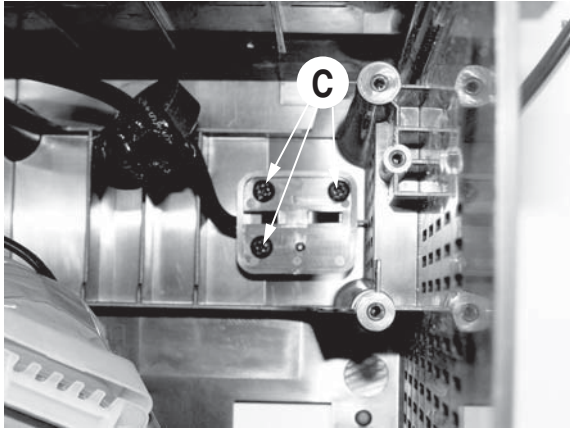
- Remove 4 screws (SP3x12)



DISASSEMBLY DIADRAMS

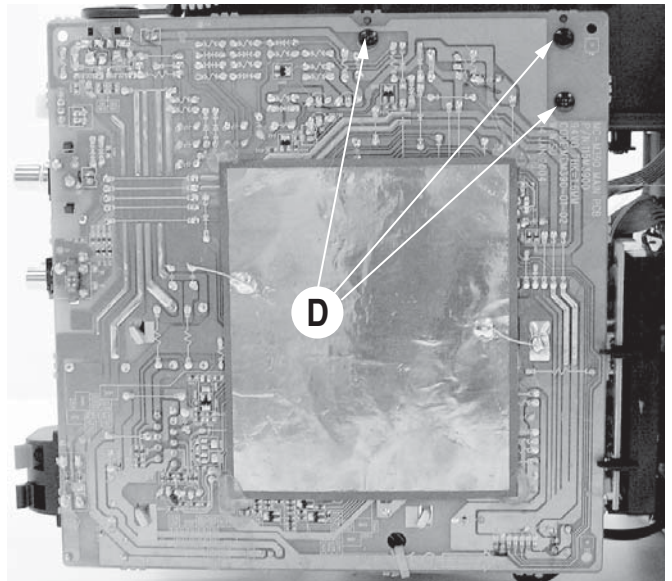
STEP C : Remove AC Cord Cover

- Remove 3 screws (SP3x10)



STEP D : Remove Main PCB from CD Tray

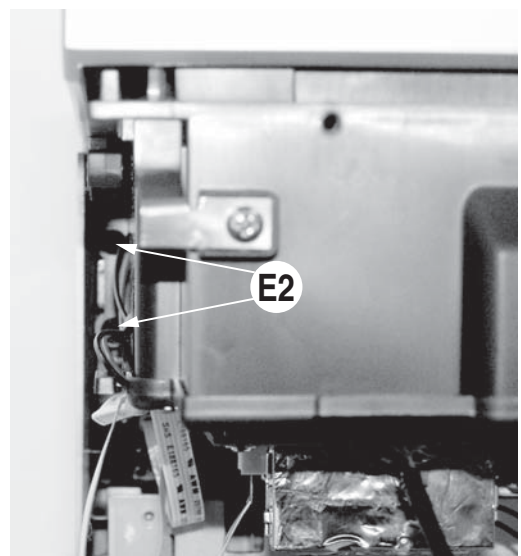
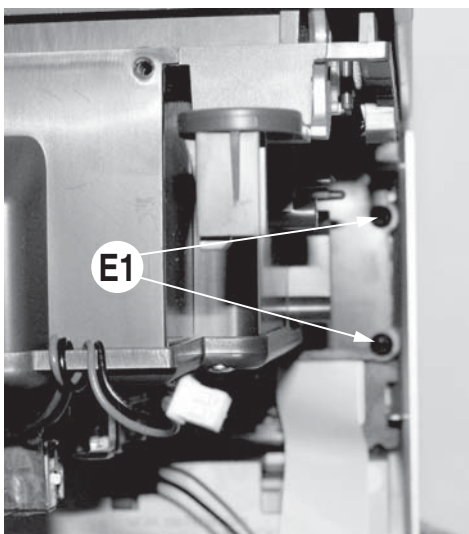
- Remove 3 screws (SP3x10)



STEP E :

Remove CD Tray from Front Cabinet

- E1 : Remove 2 screws (SP3x10)
- E2 : Remove 2 screws (SP3x10)

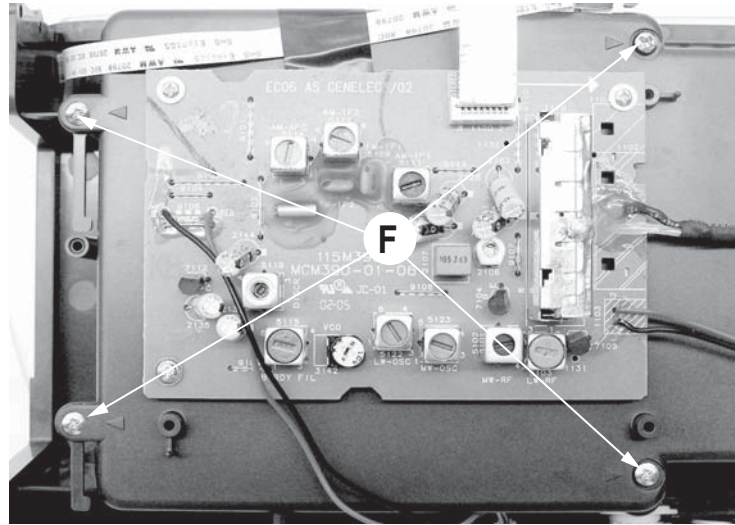


DISASSEMBLY DIADRAMS

STEP F :

Remove CD Tray Cover

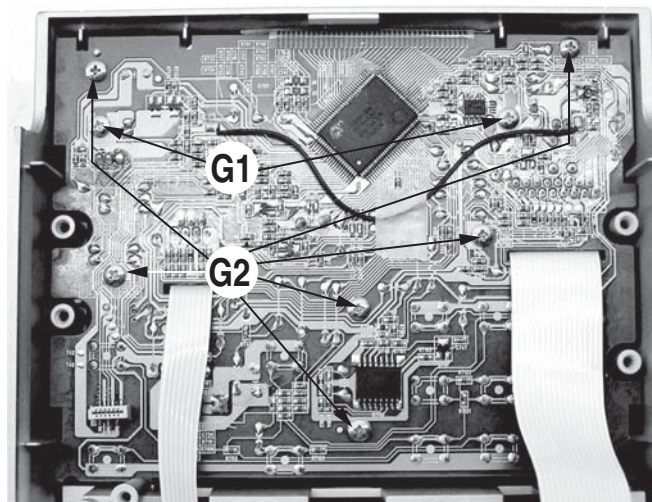
- Remove 4 screws (SP3x10)



STEP G :

Remove LCD PCB from Front Cabinet

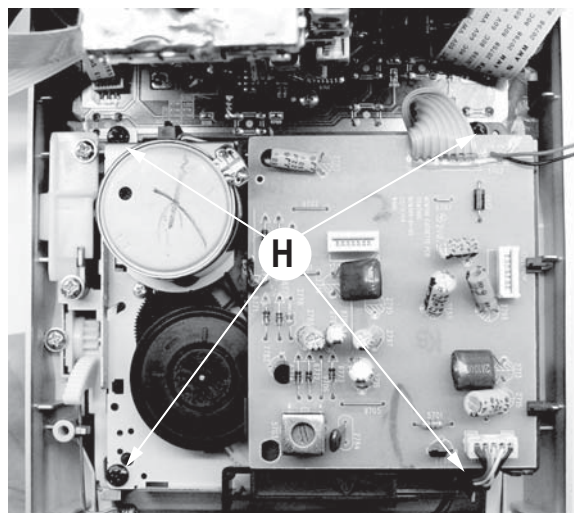
- G1 : Remove 2 screws (SP2.6x8)
- G2 : Remove 6 screws (SP2.6x10)



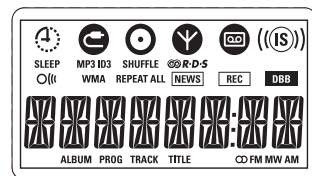
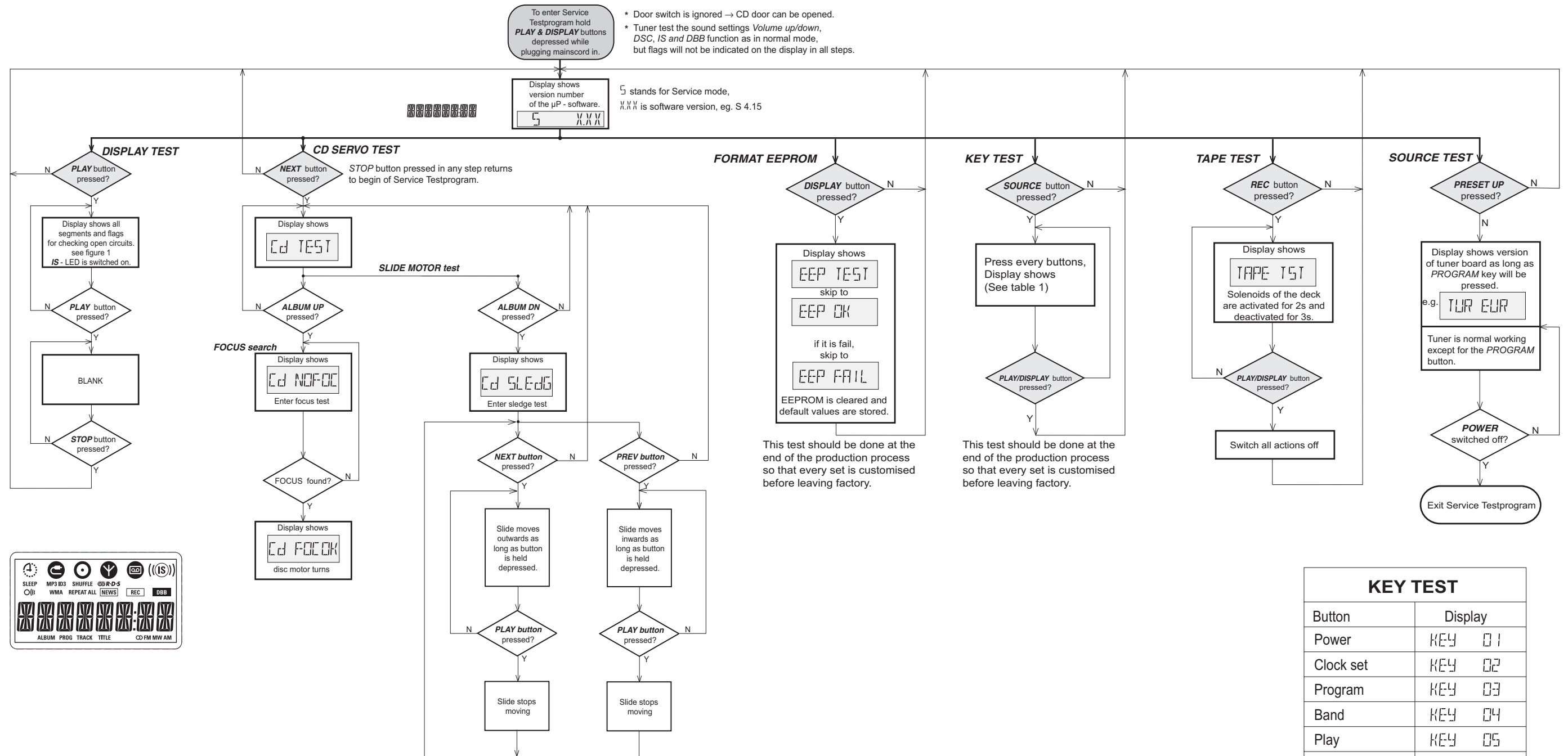
STEP H :

Remove Tape Deck (M -> H)

- H : Remove 4 screws (SP3x10)



SERVICE TEST PROGRAM



TUNER VERSIONS

	TUN EUR	TUN USA	TUN OSE
REGION & SET VERSIONS	EUROPE FM/MW /22/25	USA FM/MW /37	OVERSEAS FM/MW 1) Grid switchable 100/10kHz - 50/9kHz /21/21M/30

table 2

1) To toggle frequency grid press **BAND** button for more than 5s in normal tuner mode (**not** in service testmode).

Display will show either **GR109KHZ** or **GR110KHZ**, and show **T0 10KHZ** or **T0 9KHZ**

when button released.

KEY TEST

Button	Display
Power	KEY 01
Clock set	KEY 02
Program	KEY 03
Band	KEY 04
Play	KEY 05
▶▶	KEY 06
◀◀	KEY 07
▼	KEY 08
▲	KEY 09
■	KEY 10
RECORD	KEY 11
SOURCE	KEY 12
IS	KEY 13
DSS	KEY 14
VOL DOWN	KEY 15
VOL DOWN	KEY 16

Table1

Abbreviations and Pin-description of CD Ics

SERVO PROCESSOR SAA7325H

SYMBOL	PIN	DESCRIPTION
HFREF	1	comparator common mode input
HFIN	2	comparator signal input
ISLICE	3	current feedback output from data slicer
V _{SSA1}	4 ⁽¹⁾	analog ground 1
V _{DDA1}	5 ⁽¹⁾	analog supply voltage 1
I _{ref}	6	reference current output pin
V _{RIN}	7	reference voltage for servo ADC's
D1	8	unipolar current input (central diode signal input)
D2	9	unipolar current input (central diode signal input)
D3	10	unipolar current input (central diode signal input)
D4	11	unipolar current input (central diode signal input)
R1	12	unipolar current input (satellite diode signal input)
R2	13	unipolar current input (satellite diode signal input)
V _{SSA2}	14 ⁽¹⁾	analog ground 2
CROUT	15	crystal/resonator output
CRIN	16	crystal/resonator input
V _{DDA2}	17 ⁽¹⁾	analog supply voltage 2
LN	18	DAC left channel differential output - negative
LP	19	DAC left channel differential output - positive
V _{neg}	20	DAC negative reference input
V _{pos}	21	DAC positive reference input
RN	22	DAC right channel differential output - negative
RP	23	DAC right channel differential output - positive
SELPLL	24	selects whether internal clock multiplier PLL is used
TEST1	25	test control input 1; this pin should be tied LOW
CL16	26	16.9344 MHz system clock output
DATA	27	serial d4(1)ata output (3-state)
WCLK	28	word clock output (3-state)
SCLK	29	serial bit clock output (3-state)
EF	30	C2 error flag output (3-state)
TEST2	31	test control input 2; this pin should be tied LOW
KILL	32	kill output (programmable; open-drain)
V _{SSD1}	33 ⁽¹⁾	digital ground 2
V2/V3	34	versatile I/O: input versatile pin 2 or output versatile pin 3 (open-drain)
WCLI	35	word clock iutput (for data loopback to DAC)
SDI	36	serial data input (for data loopback to DAC)
SCLI	37	serial bit clock input (for data loopback to DAC)
RESET	38	power-on reset input (active LOW)
SDA	39	microcontroller interface data I/O line (open-drain output)
SCL	40	microcontroller interface clock line input

