

Service
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Service Manual



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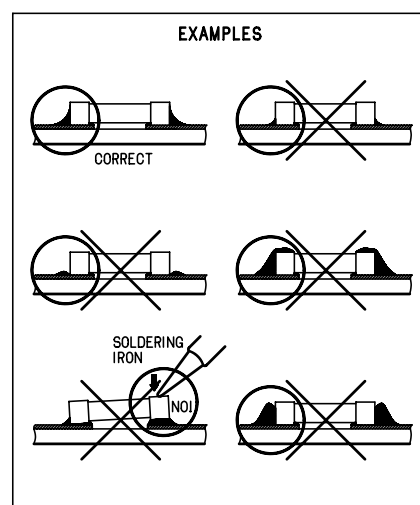
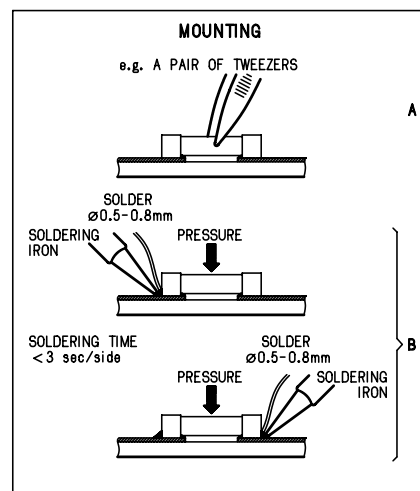
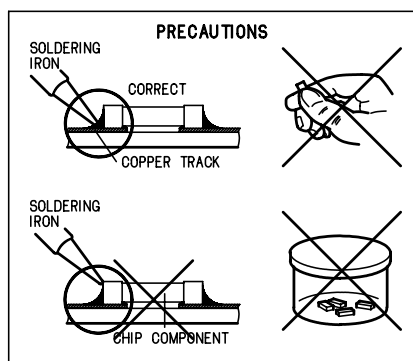
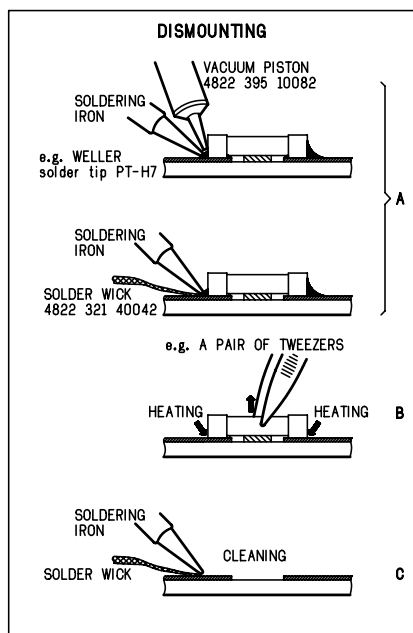
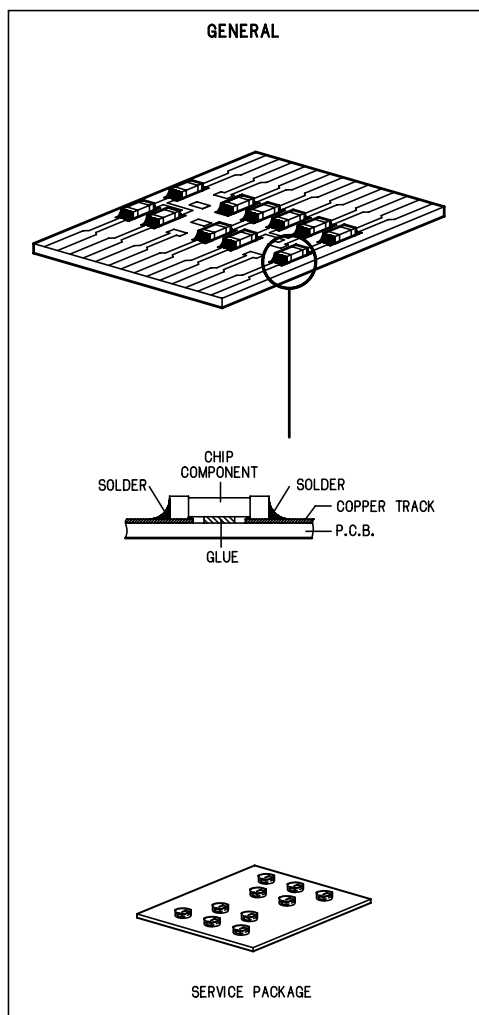
Version 1.0



PHILIPS

**CLASS 1
LASER PRODUCT**

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

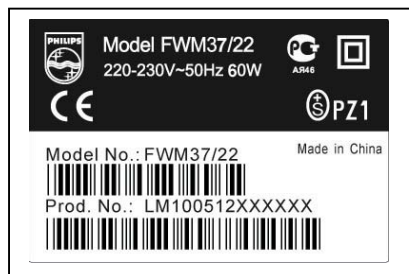
Philips CE is producing lead-free sets from 1.1.2005 onwards.

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.

SPECIFICATIONS

GENERAL:

Mains voltage : 240V
 Mains frequency : 50 Hz
 Power consumption : < 90W max.
 < 8 W at standby
 Clock accuracy : 4 seconds per day
 Dimension center unit : 265 x 295 x 320 mm

AMPLIFIER:

Output power : 2 x 15 W RMS
 Speaker impedance : 3 ohm
 Frequency response
 Within ± 3 dB : 60Hz – 16 kHz
 Dynamic Bass Boost ON : 8dB \pm 3dB at 60Hz

TUNER:

FM

Tuning range : 87.5 – 108 MHz
 IF Frequency : 10.7 MHz \pm 20kHz
 Aerial input : wire
 Sensitivity at 26sb S/N : < 22 dB
 Selectivity at 600 kHz
 Bandwidth : > 45 dB
 IF rejection : > 50 dB
 Image rejection : > 20 dB
 Distortion : < 7 %
 Crosstalk : > 22 dB

MW

Tuning range : 531 – 1602kHz
 Grid : 9 kHz
 IF Frequency : 465 kHz \pm 5 kHz
 Aerial input : Bar antenna
 Sensitivity at 26sb S/N : < 4.4 mV/M
 Selectivity at 18 kHz
 Bandwidth : > 22 dB
 IF rejection : > 45 dB
 Image rejection : > 28 dB
 Distortion : < 5%

CASSETTE RECORDER:

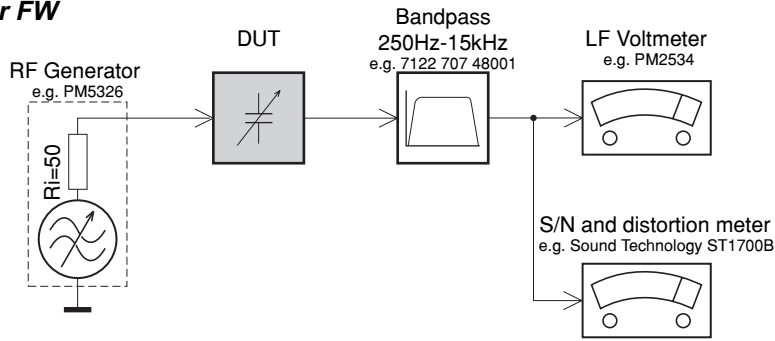
Number of tracks : 2 x 2 stereo
 Tape speed : 4.76 cm/sec +2.5/-1.5%
 Wow and flutter : < 0.35% DIN
 Fast-wind/rewind time : < 130 sec. With C-60
 Bias frequency : 75 \pm 10 kHz
 R/P frequency response : 125 – 8 kHz (8 dB)
 Signal to noise ratio : > 42 dB with type 1 tape

COMPACT DISC:

Number of programming track : 30
 Frequency response
 Within ± 3 dB : 30 Hz – 16 kHz
 Signal/Noise ratio : 76 dB/A-weighted
 Distortion at 1 kHz : < 3%
 Channel separation at 1 kHz : > 25 dB

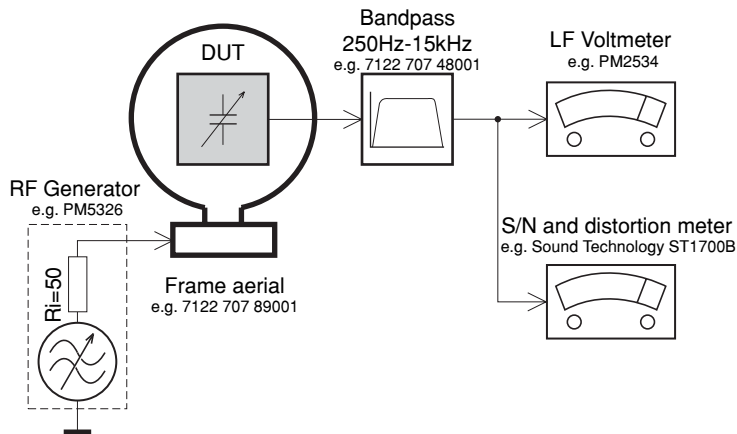
SERVICE MEASUREMENT

Tuner FW



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

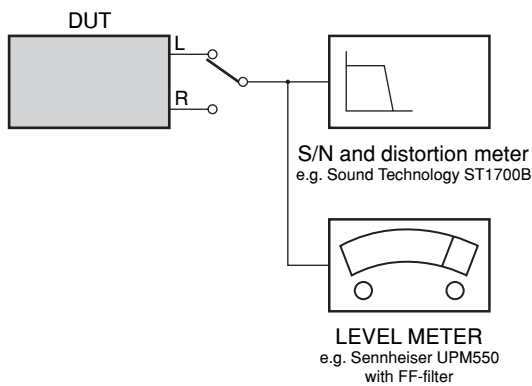
Tuner AM (MW,LW)



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).

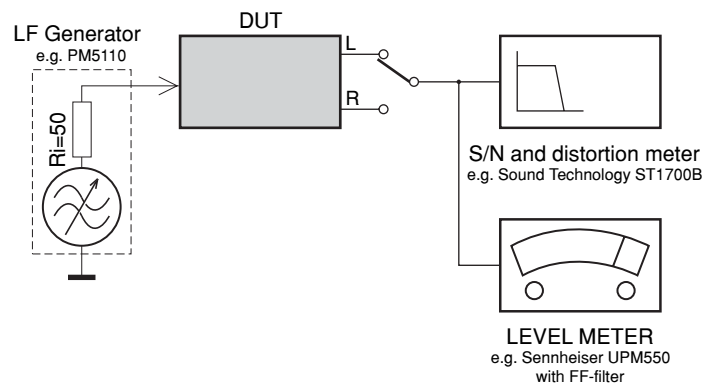
CD

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

Disc trays

PROGRAM indicator

REPEAT indicator

TUNING rotary

tunes to radio stations

OPEN/CLOSE

press to open/close the disc tray

DBB

turns the bass enhancement on/off

◀◀ / ▶▶

skips or searches CD tracks backwards/forwards

REPEAT

BAND (MW•FM•FM STEREO)

STOP ■

stops CD playback;

raises a CD program

Tape deck keys

RECORD .. starts recording

▶ starts playback

◀◀ / ▶▶ fast rewinds/winds a tape

■▲ stops playback;

..... opens the tape holder

|| interrupts playback or recording

⑫ Tape deck

⑬ FUNCTION: TUNER, TAPE, CD

– selects CD, tape or radio source of sound

⑭ PROGRAM

– programs tracks and reviews the program

⑮

– 3.5 mm headphone socket

Helpful hints:

– Adjust the volume to a moderate level before you plug in the headphones.

– Connecting headphones will switch off the speakers.

⑯ ▶ ||

– starts or pauses CD playback

⑰ DISC: 1 / 2 / 3

– selects a disc tray for playback

⑱ VOLUME ▲, ▼

– adjusts the volume level

⑲ POWER

– switches the system on or to standby mode.

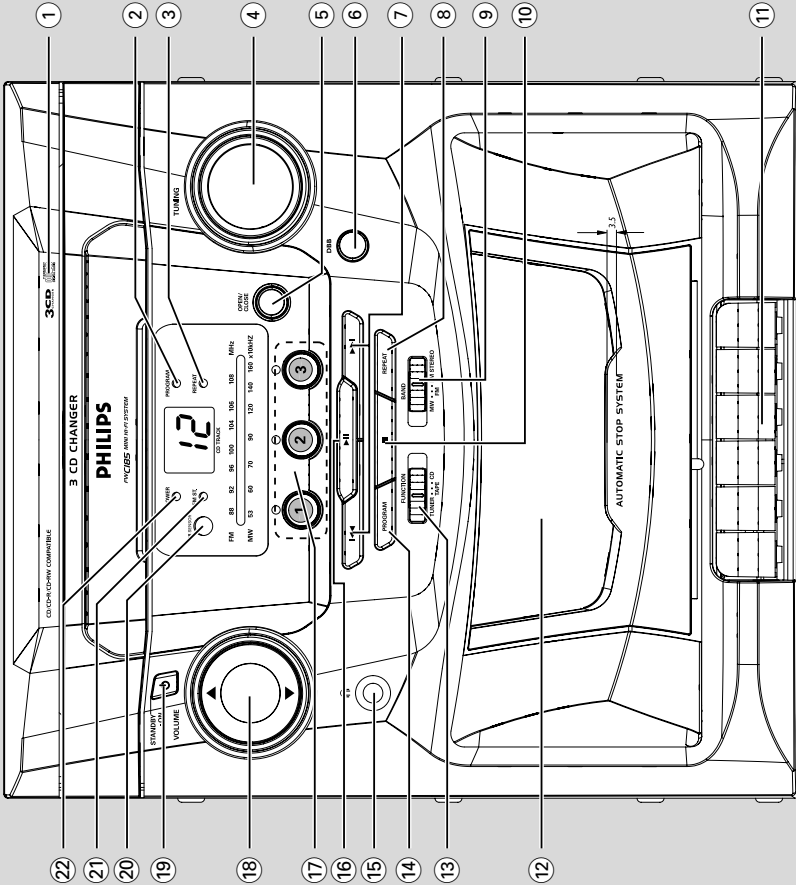
⑳ REMOTE SENSOR

– sensor for the infrared remote control

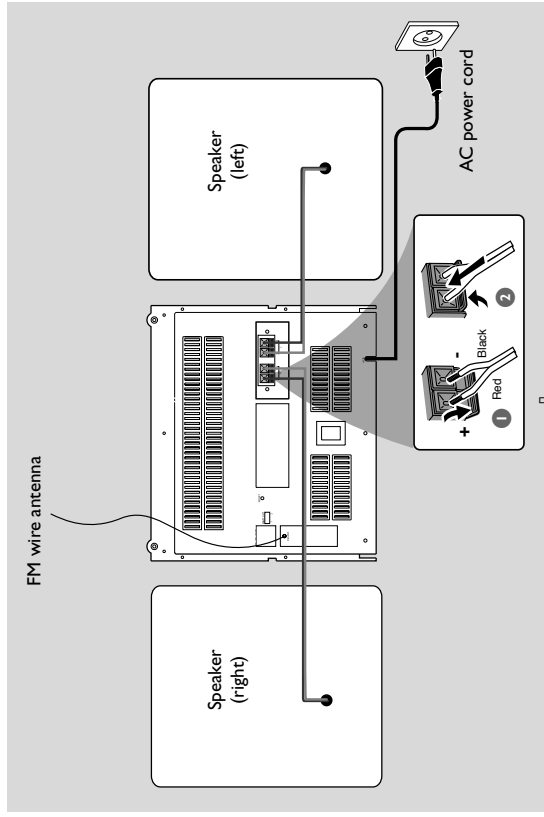
Helpful hints: Always point the remote control towards this sensor.