Abbreviations and Pin-description of CD Ics

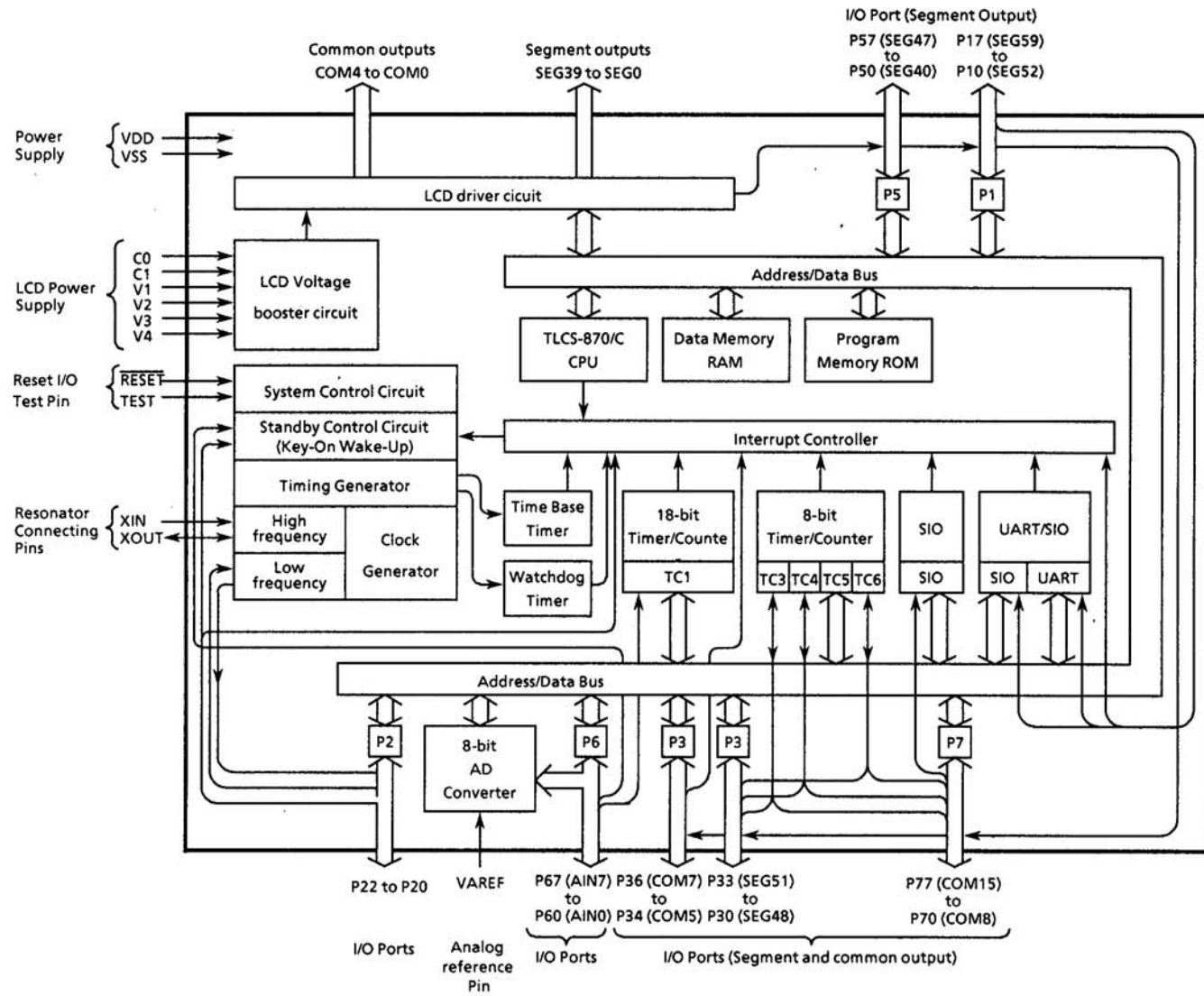
SERVO PROCESSOR SAA7325H

SYMBOL	PIN	DESCRIPTION
RAB	41	microcontroller interface R/W and load control line input (4-wire bus mode)
SILD	42	microcontroller interface R/W and load control line input (4-wire bus mode)
STATUS	43	servo interrupt request line/decoder status register output (open-drain)
TEST3	44	test control input 3; this pin should be tied LOW
RCK	45	subcode clock input
SUB	46	P-to-W subcode bits output (3-state)
SFSY	47	subcode frame sync output (3-state)
SBSY	48	subcode block sync output (3-state)
CL11/4	49	11.2896 MHz or 4.2336 MHz (for microcontroller) clock output
V _{SSD2}	50 ⁽¹⁾	digital ground 3
DOBM	51	bi-phase mark output (externally buffered; 3-state)
V _{DD1(P)}	52 ⁽¹⁾	digital supply voltage 2 for periphery
CFLG	53	correction flag output (open-drain)
RA	54	radial actuator output
FO	55	focus actuator output
SL	56	sledge control output
V _{DD2(C)}	57 ⁽¹⁾	digital supply voltage 3 for core
V _{SSD3}	58 ⁽¹⁾	digital ground 4
MOTO1	59	motor output 1; versatile (3-state)
MOTO2	60	motor output 2; versatile (3-state)
V4	61	versatile output pin 4
V5	62	versatile output pin 5
V1	63	versatile intput pin 1
LDON	64	laser drive on output (open-drain)

Note : All supply pins must be connected to the same external power supply voltage.

BLOCK DIAGRAM OF INTEGRATED CIRCUIT

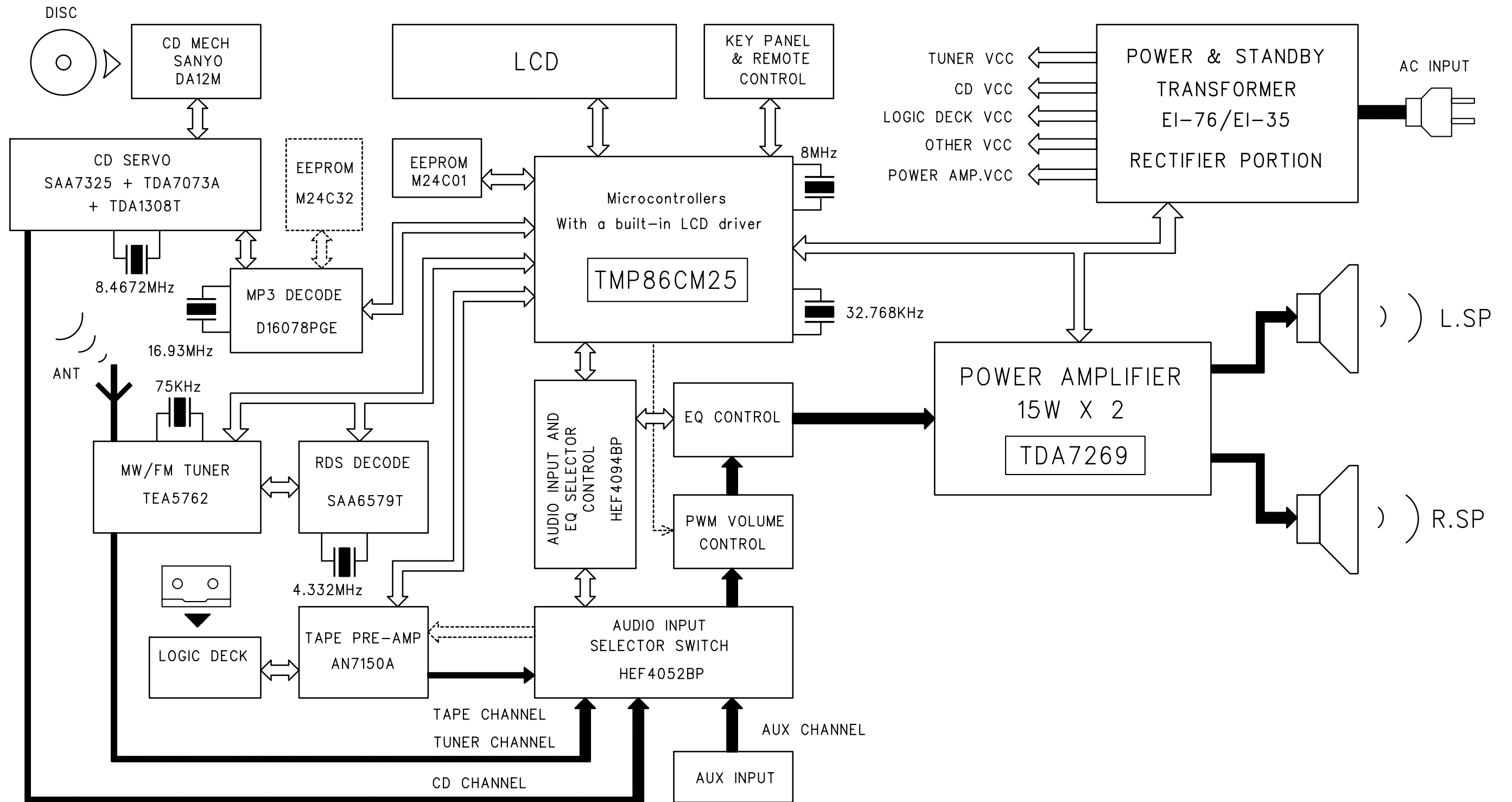
IC 7400 TMP86CS25F



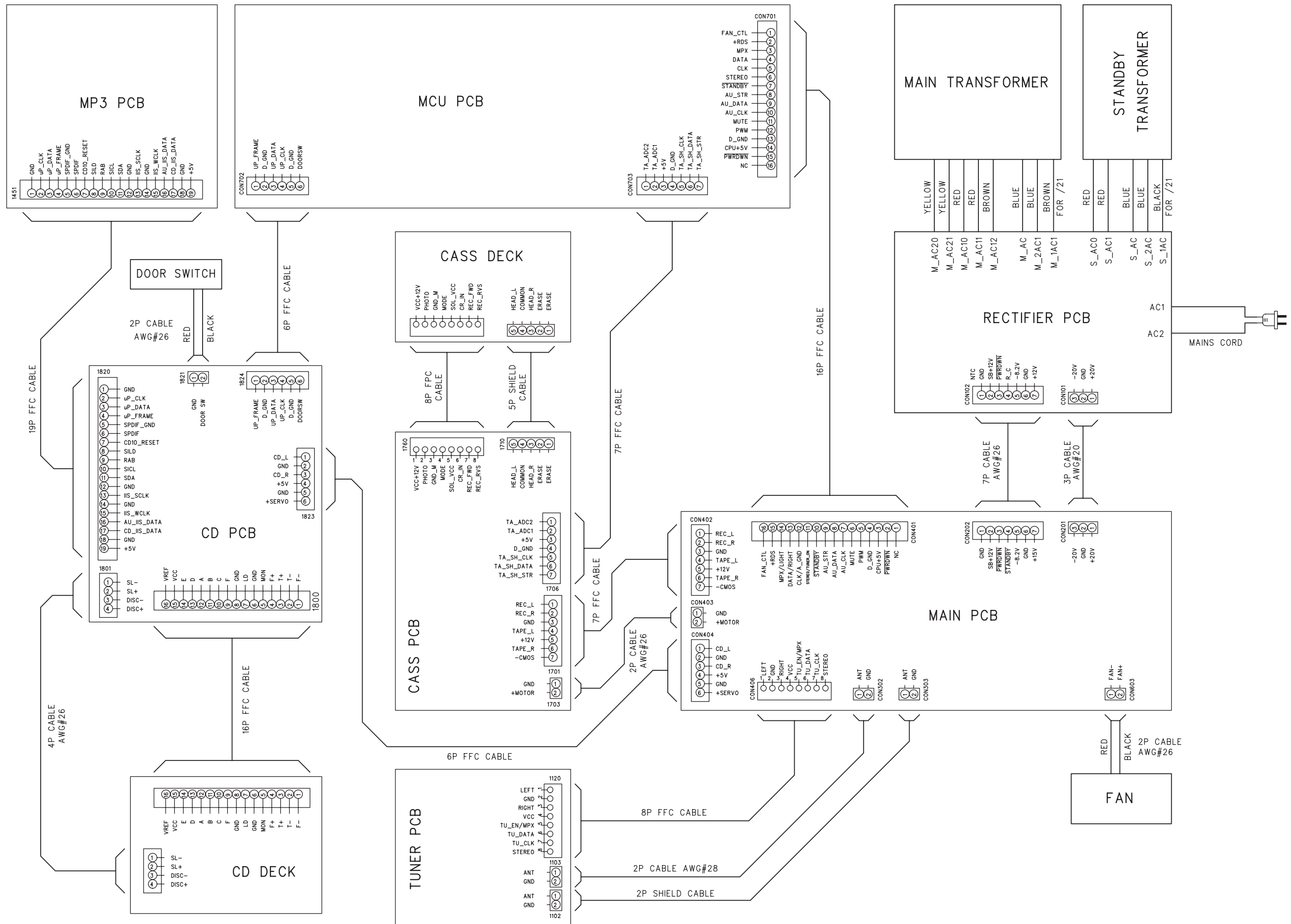
PINS DESCRIPTION OF IC 7400 TMP86CS25F

Pin Name	Input / Output	Function
PIN FUNCTION		
P16 (SEG25, TxD, SO)	I/O (Output)	8-bit input / output port with latch. UART data output Serial data output
P15 (SEG26, RxD, SI)	I/O (I/O)	When used as input port, an external interrupt input, serial clock input / output, serial data input / output and UART data input / output, the latch must be set to "1".
P14 (SEG27, MUL6)	I/O (I/O)	UART data input Serial data input
P13 (SEG28, MUL5)	I/O (I/O)	External interrupt 3 input
P12 (SEG29, MUL4)	I/O (I/O)	External interrupt 2 input
P11 (SEG30)	I/O (Output)	External interrupt 1 input
P10 (SEG31)	I/O (Output)	
P22 (XTOUT)	I/O (Output)	Resonator connecting pins (32.768 kHz)
P21 (XTIN)	I/O (Input)	For inputting external clock, XTIN is used and XOUT is opened.
P20 (INT5, STOP)	I/O (Input)	External interrupt input 5 or STOP mode release signal input
P36 (COM7, MUL6)	I/O (I/O)	External interrupt 3 input
P35 (COM6, MUL5)	I/O (I/O)	External interrupt 2 input
P34 (COM5, MUL4)	I/O (I/O)	External interrupt 1 input
P33 (SEG51, MUL3)	I/O (I/O)	Timer / counter 6 input / output
P32 (SEG50, MUL2)	I/O (I/O)	Timer / counter 4 input / output
P31 (SEG49, MUL1)	I/O (I/O)	When used as a LCD segment output, the P3LCR must be set to "1".
P30 (SEG48, MUL0)	I/O (Output)	Timer / counter 3 input / output Divider output
P57 (SEG16) to P50 (SEG23)	I/O (Output)	8-bit input / output port with latch. When used as a LCD segment output, the P5LCR must be set to "1".
P67 (AIN7, STOP5)	I/O (Input)	STOP5 input
P66 (AIN6, STOP4)	I/O (Input)	STOP4 input
P65 (AIN5, STOP3)	I/O (Input)	STOP3 input
P64 (AIN4, STOP2)	I/O (Input)	STOP2 input
P63 (AIN3, INT0)	I/O (Input)	External interrupt 0 input
P62 (AIN2, ECNT)	I/O (Input)	
P61 (AIN1, ECIN)	I/O (Input)	Timer / counter 1 input
P60 (AIN0)	I/O (Input)	
P70 (COM8)	I/O (Output)	
P71 (COM9, MUL0)	I/O (I/O)	Divider output
P72 (COM10, MUL1)	I/O (I/O)	Timer / counter 3 input / output
P73 (COM11, MUL2)	I/O (I/O)	Timer / counter 4 input / output
P74 (COM12, MUL3)	I/O (I/O)	Timer / counter 6 input / output
P75 (COM13, SI1)	I/O (I/O)	Serial data input
P76 (COM14, SO1)	I/O (Output)	Serial data output
P77 (COM15, SCK1)	I/O (I/O)	Serial clock input / output
SEG29 to SEG0	Output	LCD segment outputs
COM4 to COM0	Output	LCD common outputs
V4 to V1	LCD voltage booster pin	LCD voltage booster pin. Capacitors are required between C0 and C1 pin and V1/V2/V3/V4 pin and GND.
C1 to C0	LCD voltage booster pin	
XIN, XOUT	Input Output	Resonator connecting pins for high-frequency clock. For inputting external clock, XIN is used and XOUT is opened.
RESET	Input	Reset signal input
TEST	Input	Test pin for out-going test. Be fixed to low.
VDD, VSS	Power Supply	+ 5 V, 0 (GND)
VAREF	Power Supply	Analog reference voltage input.