㉑ FM ST. indicator

㉒ Power indicator



Installation

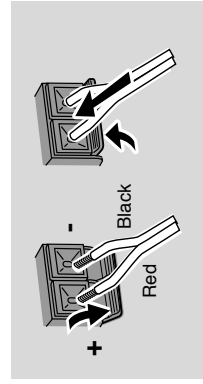


Rear connections

Warning:
Never make or change connections with the power supply switched on.

Speakers connection

Use the supplied speakers only. Using other speakers can damage the set or the sound quality will be negatively affected.
Connect the speaker wires to the SPEAKERS terminals, right speaker to "R", and left speaker to "L", red (labelled red) wire to "+" and black (labelled black) wire to "-".

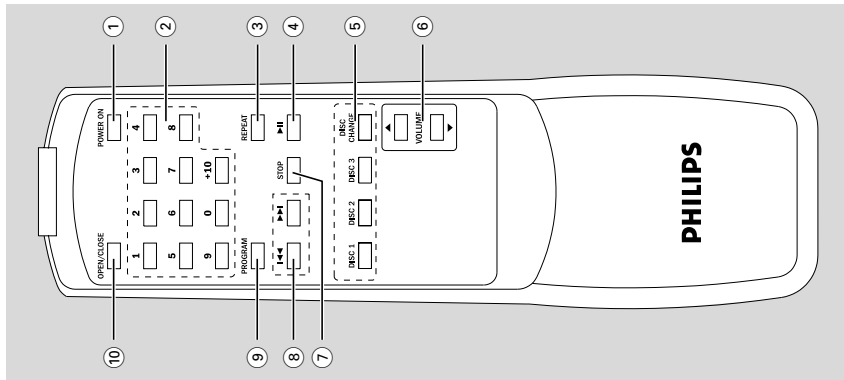


Press the clip of the red terminal and fully insert the stripped portion of the coloured (or marked) speaker cable into the socket, then

Controls

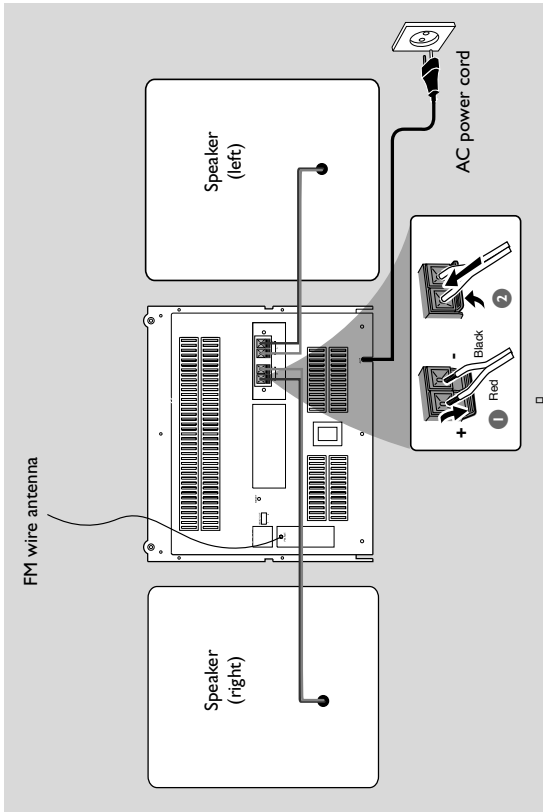
- 1 **POWER ON**
 - switches the system on or to standby mode
- 2 **DIGITS 0 - +10**
 - CD: selects a track number
- 3 **REPEAT**
 - selects repeat modes
- 4 **▶ II**
 - starts or pauses CD playback
- 5 **DISC**
 - selects a disc tray for playback
- 6 **DISC CHANGE**
 - changes disc trays
- 7 **VOLUME ▲ ▼**
 - adjusts the volume level
- 8 **STOP**
 - stops CD playback
- 9 **◀◀ / ▶▶**
 - erase a CD program
- 10 **PROGRAM**
 - skips or searches CD tracks backwards/forwards
- 11 **PROGRAM**
 - programs tracks and reviews the program
- 12 **OPEN/CLOSE**
 - press to open/closes the disc tray

Remote control



CONNECTION AND CONTROLS

Installation



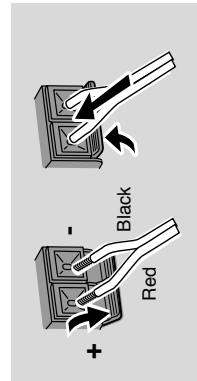
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Press the clip of the red terminal and fully insert the stripped portion of the coloured (or marked) speaker cable into the socket; then

Installation

Using AC power

Make sure all connections have been made before switching on the power supply.

Connect the power cable supplied to

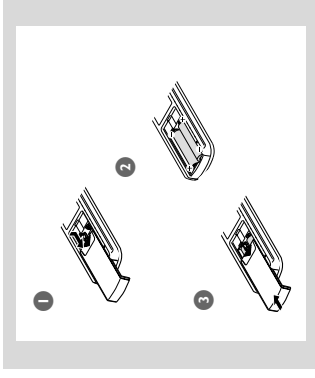
AC ~ and to the wall socket. This switches on the power supply.

When the system is switched to standby, it is still consuming some power. **To disconnect the system from the power supply completely, remove the power plug from the wall socket.**

The type plate is located on the rear of the set.

Inserting batteries into the remote control

Insert two batteries type R06 or AA 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 or will not be used for a long time.
- Do not use old and new or different types of batteries in combination.
- Batteries contain chemical substances, so they should be disposed off properly.

For more information on operation instruction please visit Philips Audio internet site : <http://www.audio.philips.com>

DISASSEMBLY DIAGRAMS

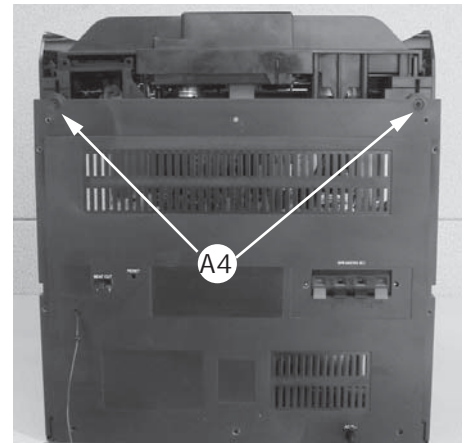
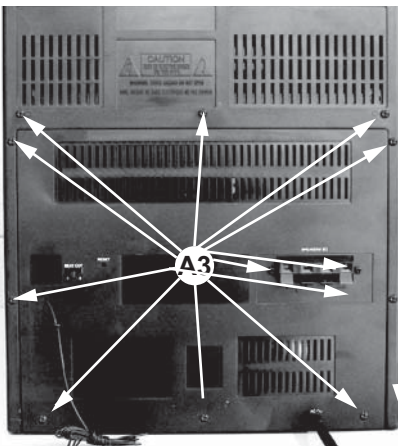
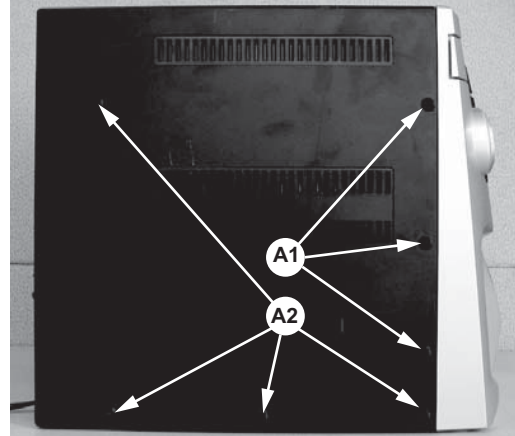
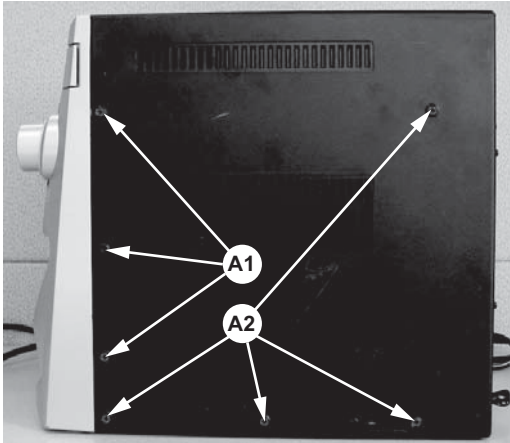
A. Remove top & rear cabinet