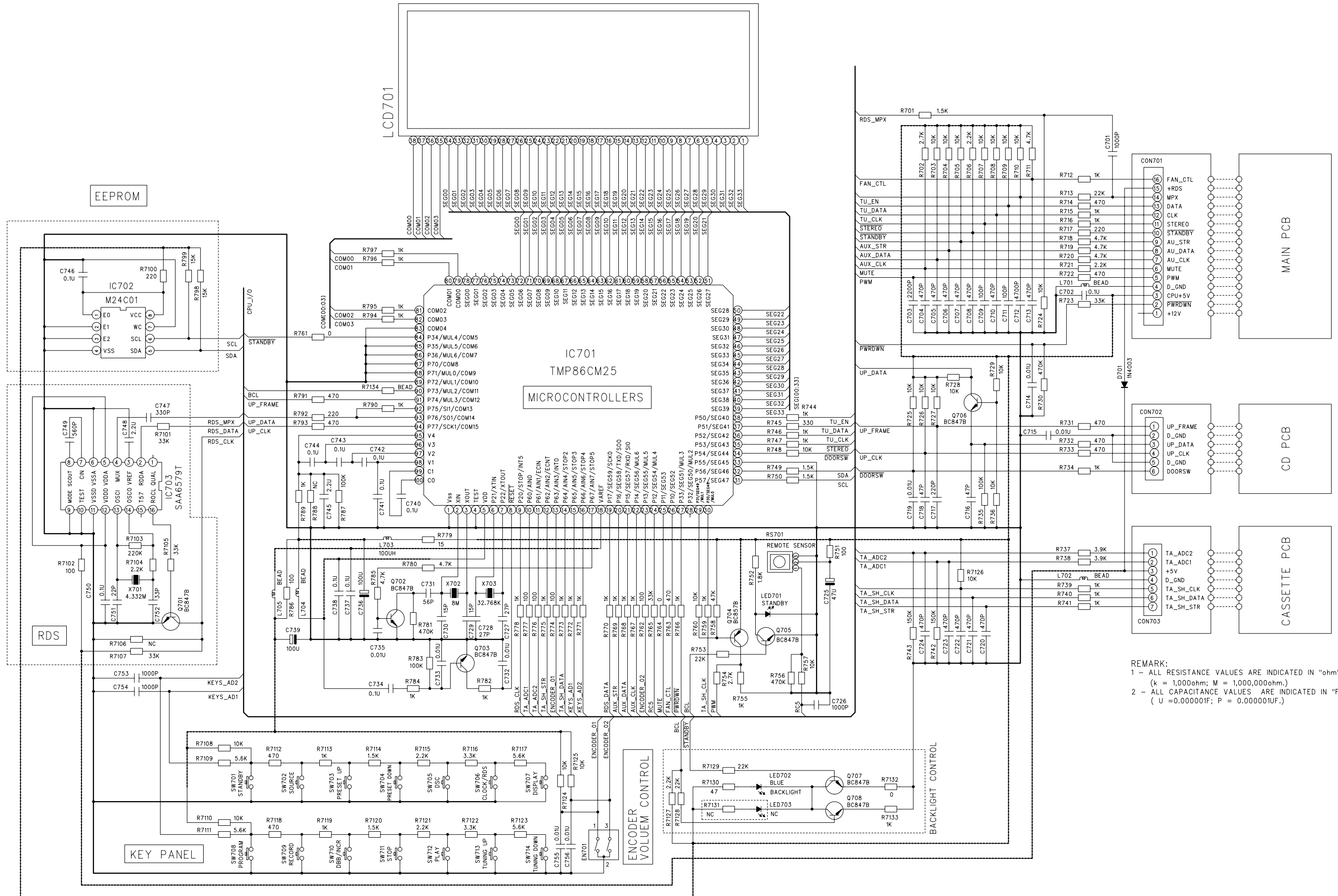
SET BLOCK DIAGRAM



SET WIRING DIAGRAM



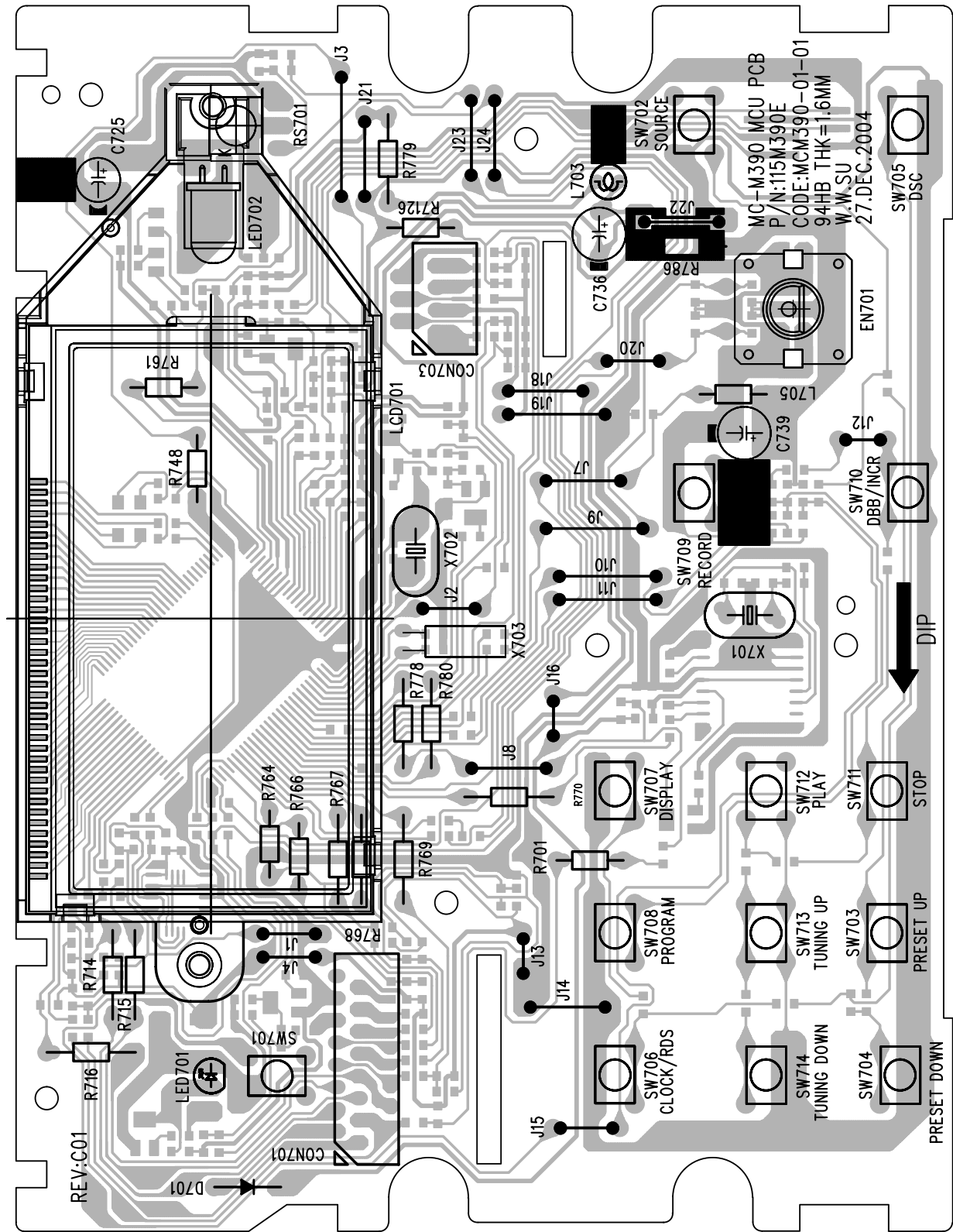
CIRCUIT DIAGRAM - DISPLAY AND MCU BOARD



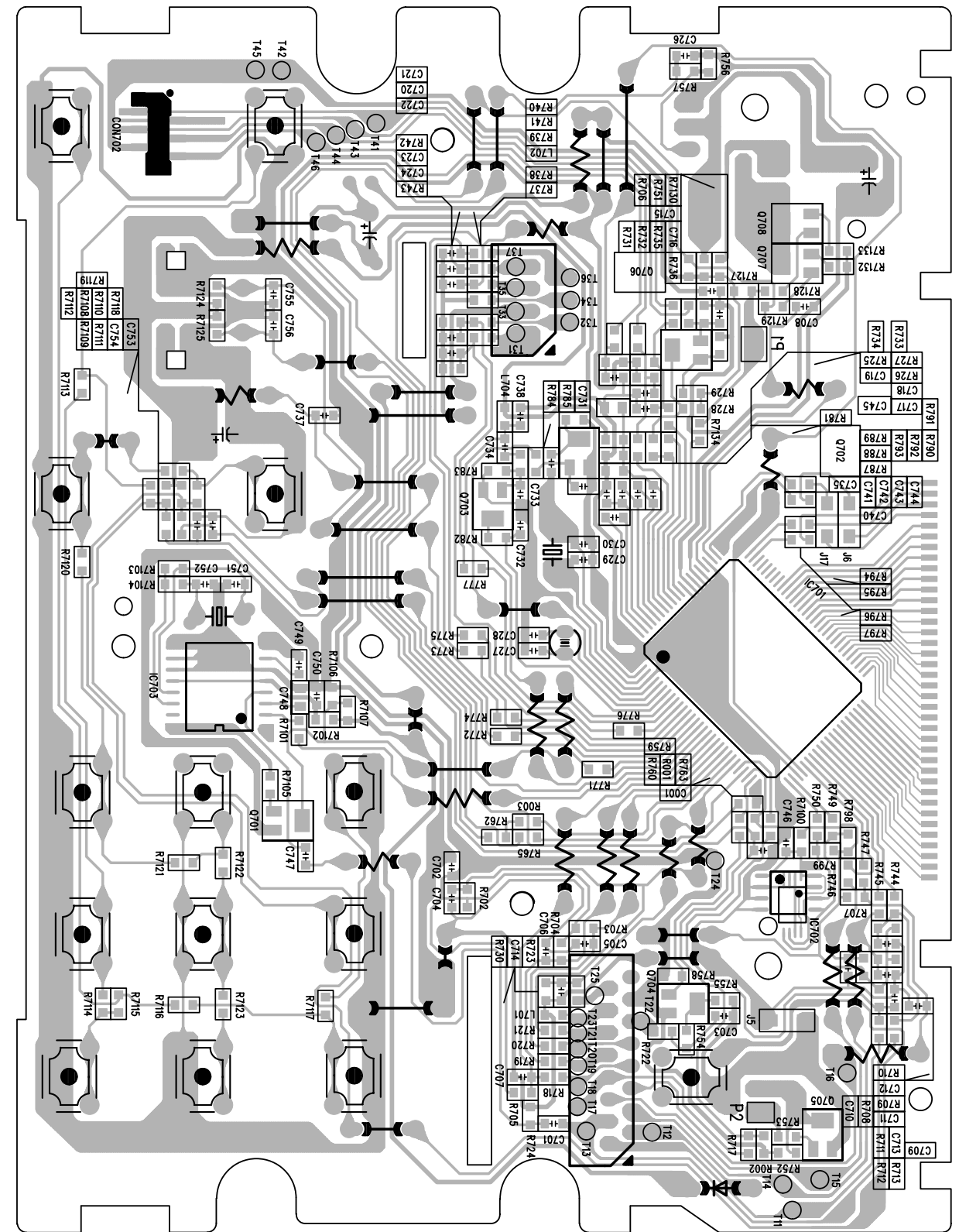
REMARK:
 1 - ALL RESISTANCE VALUES ARE INDICATED IN "ohm".
 (k = 1,000ohm; M = 1,000,000ohm.)
 2 - ALL CAPACITANCE VALUES ARE INDICATED IN "F".
 (U = 0.000001F; P = 0.000001UF.)

LAYOUT DIAGRAM - DISPLAY AND MCU BOARD

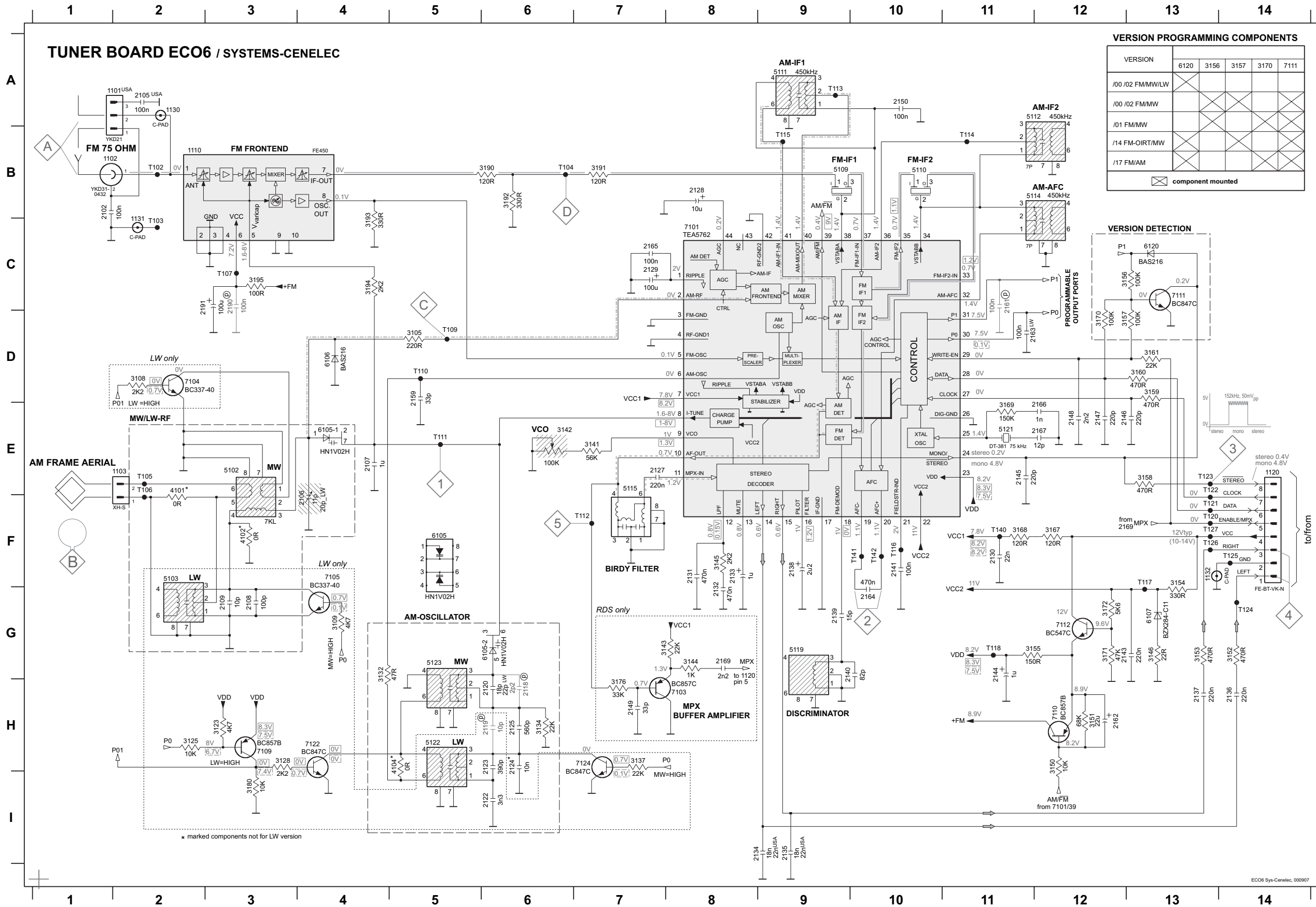
COMPONENT SIDE



COPPER SIDE



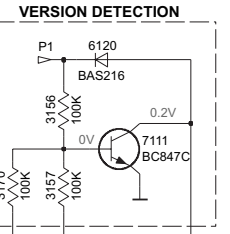
CIRCUIT DIAGRAM - ECO6 SYSTEM CENELEC BOARD



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



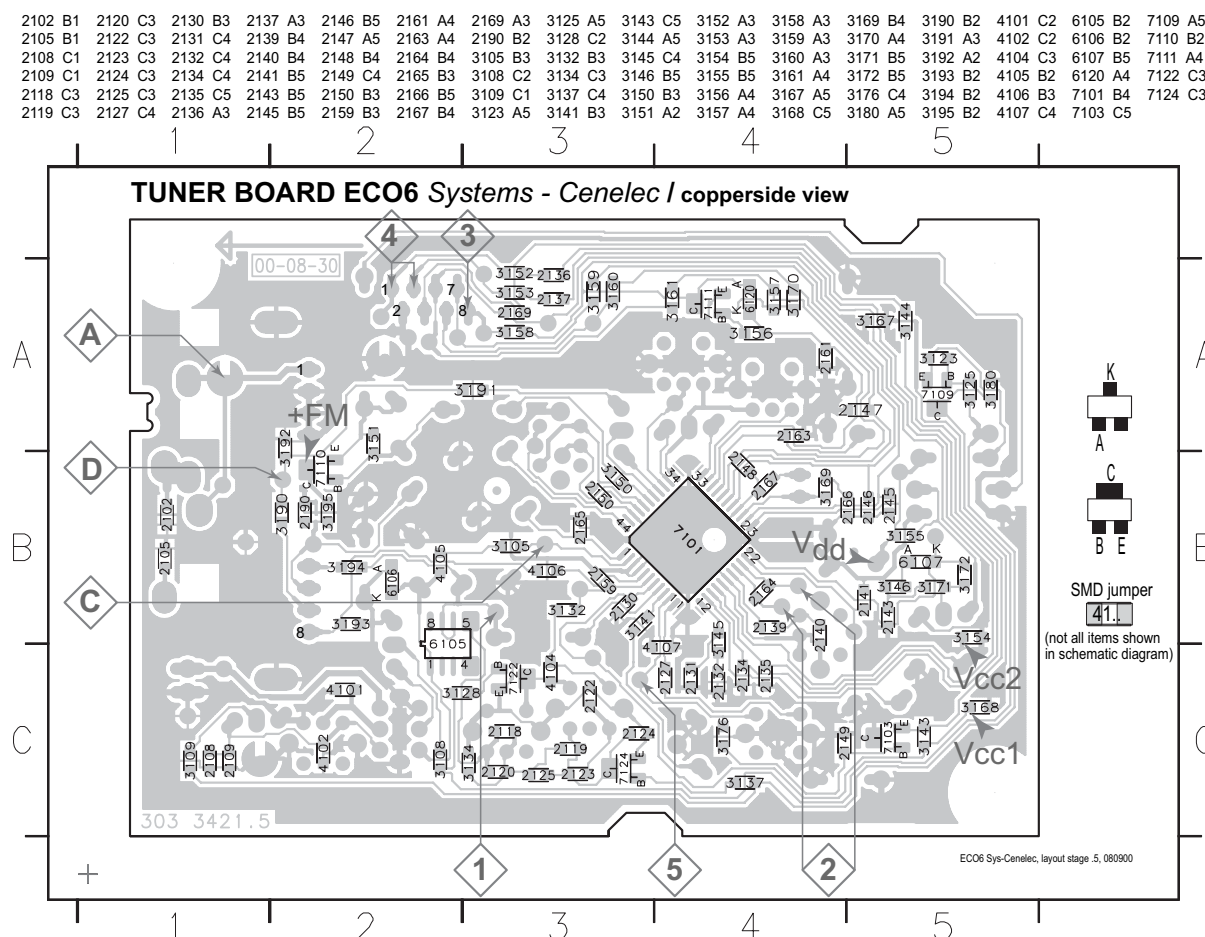
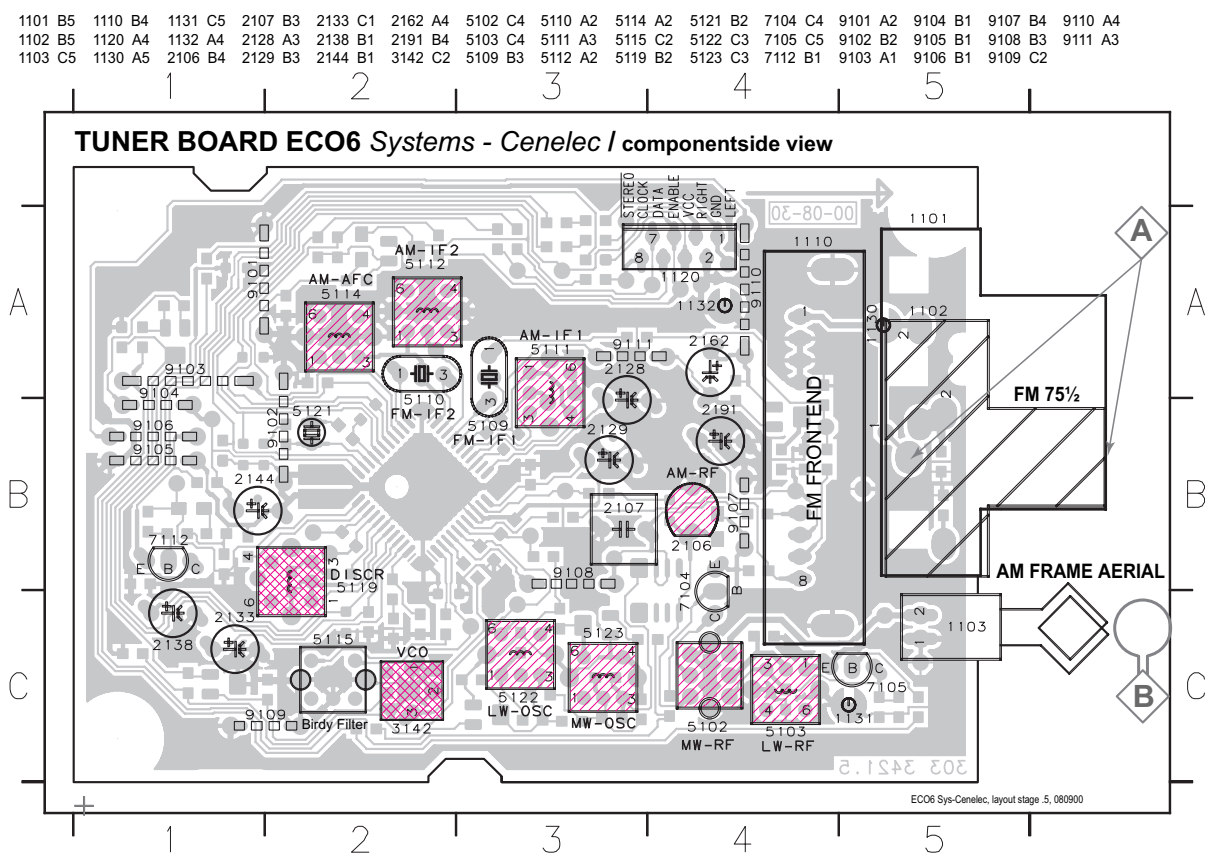
- 1101 A2
- 1102 B1
- 1103 E2
- 1110 B2
- 1120 E4
- 1130 A2
- 1131 C2
- 1132 F13
- 2102 B1
- 2105 A2
- 2106 E3
- 2107 E4
- 2108 G3
- 2109 G3
- 2118 H6
- 2119 H6
- 2120 H6
- 2122 I6
- 2123 H6
- 2124 H6
- 2125 H6
- 2127 E7
- 2128 B8
- 2129 C7
- 2130 F11
- 2131 F8
- 2132 F8
- 2133 F8
- 2134 I8
- 2135 I9
- 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 C11
- 2162 H12
- 2163 D11
- 2164 G10
- 2165 C7
- 2166 E11
- 2167 E11
- 2169 G8
- 2190 C3
- 2191 C3
- 3105 D5
- 3108 D2
- 3109 G4
- 3123 H3
- 3125 H2
- 3128 H3
- 3132 G4
- 3134 H6
- 3137 H7
- 3141 E7
- 3142 E6
- 3143 G7
- 3144 G8
- 3145 F8
- 3146 G3
- 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 F11
- 3168 F12
- 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
- 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 H4
- 7124 H7
- 7112 B2
- 7104 B6
- 7105 E2
- 7106 E2
- 7107 C3
- 7109 D5
- 7110 D5
- 7111 E5
- 7112 F7
- 7113 A9
- 7114 B11
- 7116 F10
- 7117 F13
- 7118 G11
- 7120 F13
- 7121 F13
- 7122 E13
- 7123 E13
- 7124 G14
- 7125 F14
- 7126 F13
- 7127 F13
- 7140 F11
- 7141 F10
- 7142 F10

LEGEND

- * ... only assembled in FM/AM-version
- Ⓧ ... for provision only
- USA ... for USA version only
- LW ... for LW version only
- SMD jumper
- 41xx
- OR
- 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

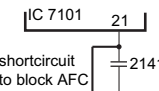
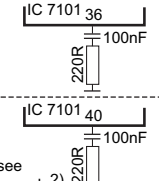
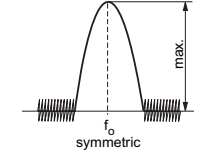
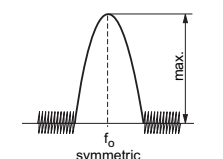
ECO6 Sys-Cenelec, 000607

LAYOUT DIAGRAM - ECO6 SYSTEM CENELEC BOARD



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

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

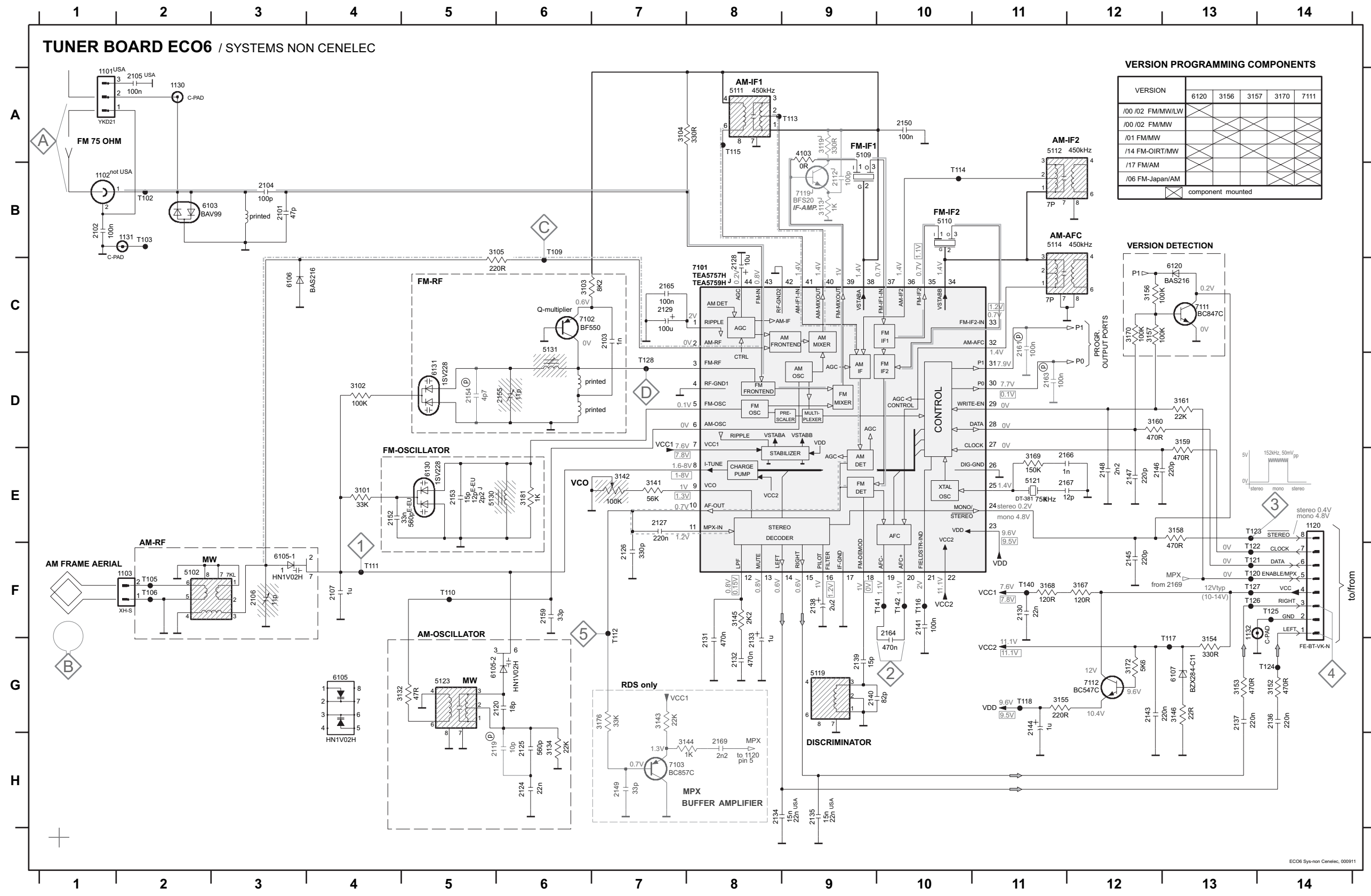
Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check		8V ±1.2V
			87.5MHz	check		1.6V ±0.5V
MW 531 - 1602kHz (9kHz grid)			1602kHz	5123	1	8V ±0.2V 3-band 6.9V ±0.2V 2-band
			531kHz	check		1.1V ±0.4V
LW 153 - 279kHz (3kHz grid)			279kHz	5122		8V ±0.2V
			153kHz	check		1.1V ±0.4V
FM - IF						
FM	10.7MHz, 45mV continuous wave	D		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 3.3k½ to Vcc	C		5111	5	
				5112		
AM AFC MW		C		5114	2	0mV ±2mV
AM RF³⁾						
MW	1494kHz	B	1494kHz	2106	5	
	558kHz		558kHz	5102		
LW	198kHz		198kHz	5103		

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

CIRCUIT DIAGRAM - ECO6 SYSTEM NON-CENELEC BOARD

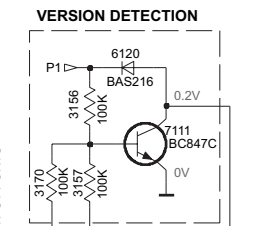


- 1101 A1
- 1102 B1
- 1103 F2
- 1120 E14
- 1130 A2
- 1131 B2
- 1132 G3
- 2101 B3
- 2102 B1
- 2103 C7
- 2104 B3
- 2105 A2
- 2106 F3
- 2107 F4
- 2119 H3
- 2120 G6
- 2124 H6
- 2125 H6
- 2126 F7
- 2127 E7
- 2128 C8
- 2129 C7
- 2130 F11
- 2131 G8
- 2132 C8
- 2133 G8
- 2134 H8
- 2135 H9
- 2136 A14
- 2137 G13
- 2138 F9
- 2139 G9
- 2140 G9
- 2141 F10
- 2143 G12
- 2144 G11
- 2145 F12
- 2146 E12
- 2147 E2
- 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 C14
- 3153 G13
- 3154 G13
- 3155 G11
- 3156 C12
- 3157 C12
- 3158 E13
- 3159 D13
- 3160 D12
- 3161 C13
- 3162 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
- 6103 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 B10
- T115 A8
- T116 F10
- T117 G13
- T118 G11
- T120 F13
- T121 F13
- T122 F13
- T123 E13
- T124 G14
- T125 F14
- T127 F13
- T128 D7

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					
/06 FM-Japan/AM					

component mounted



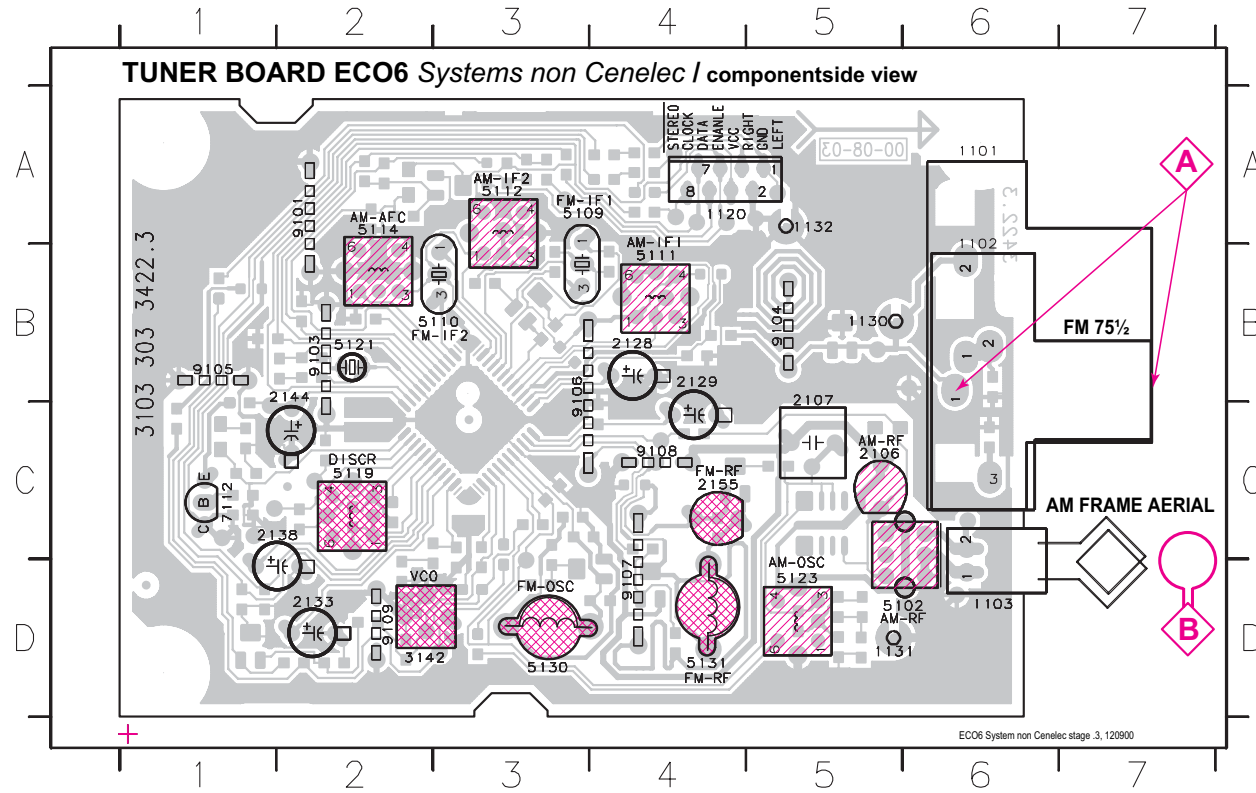
LEGEND

- Ⓧ...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
- Signal path
- FM
- - - AM
- · - · MPX (Audio Frequency)
- ⇒ AF - left/right

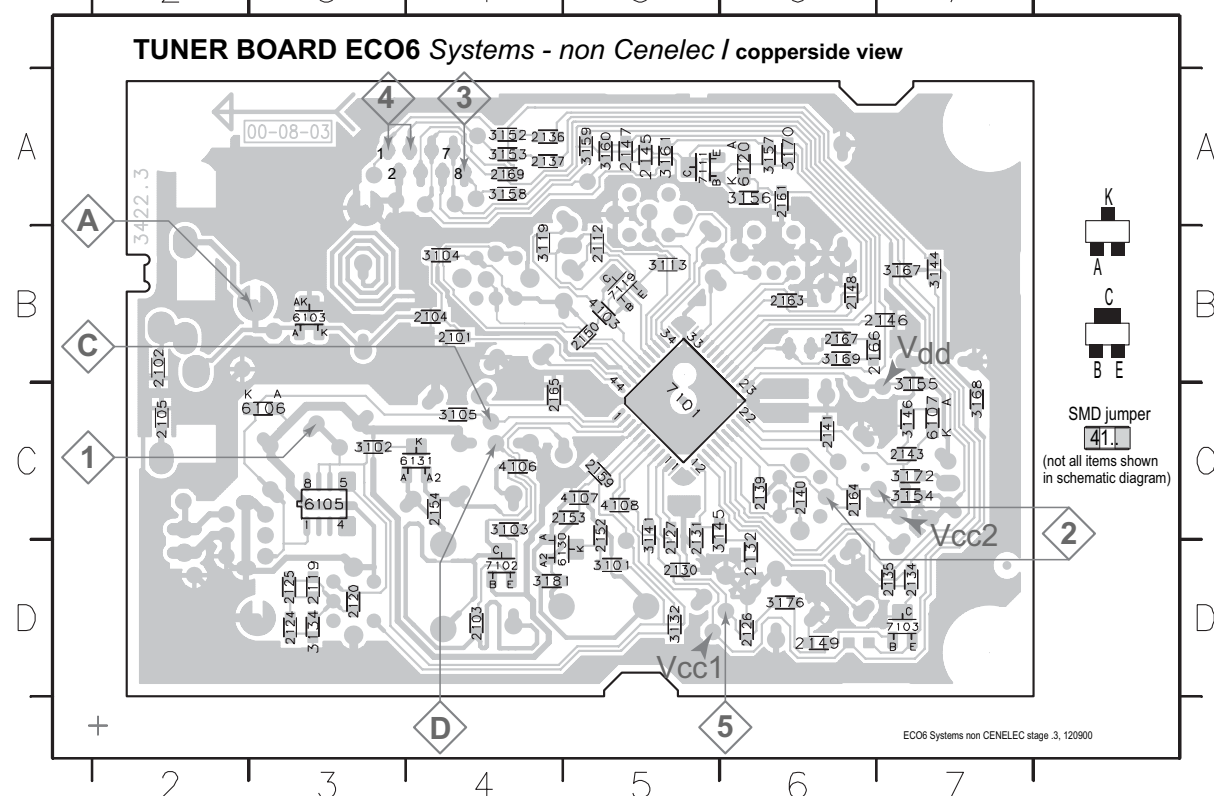
LAYOUT DIAGRAM - ECO6 SYSTEM NON-CENELEC BOARD

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

1101 A6 1103 D6 1130 B5 1132 A5 2107 B5 2129 B4 2138 C2 2155 C4 5102 D6 5110 B3 5112 A3 5119 C2 5123 D5 5131 D4 9101 A2 9104
1102 B6 1120 A4 1131 D5 2106 C5 2128 C4 2133 D2 2144 B2 3142 D2 5109 A3 5111 B4 5114 A2 5121 B2 5130 D3 7112 C1 9103 B2 B5 91



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 2164 C6 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 partlist.