A1: Remove screws T3x10 (3pcs)

A2: Remove screws M3x12 (4pcs)

A3: Remove screws M3x10 (12pcs)

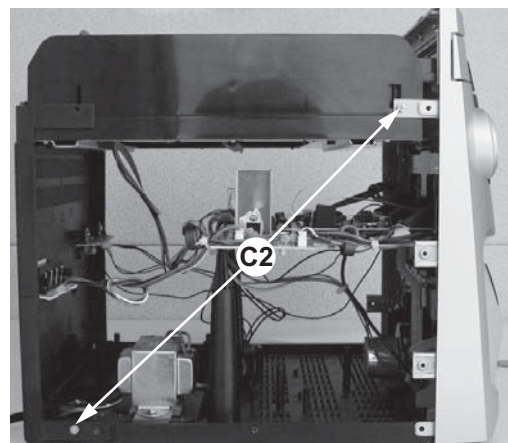
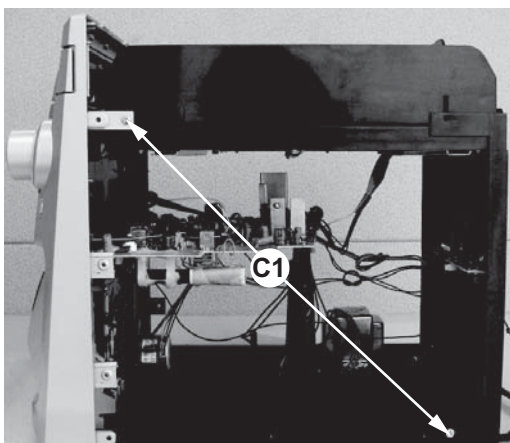
A4: Remove screws M3x16 (2pcs)



C. Remove left & right side screws

C1: Remove screws M3x12 & M3x10 (1pcs)

C1: Remove screws M3x12 & M3x10 (1pcs)



DISASSEMBLY DIAGRAMS

D1. Remove the CD Door



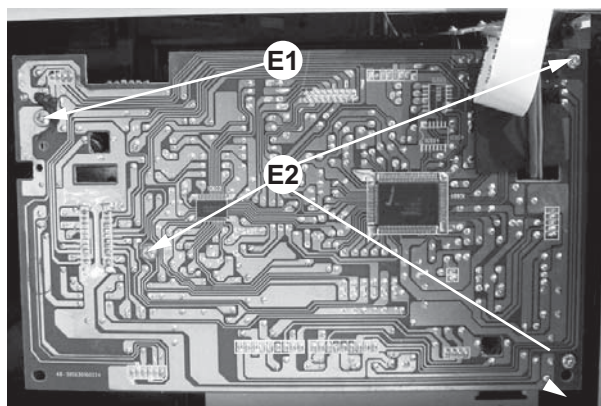
D2. Remove the front CD changer

D2: Remove screws M3x10 (2pcs)



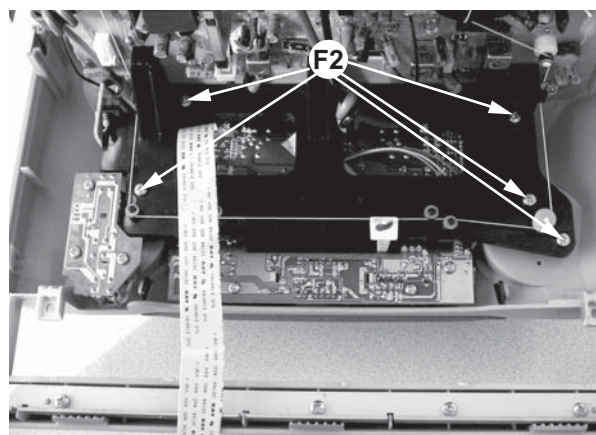
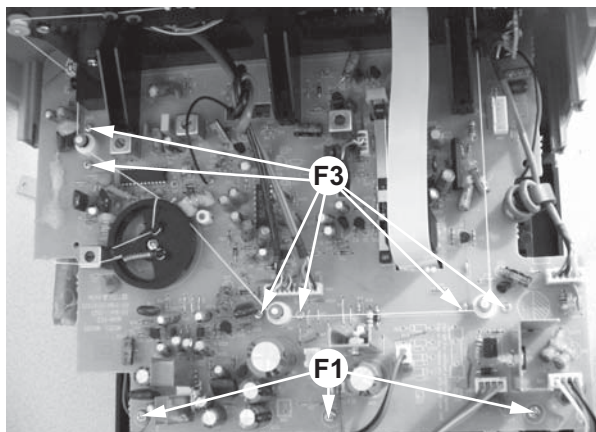
E. Remove the CD board

- E1: Remove screws T3x8 (1pcs)
 E2: Remove screws M3x10 (3pcs)



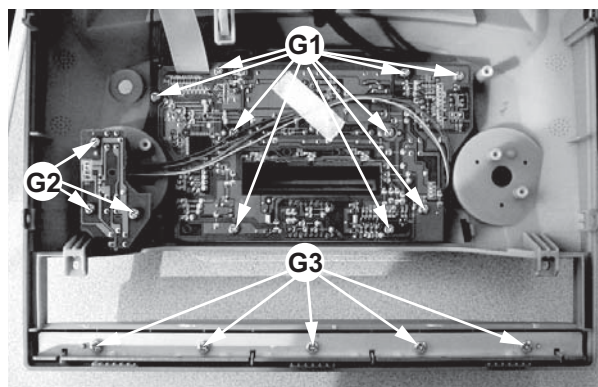
F. Remove the Main PCB and mounting bracket

- F1: Remove screws M3x12 (3pcs)
 F2: Remove screws M3x10 (5pcs)
 F3: Remove screws M3x10 (6pcs)



G. Remove the Display PCB, Volume PCB and metal plate

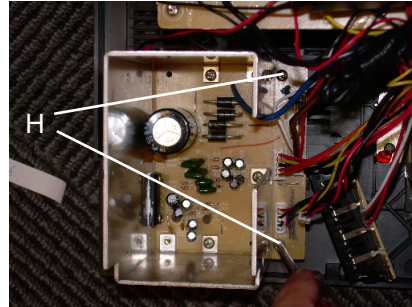
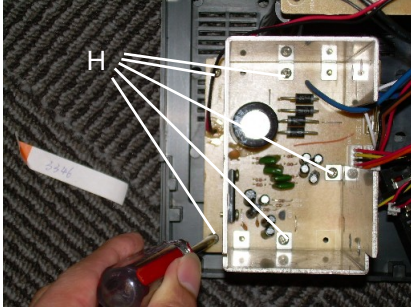
- G1: Remove screws M3x10 (9pcs)
 G2: Remove screws M3x10 (3pcs)
 G3: Remove screws M3x8 (5pcs)



DISASSEMBLY DIAGRAMS

H. Remove the Power board

Remove screws T3x10 (7pcs)