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (65.81 - 74, 87.5 - 108MHz)			108MHz	5130		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	1	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 3.3k½ to Vcc	C		5111	5	
				5112		
AM AFC MW		C		5114	2	0 ± 2 mV DC
AM RF³⁾						
MW⁴⁾ 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	Δf = ±30kHz V _{RF} as low as possible	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

ECO6, Sys + PA with frame aerial, 070799

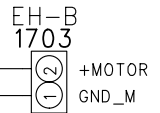
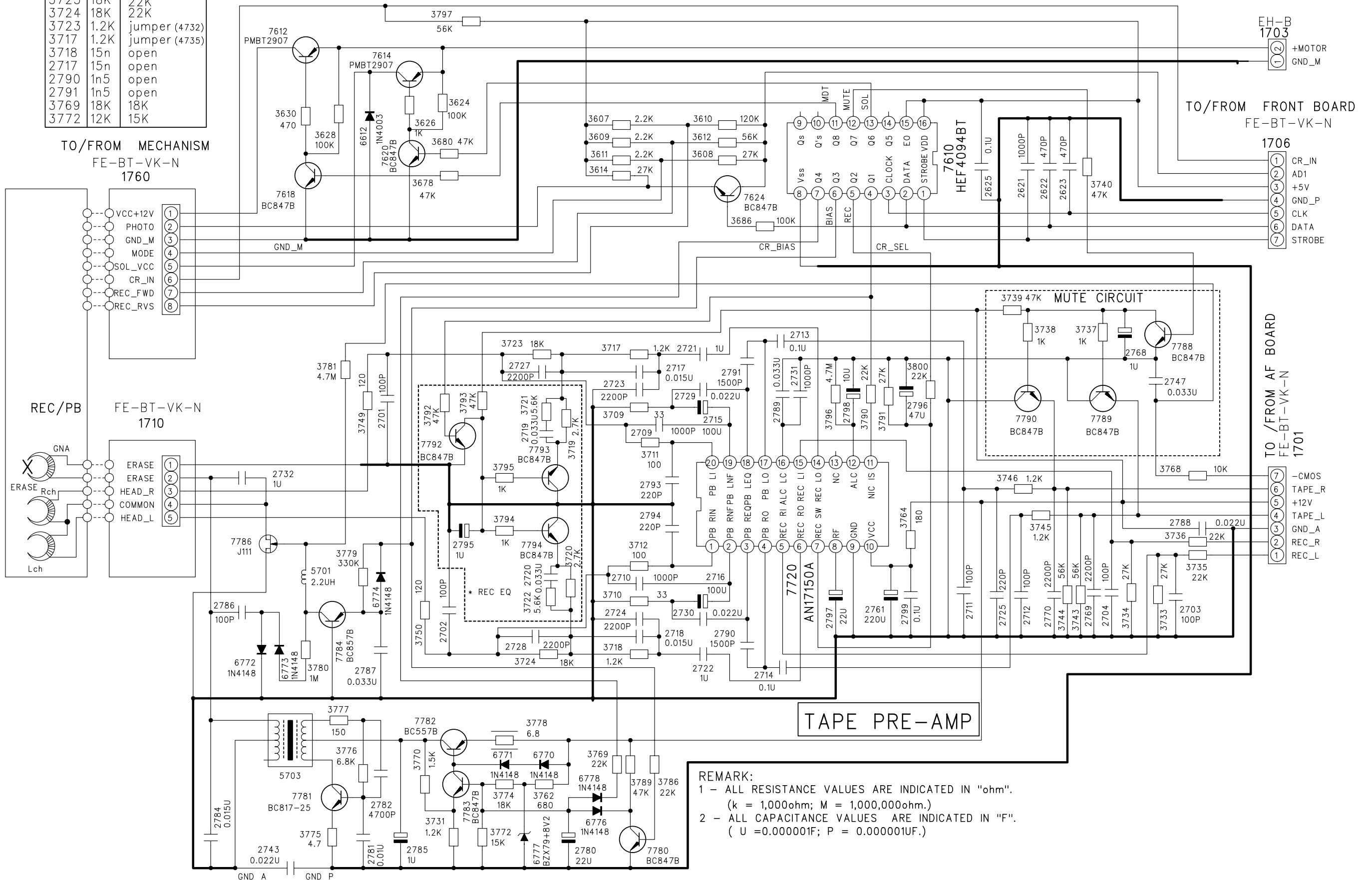
CIRCUIT DIAGRAM - CASSETTE BOARD

Variant Parts between AR d NAR version :please refer to table below

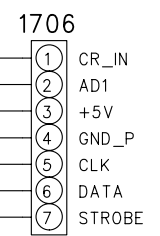
	AR	NAR
3723	18K	22K
3724	18K	22K
3723	1.2K	jumper (4732)
3717	1.2K	jumper (4735)
3718	15n	open
2717	15n	open
2790	1n5	open
2791	1n5	open
3769	18K	18K
3772	12K	15K

*2725/220p

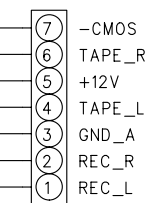
SHIFT REGISTER



TO/FROM FRONT BOARD FE-BT-VK-N



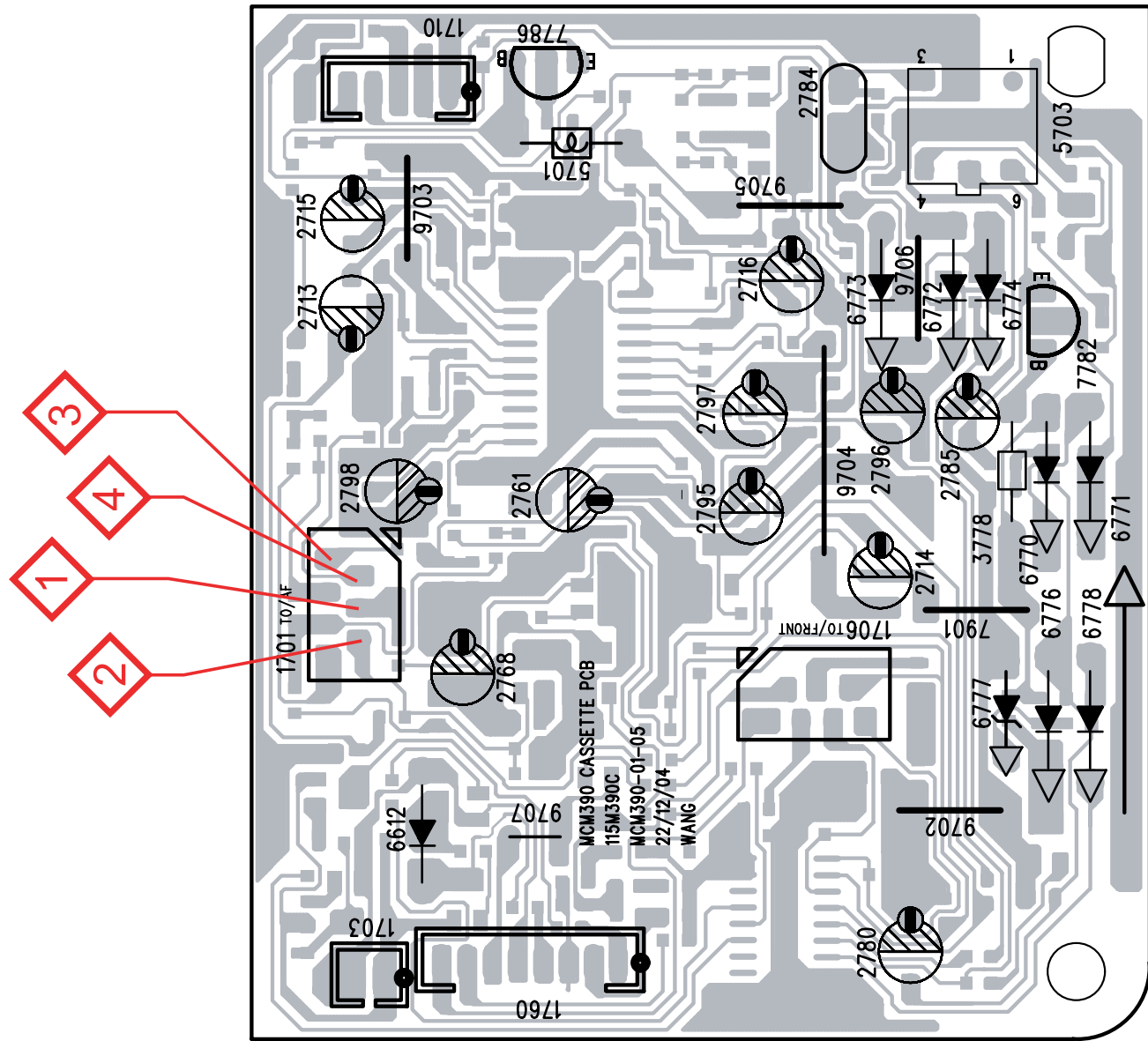
TO /FROM AF BOARD FE-BT-VK-N 1701



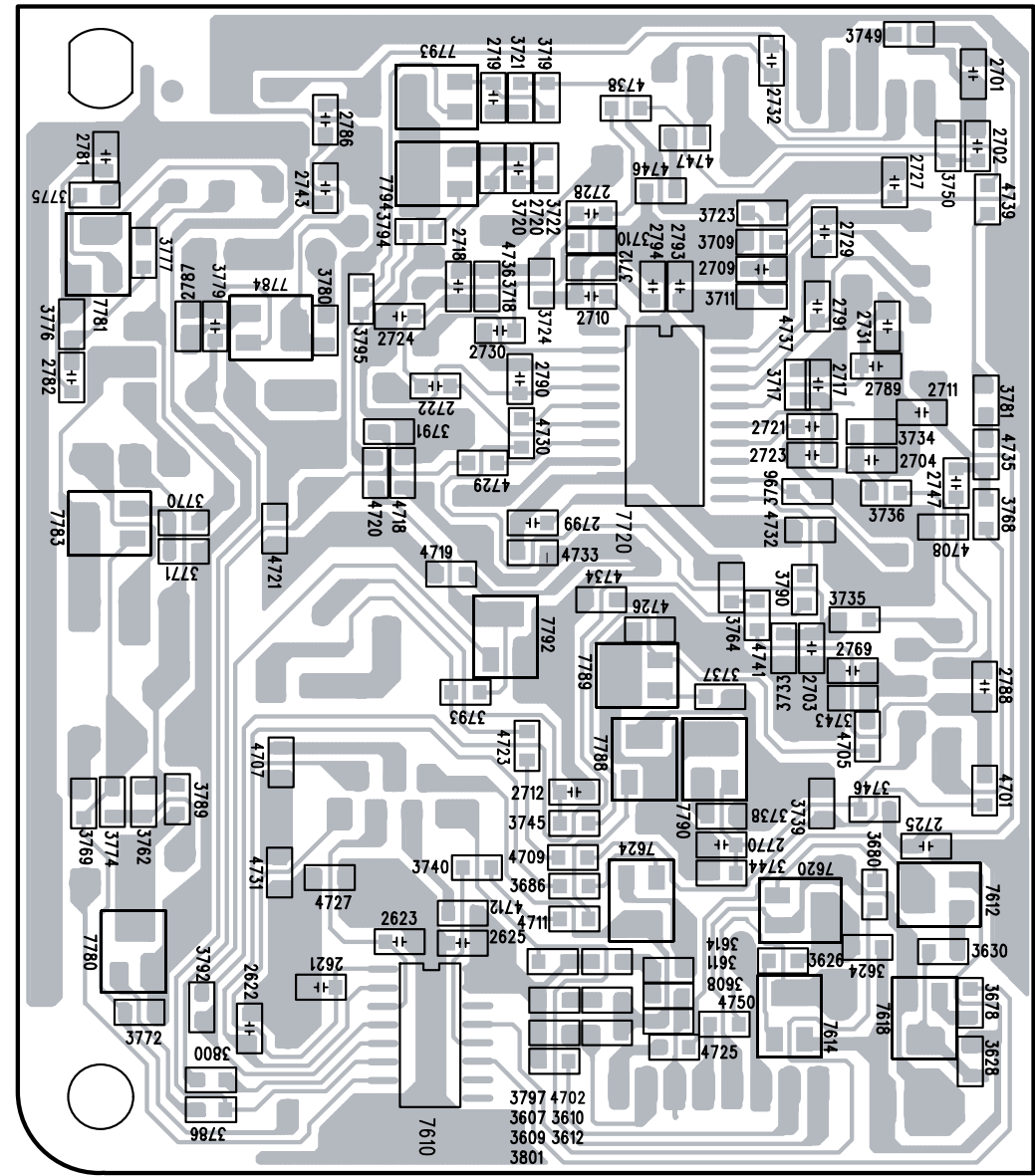
REMARK:
 1 - ALL RESISTANCE VALUES ARE INDICATED IN "ohm".
 (k = 1,000ohm; M = 1,000,000ohm.)
 2 - ALL CAPACITANCE VALUES ARE INDICATED IN "F".
 (U = 0.000001F; P = 0.000001UF.)

LAYOUT DIAGRAM - CASSETTE BOARD

COMPONENT SIDE



COPPER SIDE

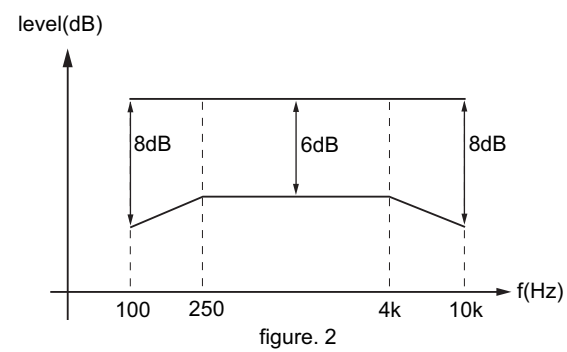
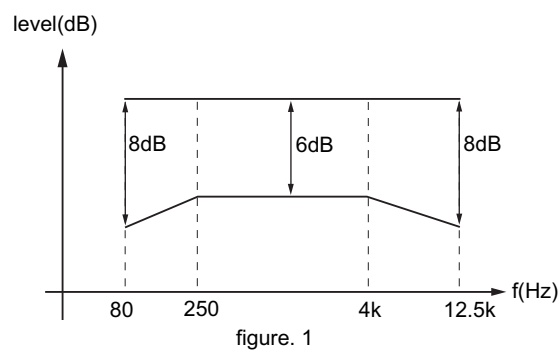


TAPE ADJUSTMENT & CHECK TABLE

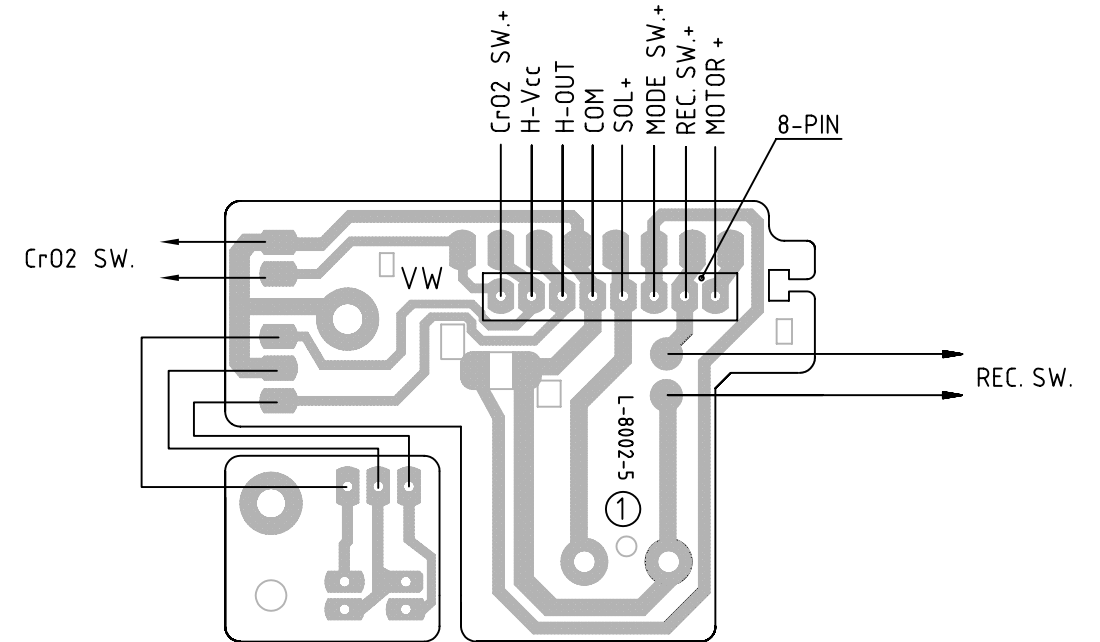
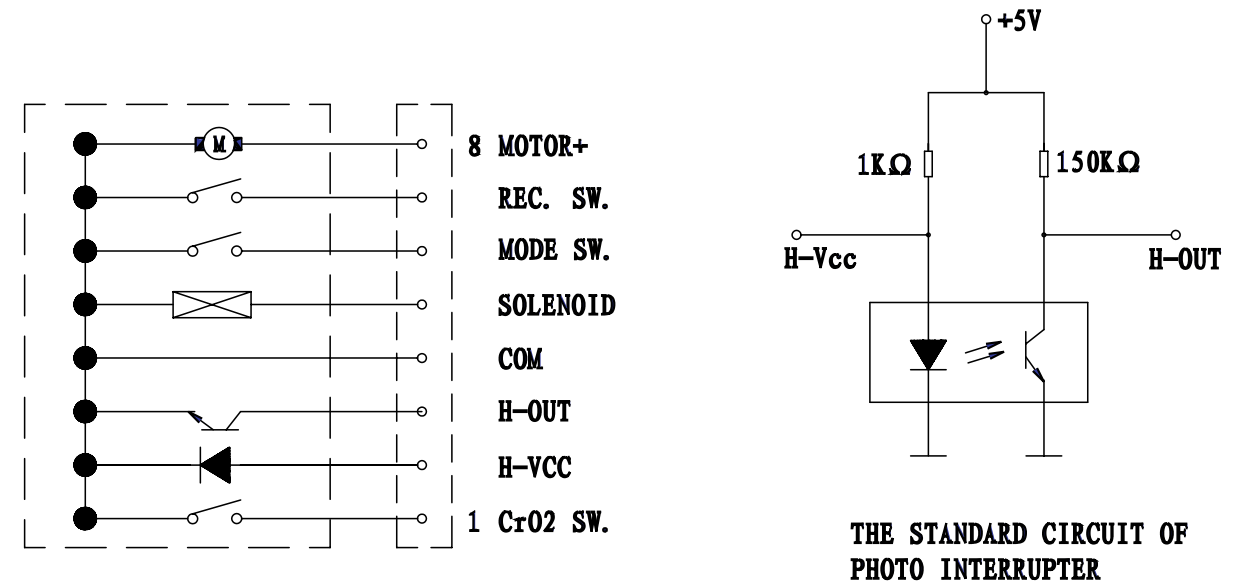
	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
MOTOR SPEED	SBC420 3150Hz	PLAY		frequency counter	check	3150Hz +/- 2%
WOW & FLUTTER	SBC420 3150Hz	PLAY		W&F-meter	check	< 0.4 % DIN
ADJUST AZIMUTH	SBC420 10kHz	PLAY FWD	1 or 2 LEFT RIGHT	mV-meter	left hand screw	max. output level & left=right
		PLAY REV ^			right hand screw	
PLAYBACK LEVEL & FREQ. RESPONSE	SBC420 315Hz	PLAY		mV-meter	check	125mV +/- 3dB (see fig.1 for freq. response)
CHECK RECORD/PLAYBACK FREQUENCY AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	SBC419A or SBC420	RECORD				
	RECORDED CASSETTE	PLAY	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via 3 or 4	SBC419A or SBC420	RECORD				
	RECORDED CASSETTE	PLAY	1 or 2 LEFT RIGHT	THD-meter	check	< 3% *

SBC419A : 4822 397 30069
SBC420 : 4822 397 30071

^ For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure.
If distortion is too high, increase bias and re-measure

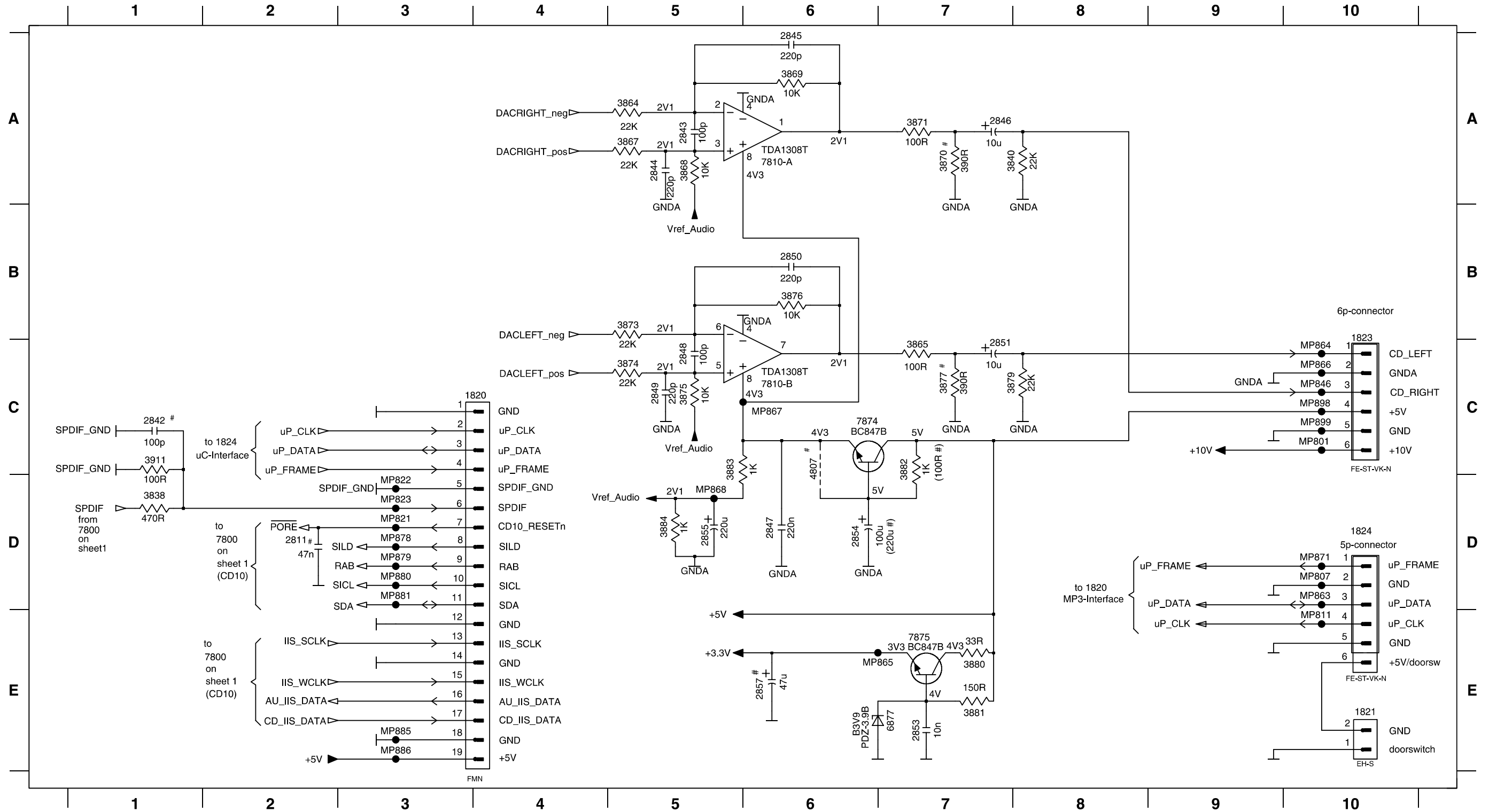


W991S-390 CIRCUIT



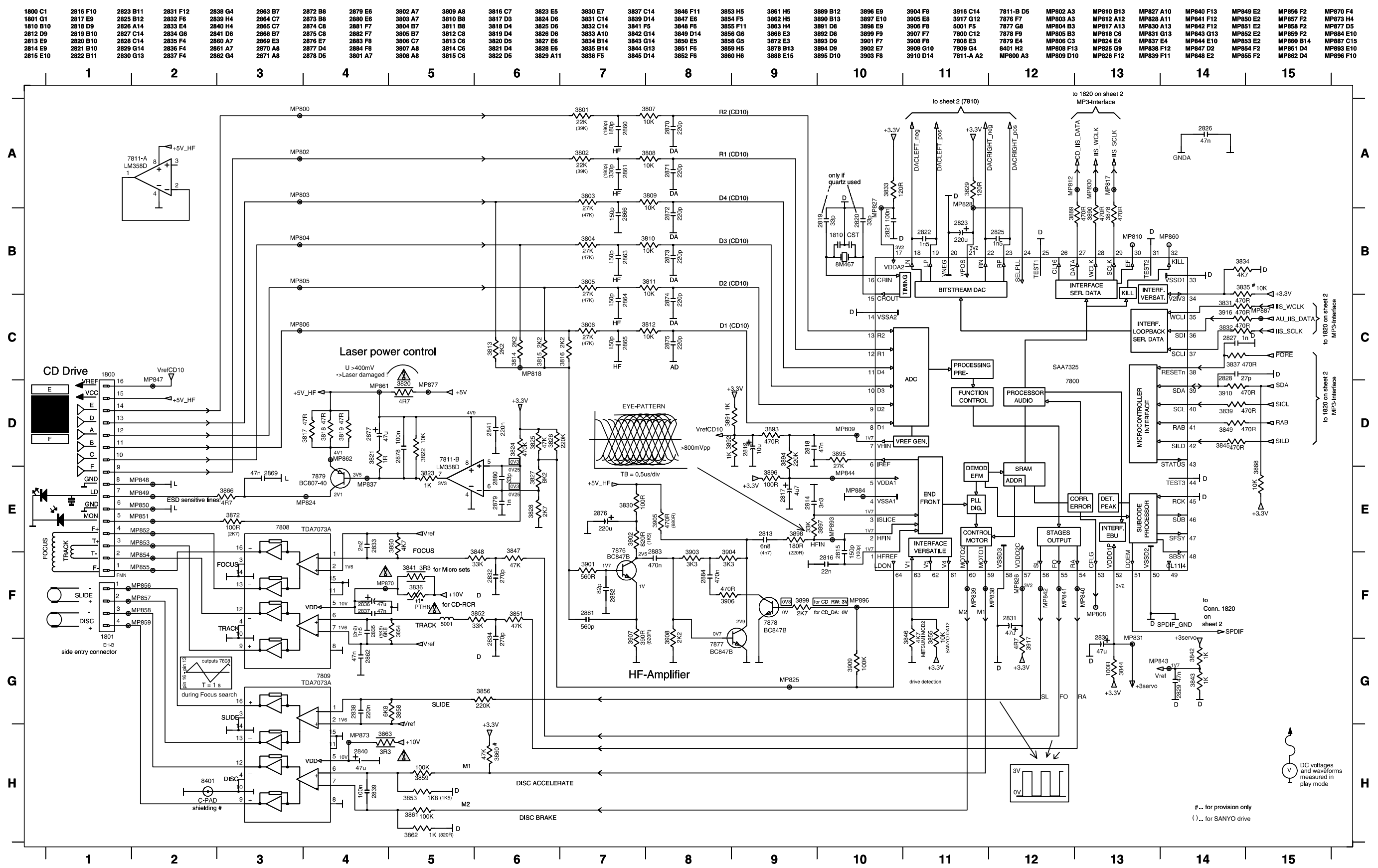
CIRCUIT DIAGRAM - CD BOARD (PART 1)

1820 C3	2811 D2	2845 A6	2849 C5	2854 D6	3840 A7	3868 A5	3873 B5	3877 C7	3882 C7	4807 C6	7874 C6	MP811 E10	MP846 C10	MP866 C10	MP878 D3	MP885 E3
1821 E10	2842 C1	2846 A7	2850 B6	2855 D5	3864 A5	3869 A6	3874 C5	3879 C7	3883 C5	6877 E7	7875 E7	MP821 D3	MP863 D10	MP867 C6	MP879 D3	MP886 E3
1823 C10	2843 A5	2847 D6	2851 C7	2857 E6	3865 C7	3870 A7	3875 C5	3880 E7	3884 D5	7810-A A6	MP801 C10	MP822 D3	MP864 C10	MP868 D5	MP880 D3	MP898 C10
1824 D10	2844 A5	2848 C5	2853 E7	3838 D1	3867 A5	3871 A7	3876 B6	3881 E7	3911 C1	7810-B C6	MP807 D10	MP823 D3	MP865 E6	MP871 D10	MP881 D3	MP899 C10

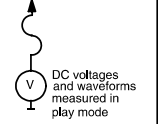


#... for provision only

CIRCUIT DIAGRAM - CD BOARD (PART 2)

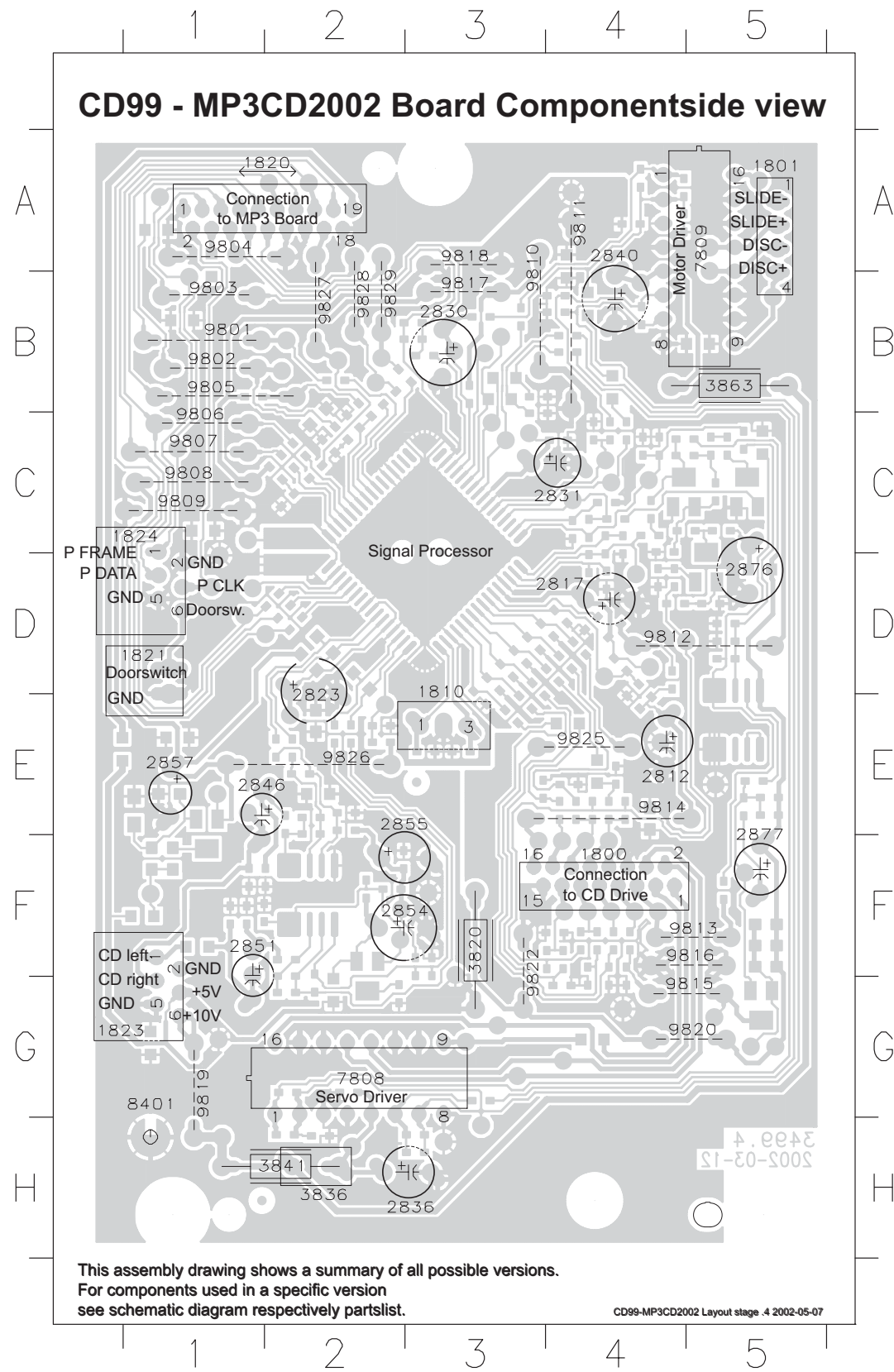


#... for provision only
(...) for SANYO drive



LAYOUT DIAGRAM - CD BOARD

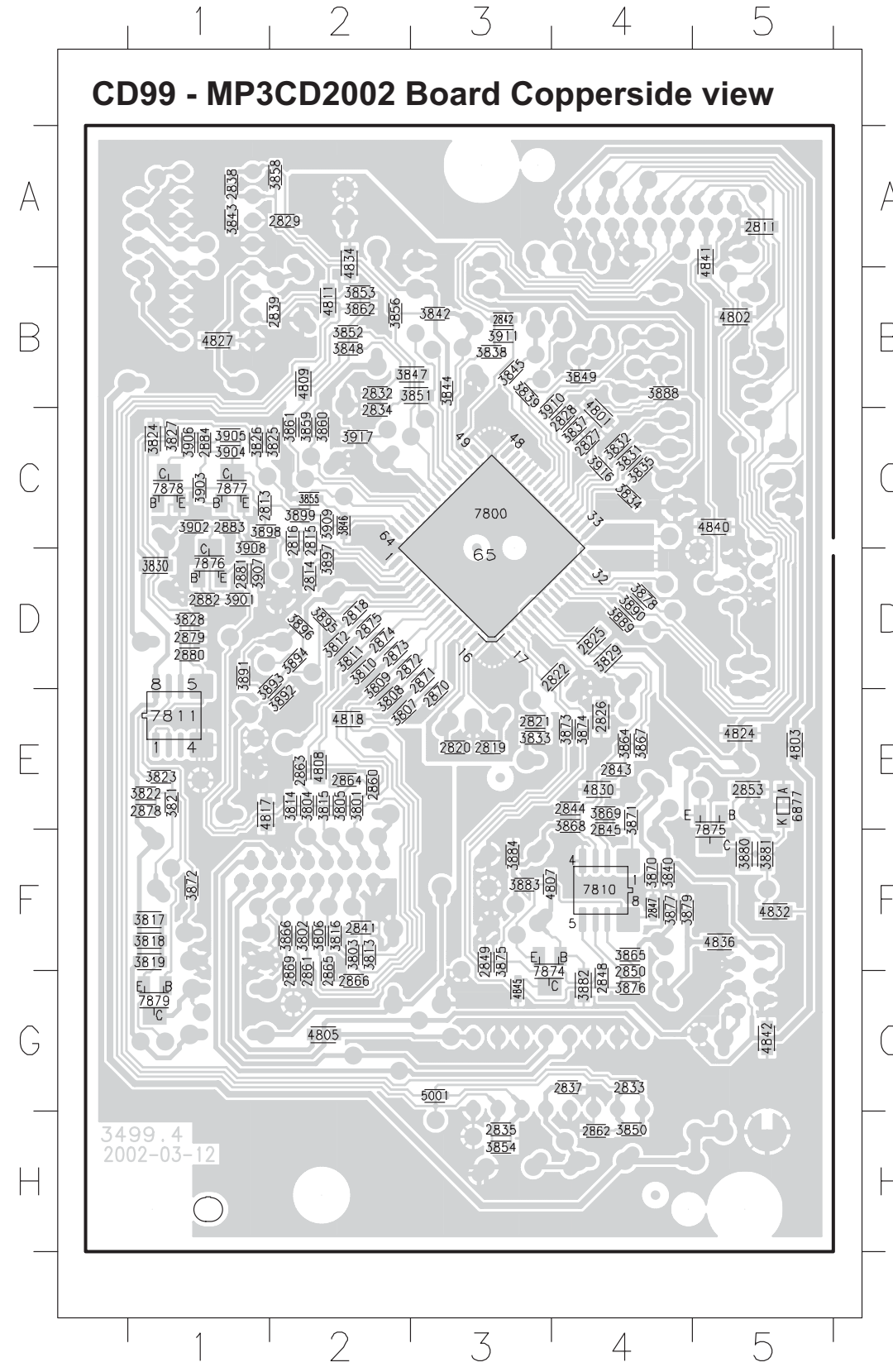
COMPONENT SIDE



Mapping Hole Mounted Components

1800 F4	1821 D1	2817 D4	2836 H3	2854 F3	2877 F5	3863 B5	9801 B1	9805 B2	9809 C1	9813 F5
1801 A5	1823 G1	2823 D2	2840 A4	2855 E3	3820 F3	7808 G4	9802 B1	9806 C1	9810 B4	9814 E4
1810 E3	1824 D1	2830 B3	2846 E2	2857 E1	3836 H2	7809 A5	9803 B1	9807 C1	9811 B4	9815 G5
1820 A2	2812 E5	2831 C4	2851 F2	2876 C5	3841 H2	8401 H1	9804 A2	9808 C1	9812 D5	9816 F5