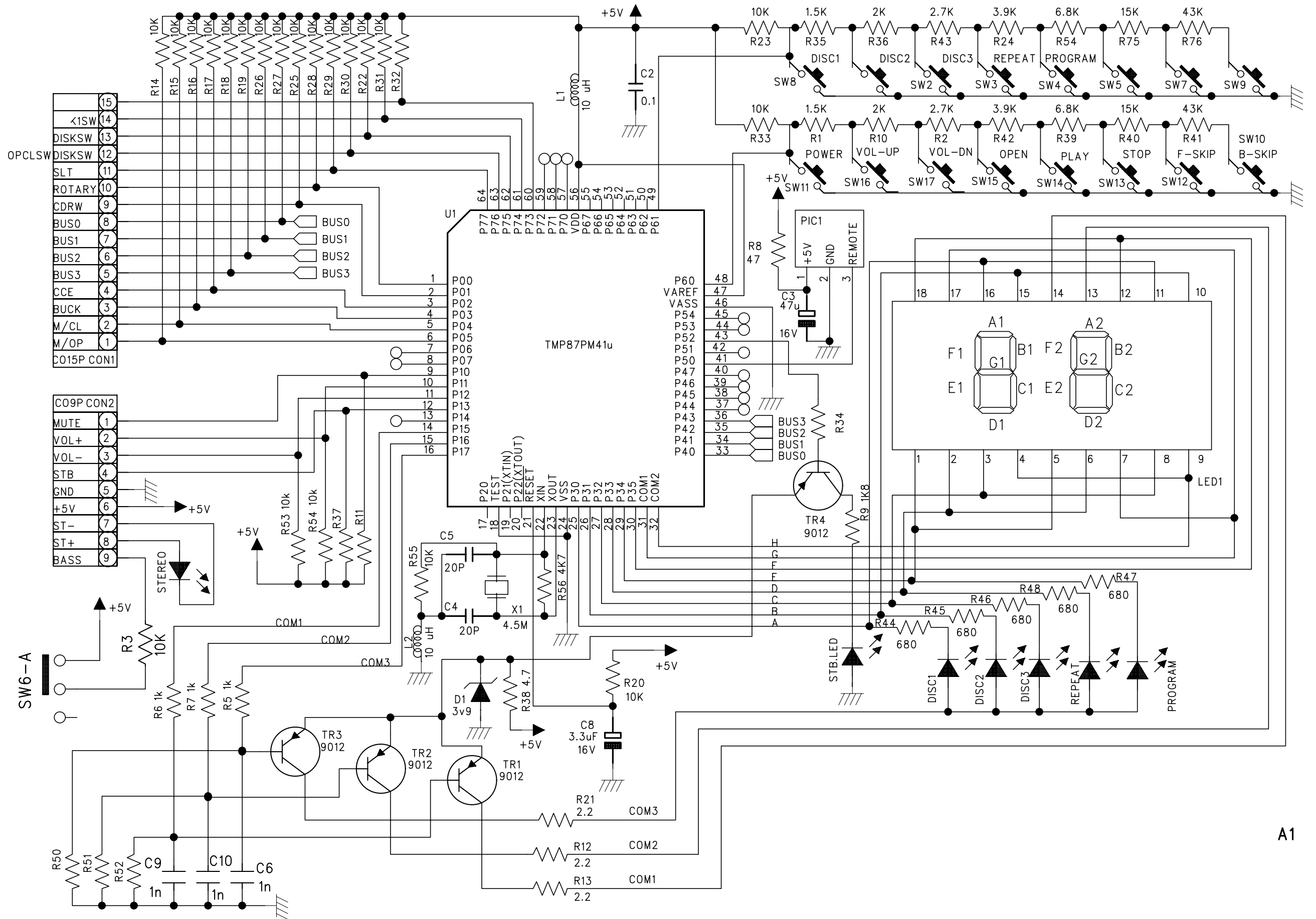
WIRING DIAGRAM

5 - 1

5 - 1

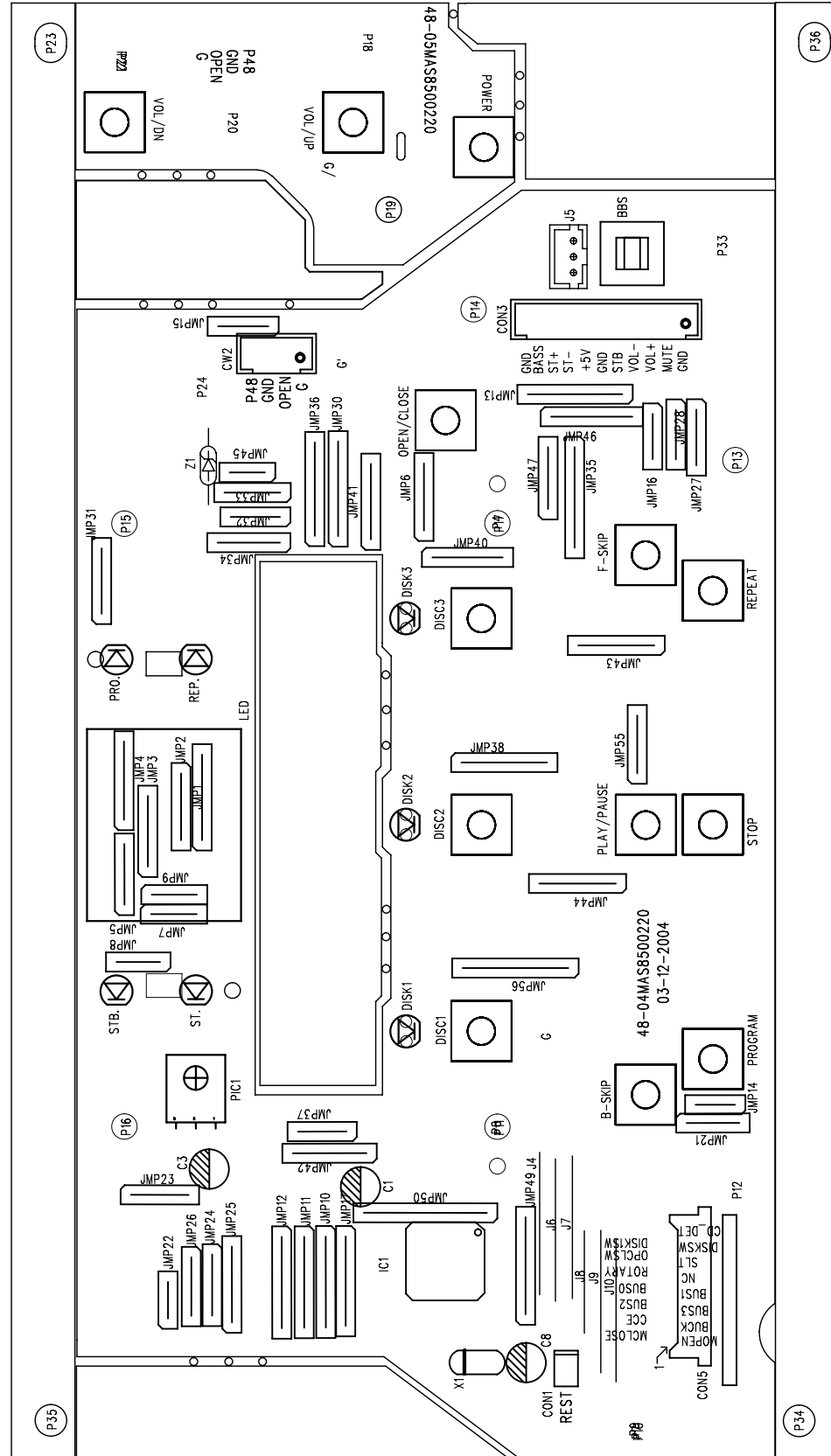
WIRING DIAGRAM



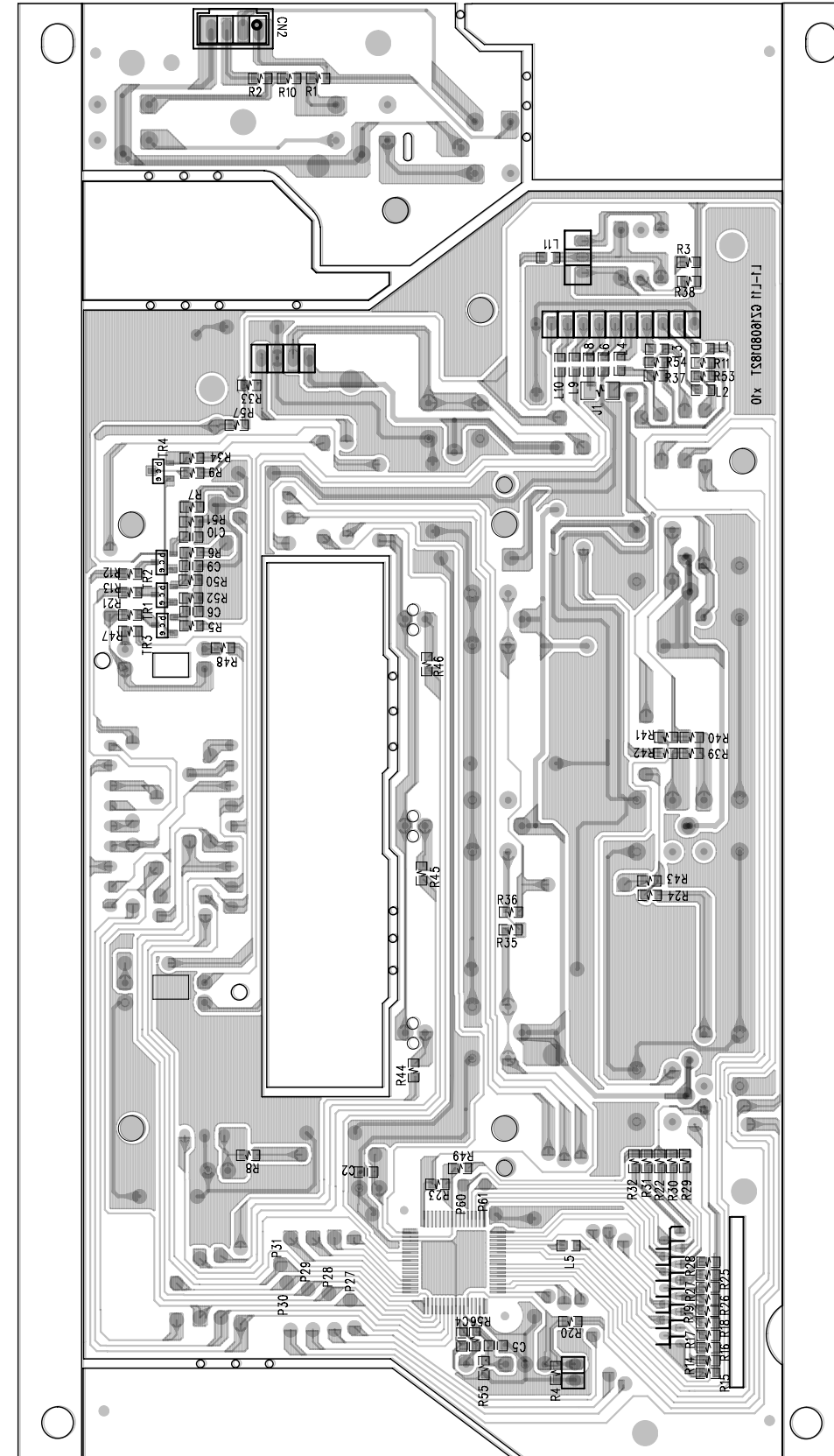


LAYOUT DIAGRAM - DISPLAY BOARD

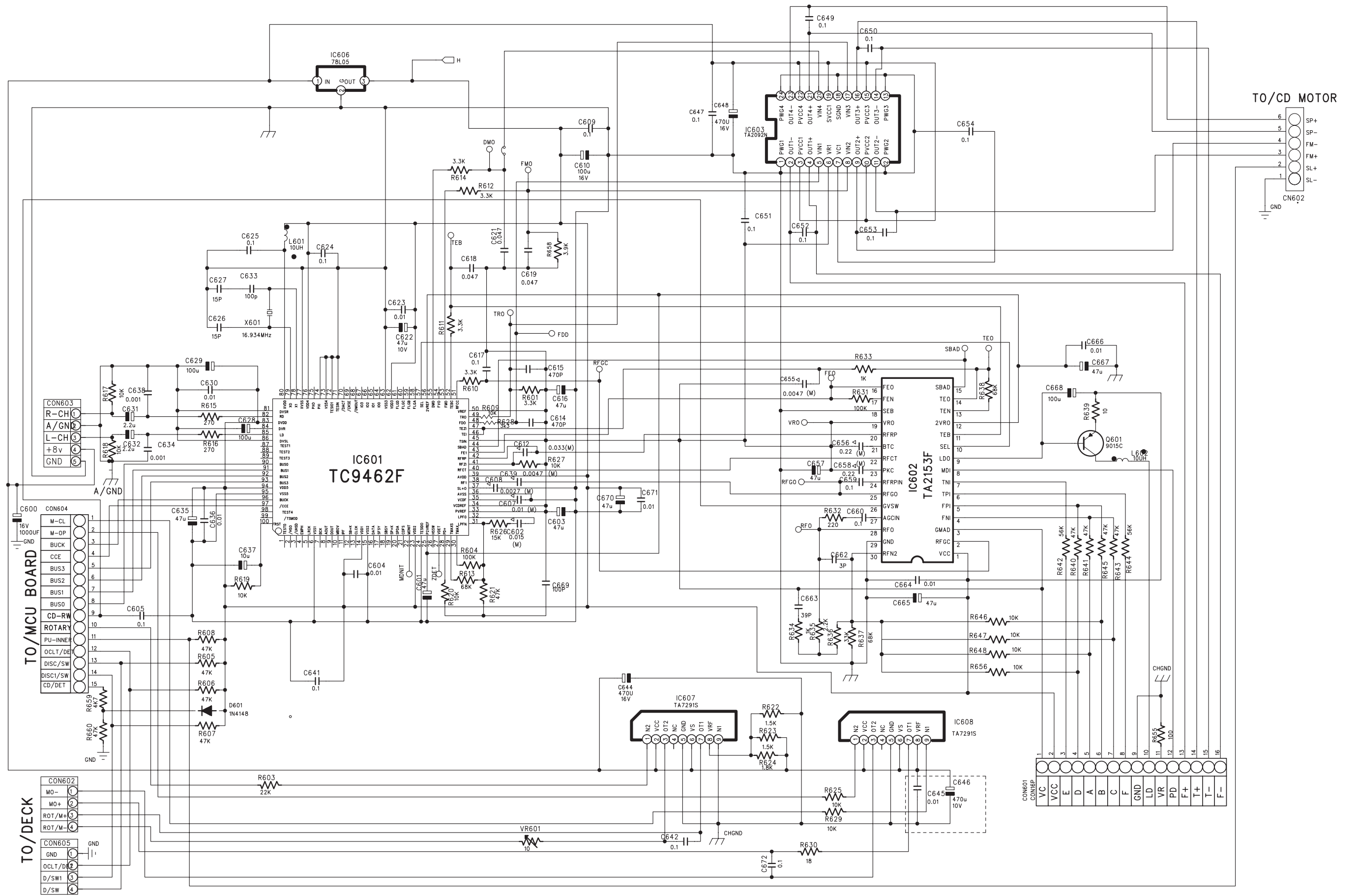
SIDE (A)