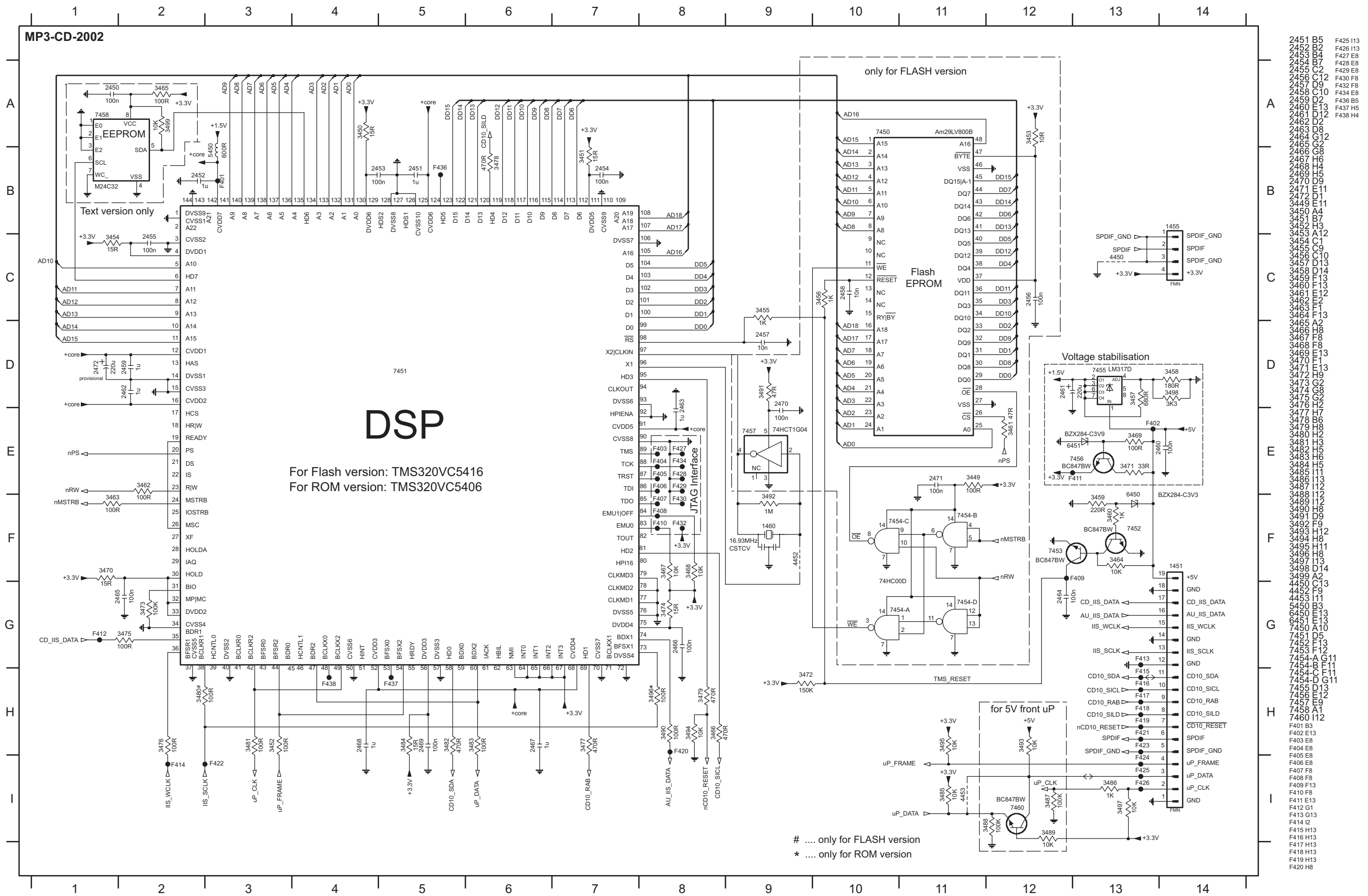
COPPER SIDE



Mapping Chip Components

2811 A5	3845 B3
2813 C1	3846 C2
2814 D2	3847 B3
2815 C2	3848 B2
2816 C2	3849 B4
2818 D2	3850 H4
2819 E3	3851 B3
2820 E3	3852 B2
2821 E3	3853 B2
2822 D4	3854 H3
2825 D4	3855 C2
2826 E4	3856 B2
2827 C4	3858 A2
2828 C4	3859 C2
2829 A2	3860 C2
2832 B2	3861 C2
2833 G4	3862 B2
2834 C2	3864 E4
2835 H3	3865 F4
2837 G4	3866 F2
2838 A1	3867 E4
2839 B2	3868 E4
2841 F2	3869 E4
2842 B3	3870 F4
2843 E4	3871 E4
2844 E4	3872 F1
2845 E4	3873 E4
2847 F4	3874 E4
2848 G4	3875 F3
2849 F3	3876 G4
2850 G4	3877 F4
2853 E5	3878 D4
2860 E2	3879 F4
2861 G2	3880 F5
2862 H4	3881 F5
2863 E2	3882 G4
2864 E2	3883 F3
2865 G2	3884 F3
2866 G2	3888 B4
2869 G2	3889 D4
2870 F3	3890 D4
2871 D3	3891 D1
2872 D2	3892 E2
2873 D2	3893 D2
2874 D2	3894 D2
2875 D2	3895 D2
2878 E1	3896 D2
2879 D1	3897 D2
2880 D1	3898 C1
2881 D1	3899 C2
2882 D1	3901 D1
2883 C1	3902 C1
2884 C1	3903 C1
3801 F2	3904 C1
3802 F2	3905 C1
3803 F2	3906 C1
3804 F2	3907 D1
3805 F2	3908 C1
3806 F2	3909 C2
3807 E2	3910 B3
3808 E2	3911 B3
3809 D2	3916 C4
3810 D2	3917 C2
3811 D2	4801 C4
3812 D2	4802 B5
3813 F2	4803 E5
3814 E2	4805 G2
3815 E2	4807 F3
3816 F2	4808 E2
3817 F1	4809 B2
3818 F1	4811 B2
3819 F1	4817 E1
3821 E1	4818 E2
3822 E1	4824 E5
3823 E1	4827 B1
3824 C1	4830 E4
3825 C2	4832 F5
3826 C1	4834 A2
3827 C1	4836 F5
3828 D1	4840 C5
3829 D4	4841 A5
3830 D1	4842 G5
3831 C4	4845 G3
3832 C4	5001 G3
3833 E3	6877 E5
3834 C4	7800 C4
3835 C4	7810 F4
3837 C4	7811 E1
3838 B3	7874 G3
3839 B3	7875 E5
3840 F4	7876 D1
3842 B3	7877 C1
3843 A1	7878 C1
3844 B3	7879 G1

CIRCUIT DIAGRAM - MP3CD2002 BOARD (For reference only)



- 2451 B5 F425 H13
- 2452 B2 F428 H13
- 2453 B4 F427 E8
- 2454 B7 F428 E8
- 2455 C2 F429 E8
- 2456 C12 F430 F8
- 2457 D9 F432 F8
- 2458 C10 F434 E8
- 2459 D2 F436 B5
- 2460 F13 F437 H5
- 2461 D12 F438 H4
- 2462 D2
- 2463 D8
- 2464 G12
- 2465 G2
- 2466 G8
- 2467 H6
- 2468 H4
- 2469 D9
- 2470 D9
- 2471 E11
- 2472 D1
- 3449 E11
- 3450 A4
- 3451 B7
- 3452 H3
- 3453 A12
- 3454 C1
- 3455 C10
- 3456 C9
- 3457 D13
- 3458 D14
- 3459 F13
- 3460 F13
- 3461 E12
- 3462 E2
- 3463 F13
- 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 G2
- 3477 H7
- 3478 B6
- 3479 H8
- 3480 H2
- 3481 H3
- 3482 H5
- 3483 H6
- 3484 H5
- 3485 H11
- 3486 H13
- 3487 H2
- 3488 H2
- 3489 H2
- 3490 H8
- 3491 D9
- 3492 F9
- 3493 H12
- 3494 H6
- 3495 H8
- 3496 H8
- 3497 H3
- 3498 D14
- 3499 A2
- 4450 C13
- 4452 F9
- 4453 H1
- 4454 B3
- 4455 E13
- 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 D12
- 7457 E9
- 7458 A1
- 7460 H2
- F401 B3
- F402 E13
- F403 E8
- F404 E8
- F405 E8
- F406 E8
- F407 F8
- F408 F8
- F409 F13
- F410 F8
- F411 E13
- F412 G1
- F413 G13
- F414 I2
- F415 H13
- F416 H13
- F417 H13
- F418 H13
- F419 H13
- F420 H8

LAYOUT DIAGRAM - MP3CD2002 BOARD (For reference only)

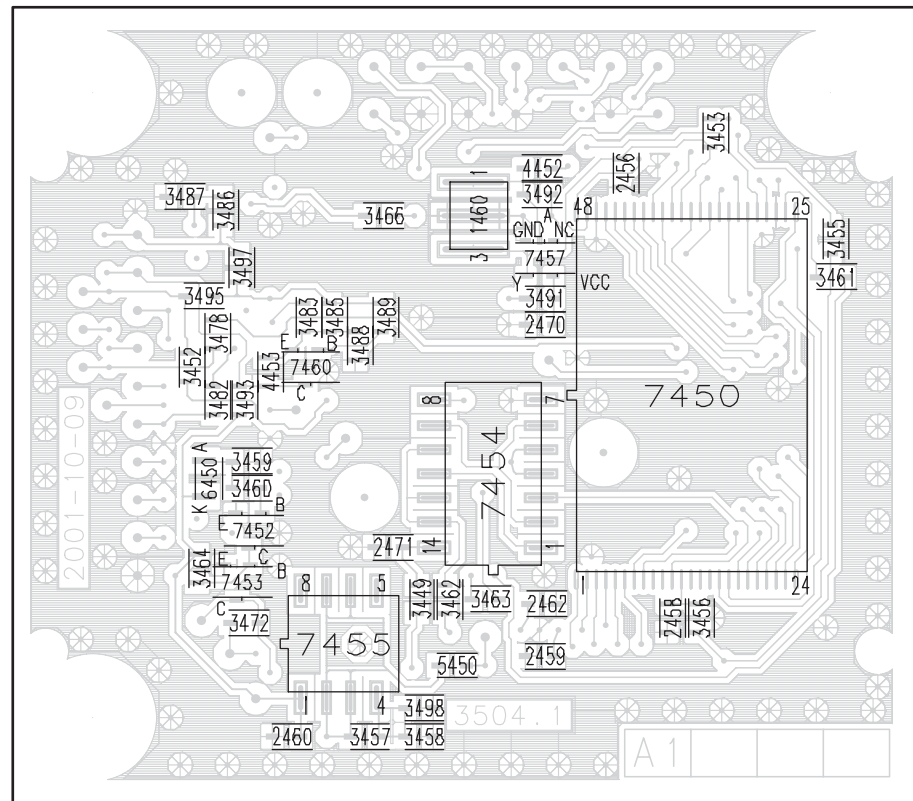
1460 A3	3449 C3	3460 C2	3482 B2	3492 A3	6450 C2
2456 A4	3452 B2	3461 B5	3483 B2	3493 B2	7450 B4
2458 D4	3453 A4	3462 C3	3485 B2	3495 B2	7452 C2
2459 D4	3455 B5	3463 C3	3486 A2	3497 B2	7453 C2
2460 D2	3456 D4	3464 C2	3487 A2	3498 D3	7454 C3
2462 C4	3457 D3	3466 A3	3488 B3	4452 A3	7455 D2
2470 B4	3458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

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	

1 2 3 4 5

Side A

A
B
C
D



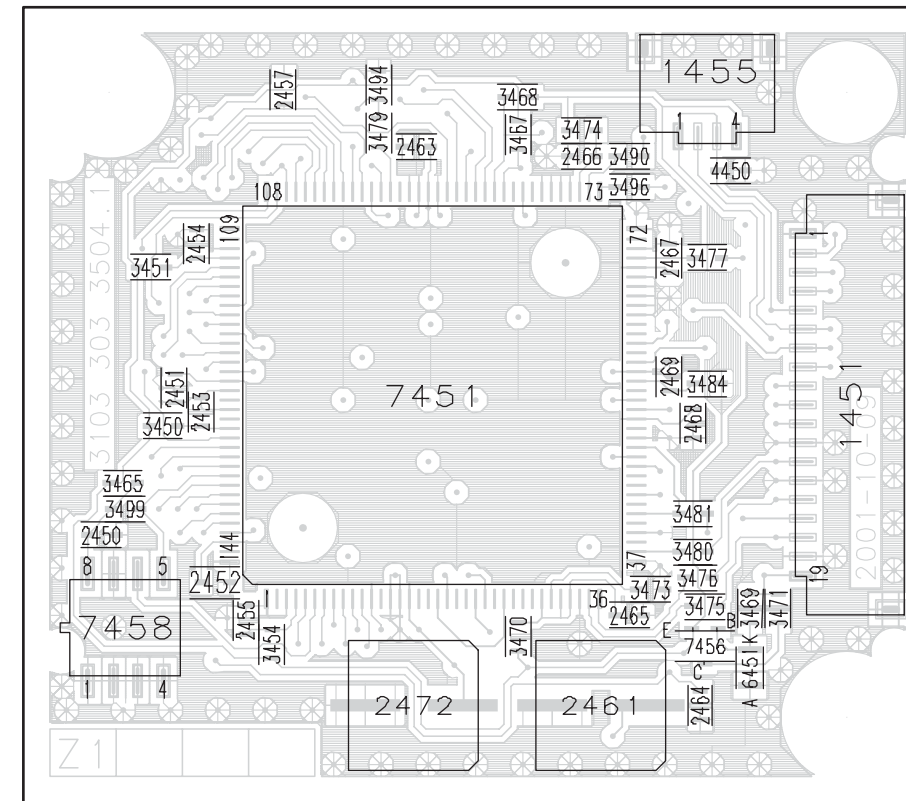
This assembly drawing shows a summary of all possible versions.
For components used in a specific version see schematic diagram
respectively partslist.