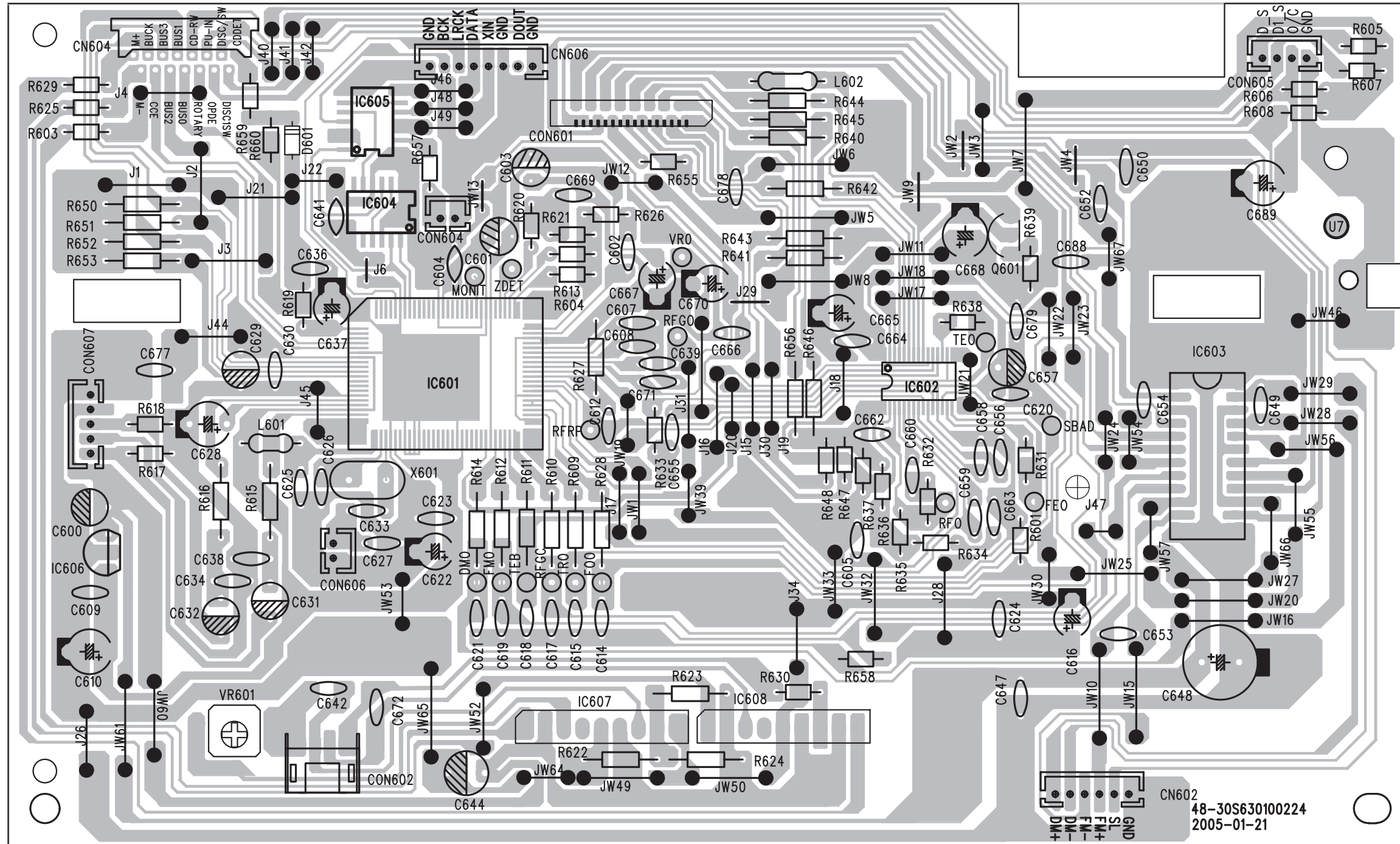
SIDE (B)