1 2 3 4 5

1 2 3 4 5

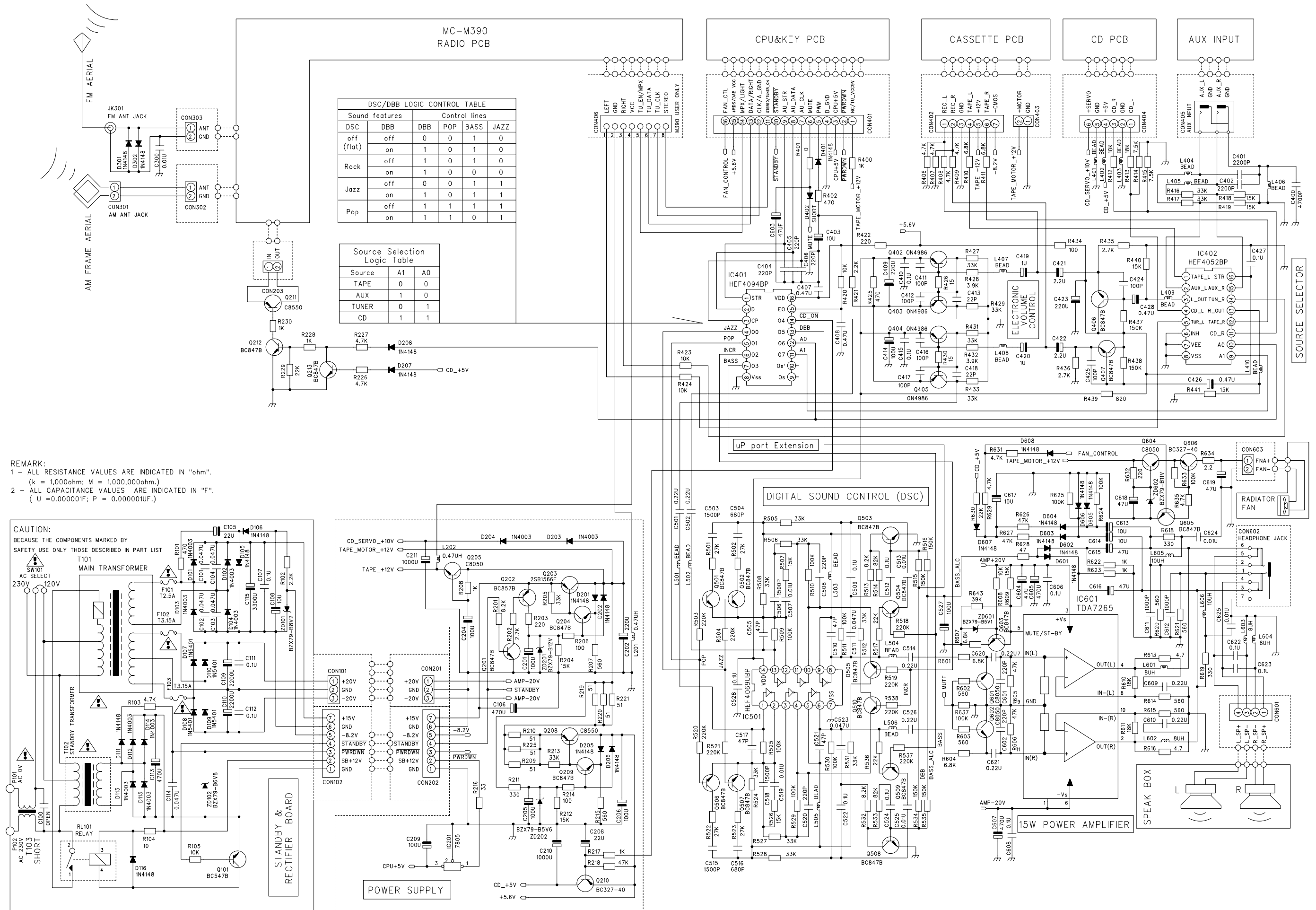
Side B

A
B
C
D

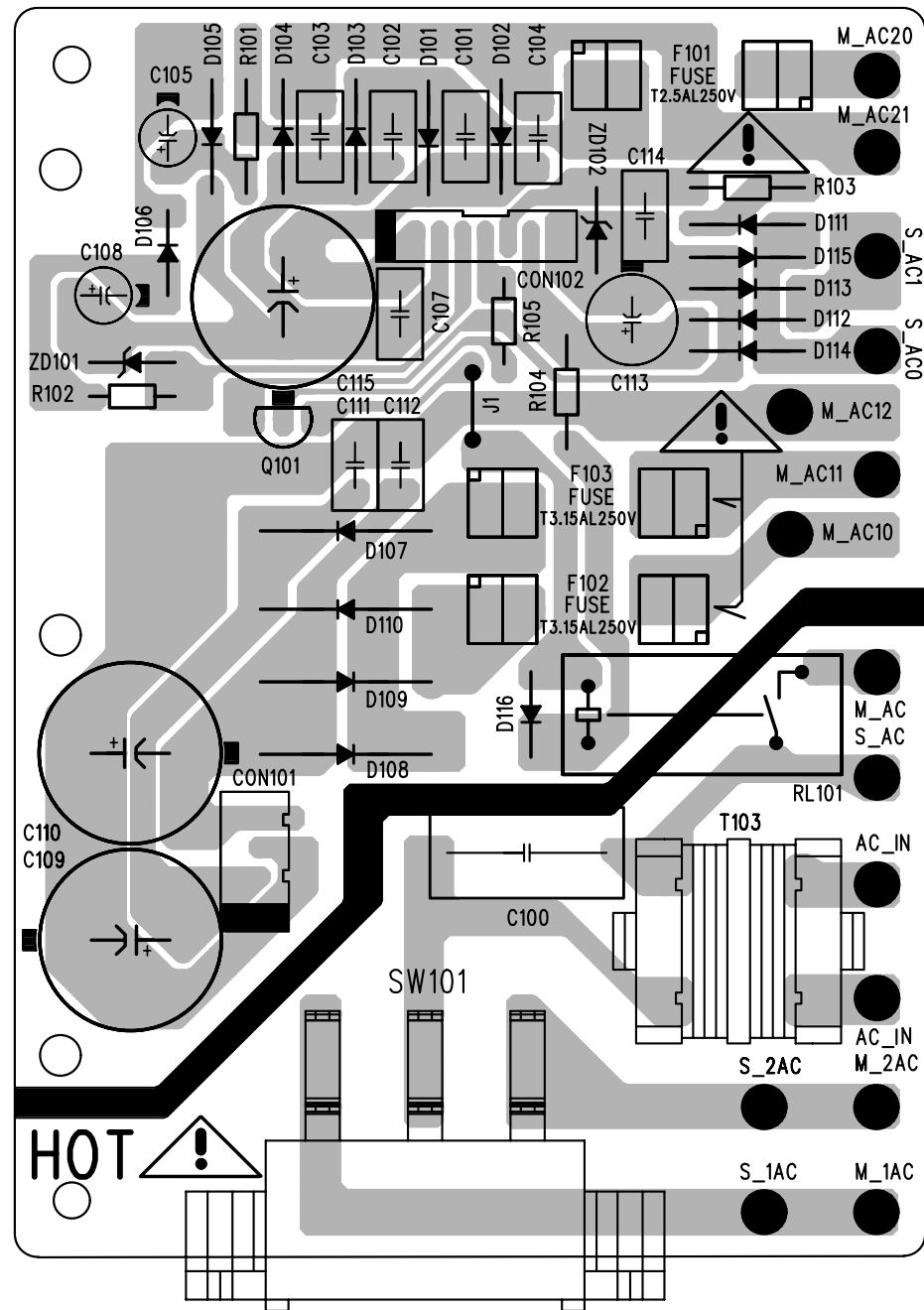


1 2 3 4 5

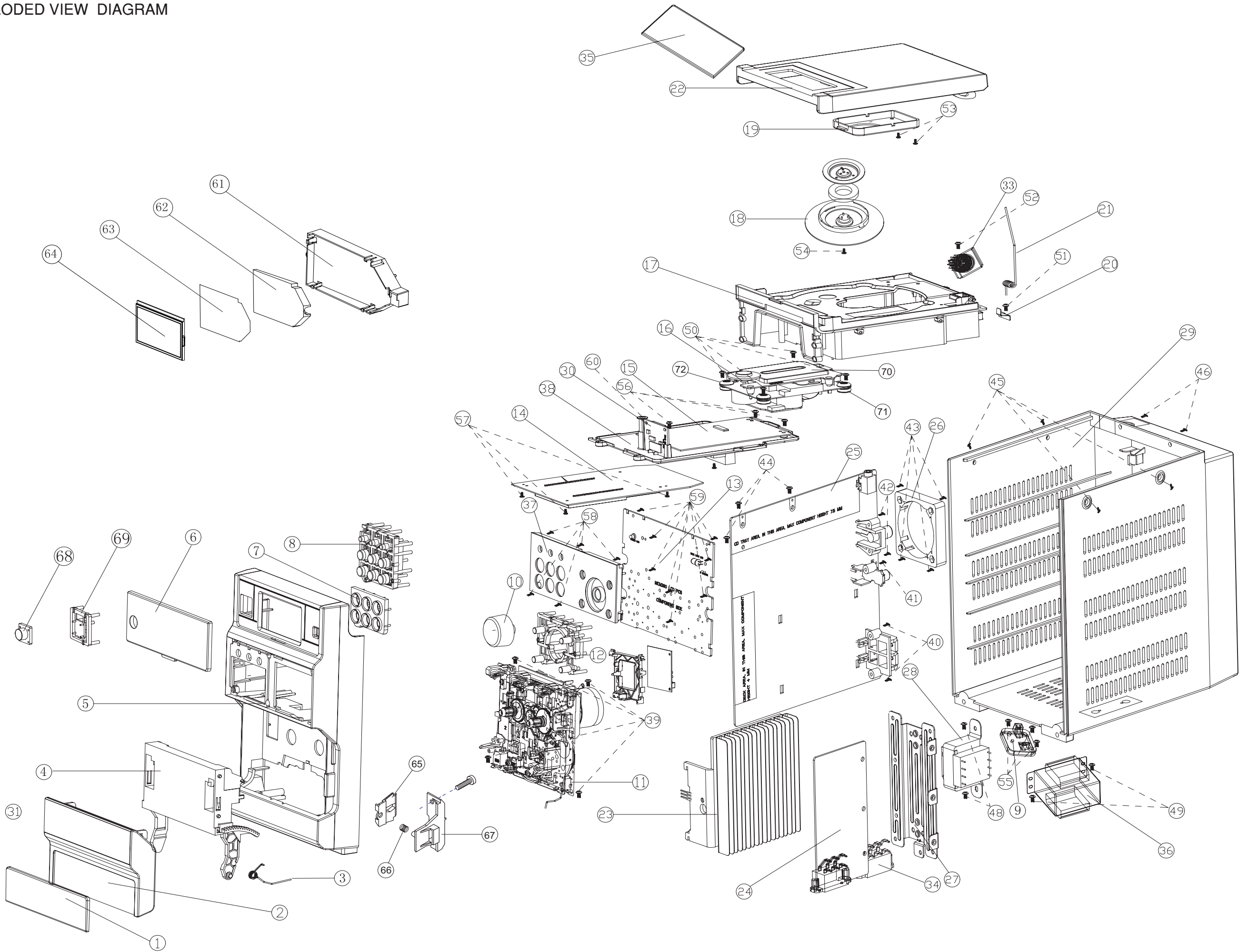
CIRCUIT DIAGRAM - MAIN and POWER BOARD



LAYOUT DIAGRAM - POWER BOARD



EXPLODED VIEW DIAGRAM



ACCESSORIES

9940 000 01418	SPEAKER BOX (LEFT / RIGHT)
9940 000 01419	AM LOOP FRAME ASSY
9940 000 01421	REMOTE CONTROL MCM390

MECHANICAL PARTS LIST

1	9940 000 01398	CASSETTE DOOR LENS /22
1	9940 000 01464	CASSETTE DOOR LENS /21
2	9940 000 01395	CASSETTE DOOR
3	9940 000 01416	CASSETTE DOOR SPRING
4	9940 000 02227	BRACKET-CASSETTE DOOR
5	9940 000 01388	FRONT CABINET
6	9940 000 01397	DISPLAY LENS /22
6	9940 000 01463	DISPLAY LENS /21
7	9940 000 01402	RING-CD FUNCTION
8	9940 000 01401	KEYSET - CD FUNCTION
10	9940 000 01404	KNOB- VOLUME
11	9940 000 01434	CASS MECHANISM W991S-390
12	9940 000 01403	KEYSET - PROGRAM
16	3103 309 05390	CD DA12T3 ASSY
17	9940 000 01393	CD TRAY
18	9940 000 01407	STABILIZER
19	9940 000 01406	BRACKET - MAGNET CLAMPER
20	9940 000 01415	SPRING PLATE FOR CD DOOR
21	9940 000 01414	CD DOOR SPRING
22	9940 000 01392	CD DOOR
29	9940 000 01389	REAR CABINET /22
29	9940 000 01461	REAR CABINET /21
33	9940 000 01411	CD DOOR GEAR
35	9940 000 01396	CD DOOR LENS
37	9940 000 01391	FRONT PANEL /22
37	9940 000 01462	FRONT PANEL /21
38	9940 000 01394	CD TRAY COVER
62	9940 000 01399	LIGHT GUIDE
65	9940 000 01412	PUSH LOCK FOR CASS. DOOR
66	4822 492 11344	SPRING COMPRESSION
67	3140 114 60321	BRACKET- PUSH LOCK
68	9940 000 01405	KNOB-POWER
70	9940 000 01417	DUST COVER FOR DA12N
71	4822 529 10386	DAMPER - RUBBER (30 DEG)
72	4822 529 10387	DAMPER - RUBBER (35 DEG)

ELECTRICAL PARTSLIST

9940 000 01698	CD PCB MCM390/22 ASSY
9940 000 01699	TUNER PCB MCM390/22 ASSY
9940 000 01701	LOGIC DECK PCB MCM390 ASSY
9940 000 01702	MAIN PCB MCM390/22 ASSY
9940 000 01703	DISPLAY PCB MCM390/22 ASSY
9940 000 01427	MP3 DECODER PCB ASSY

CD SERVO BOARD

7800	9352 684 20557	IC SM SAA7325H/T/M2B
7806	4822 209 32852	TDA7073A/N2
7809	4822 209 32852	TDA7073A/N2
7810	4822 209 33165	TDA1308T/N1
7811	5322 209 82941	LM358D
9940 000 01422	CD DOOR SWITCH 1P1T	
9940 000 01423	16P FFC L=70 P1.0	
9940 000 01424	6P FFC CABLE L=190 P1.25	
9940 000 01425	6P FFC CABLE L=200 P1.0	
9940 000 01426	19P FFC CABLE L=80 P1.0	

TUNER BOARD

2106	9965 000 17282	TRIMMER CAP. 10P N450
2155	9965 000 17282	TRIMMER CAP. 10P N450
5102	9940 000 01429	MW ANT COIL BLACK
5103	9940 000 01431	LW ANT COIL PINK 7MM
5110	2422 542 90071	FM FRONTEND FE450-G01
5111	2422 549 44023	AM IF 7MM 450KHZ
5112	4822 157 70302	AM IF F7MCS-12216N
5114	4822 157 70302	AM IF F7MCS-12216N
5115	9940 000 01428	IFT 7MM COIL LPF
5119	4822 157 11443	FM IF 10M7
5122	2422 549 44108	MW OSC COIL
5123	2422 549 44108	LW OSC COIL
5130	2422 549 43772	BOBBIN COIL WHITE 1 1/2T
5131	2422 549 43772	BOBBIN COIL WHITE 1 1/2T
7103	9351 772 20557	IC SM TEA5762H/V1

MAIN BOARD

CON405	9940 000 01457	RCA JACK RED/WHITE
CON601	9940 000 01459	SPEAKER TERMINAL JACK
CON602	9940 000 01456	STEREO H/PHONE JACK
JK301	9940 000 01458	FM 75 OHM ANT JACK
IC201	9940 000 01435	IC S7805P
IC401	5322 209 10421	HEF4094BP
IC402	4822 209 10263	HEF4052BP
IC501	4822 209 10264	HEF4069UBP
IC601	9965 000 15892	IC TDA7265 SGS
Q203	9940 000 01436	TRANSISTOR 2SB1566-F
Q402	9965 000 04928	ON4986
Q403	9965 000 04928	ON4986
Q404	9965 000 04928	ON4986
Q405	9965 000 04928	ON4986

ELECTRICAL PARTSLIST**DISPLAY AND MCU BOARD**

SW701	9940 000 01444	TACT SWITCH
SW702	9940 000 01445	TACT SWITCH
SW703	9940 000 01445	TACT SWITCH
SW704	9940 000 01445	TACT SWITCH
SW705	9940 000 01445	TACT SWITCH
SW706	9940 000 01445	TACT SWITCH
SW707	9940 000 01445	TACT SWITCH
SW708	9940 000 01445	TACT SWITCH
SW709	9940 000 01445	TACT SWITCH
SW710	9940 000 01445	TACT SWITCH
SW711	9940 000 01445	TACT SWITCH
SW712	9940 000 01445	TACT SWITCH
SW713	9940 000 01445	TACT SWITCH
SW714	9940 000 01445	TACT SWITCH
	9940 000 01446	FFC CABLE 16P P1.25 L200
EN701	9940 000 01437	ROTARY ENCODER
IC701	9940 000 01438	TMP86CS25FG-6BR2 M390
IC702	9940 000 01439	M24C01WMN6T EEPROM
IC703	4822 209 31981	SAA6579T
LCD701	9940 000 01441	LCD DISPLAY 81057TT-H
LED701	9940 000 01442	LED 5.25X2.9 RED
LED702	9940 000 01443	LED 5.2X3.4 BLUE OVAL
RS701	9322 155 82667	IR RECEIVER TSOP2236

CASSETTE BOARD

7720	9322 167 09668	IC SM AN17150ATA
5703	9940 000 01432	OSC COIL-RED
7610	5322 209 11306	HEF4094BT
7786	9940 000 01433	TRANSISTOR (FET) J112

RECTIFIER BOARD AND MISCELLANEOUS

D107	9965 000 19419	RETCTIFIER DIODE 1N5401
D108	9965 000 19419	RETCTIFIER DIODE 1N5401
D109	9965 000 19419	RETCTIFIER DIODE 1N5401
D110	9965 000 19419	RETCTIFIER DIODE 1N5401
RL101	△ 9940 000 01448	9V DC RELAY 10A
F101	△ 9940 000 01447	FUSE 2.5A 250V D5X20MM
F102	△ 4822 071 53152	FUSE 3.15A
F103	△ 4822 071 53152	FUSE 3.15A
	9940 000 01452	DC COOLING FAN
	△ 9940 000 01451	VDE POWER CORD
	△ 9940 000 01465	STANDBY TRANSF. /21
	△ 9940 000 01455	STANDBY TRANSF. /22
	△ 9940 000 01466	POWER TRANSF. 230V
	△ 9940 000 01449	POWER TRANSF. 120/230V