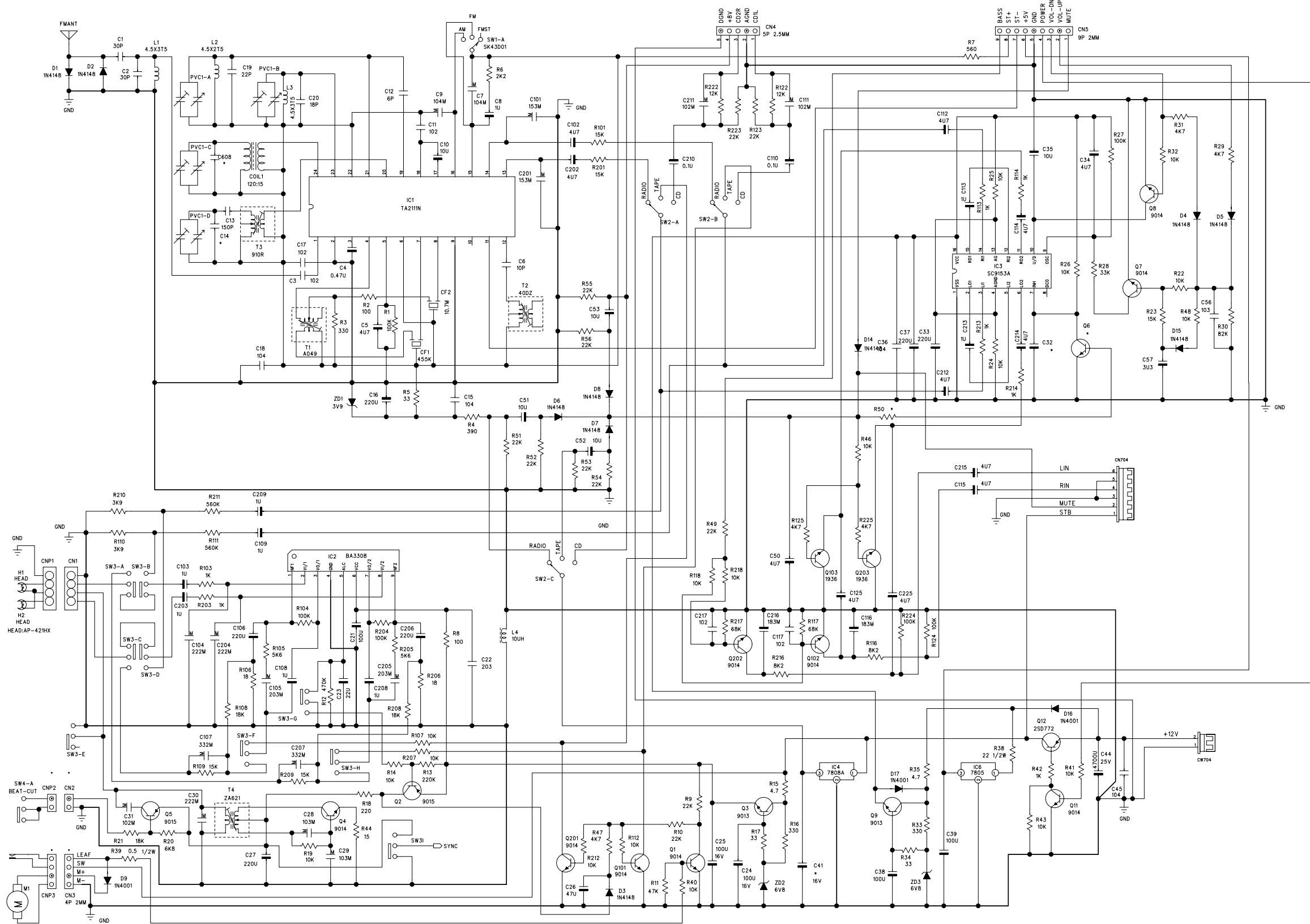
CIRCUIT DIAGRAM - CD BOARD



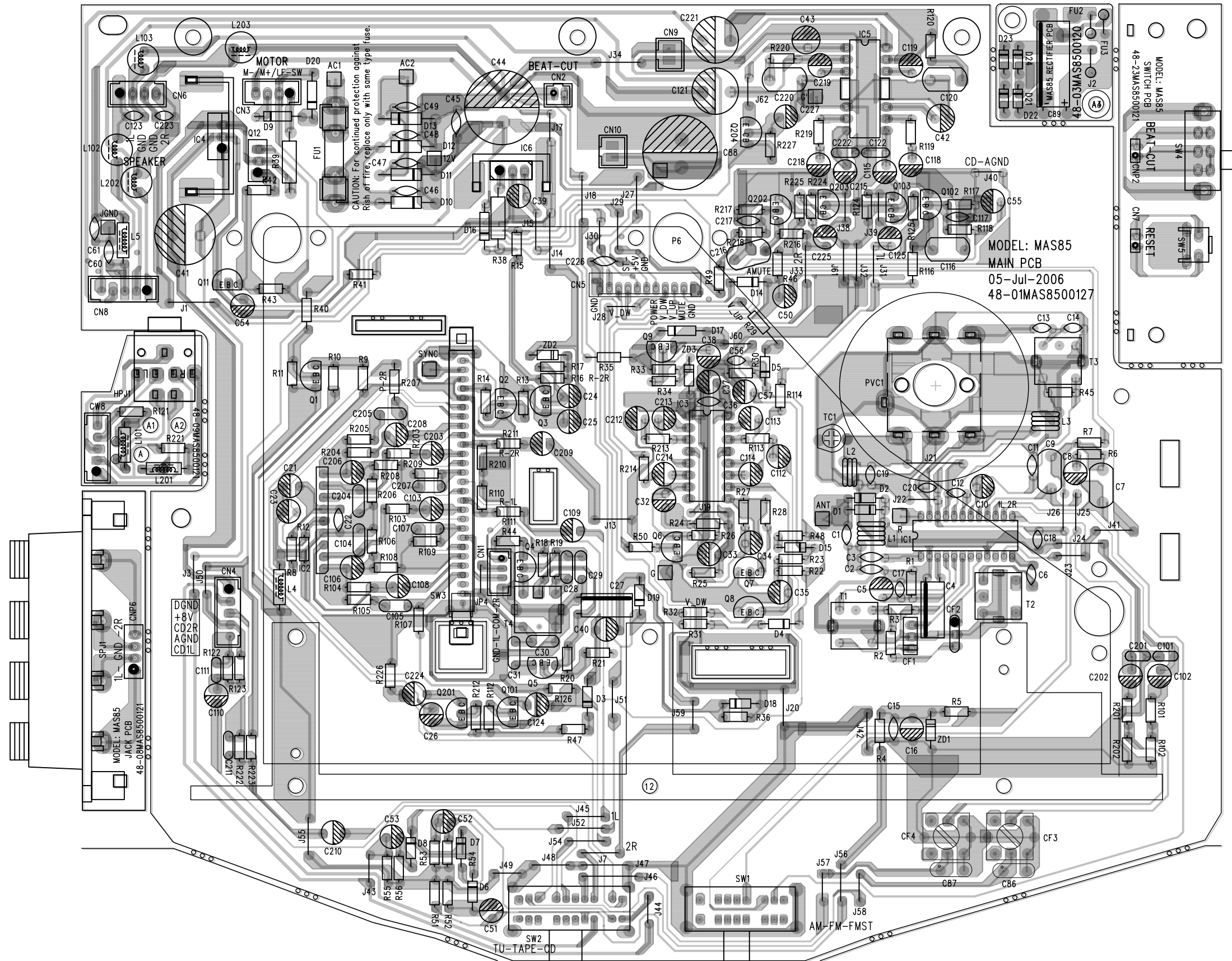
LAYOUT DIAGRAM - CD BOARD



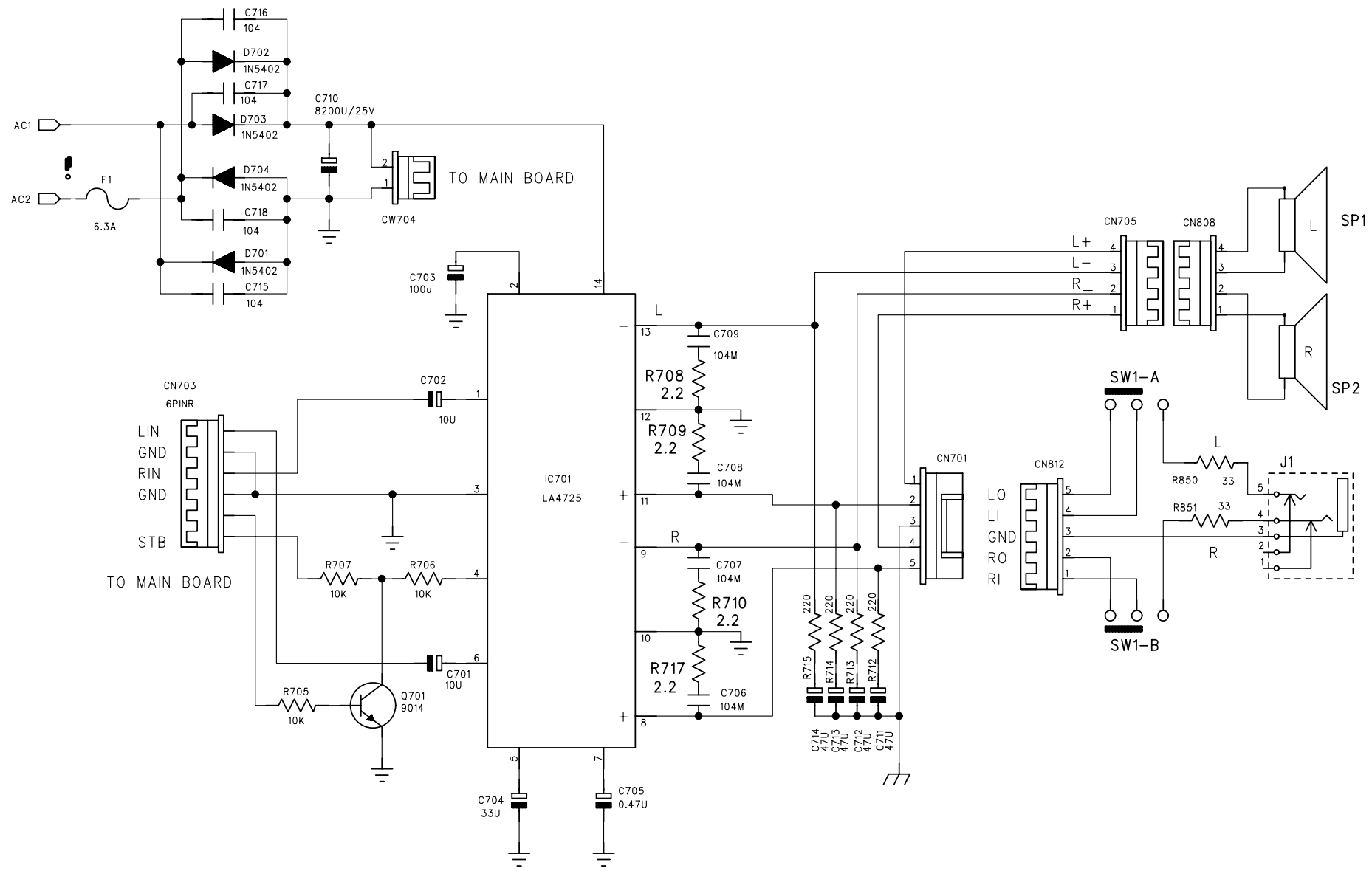
CIRCUIT DIAGRAM - MAIN BOARD



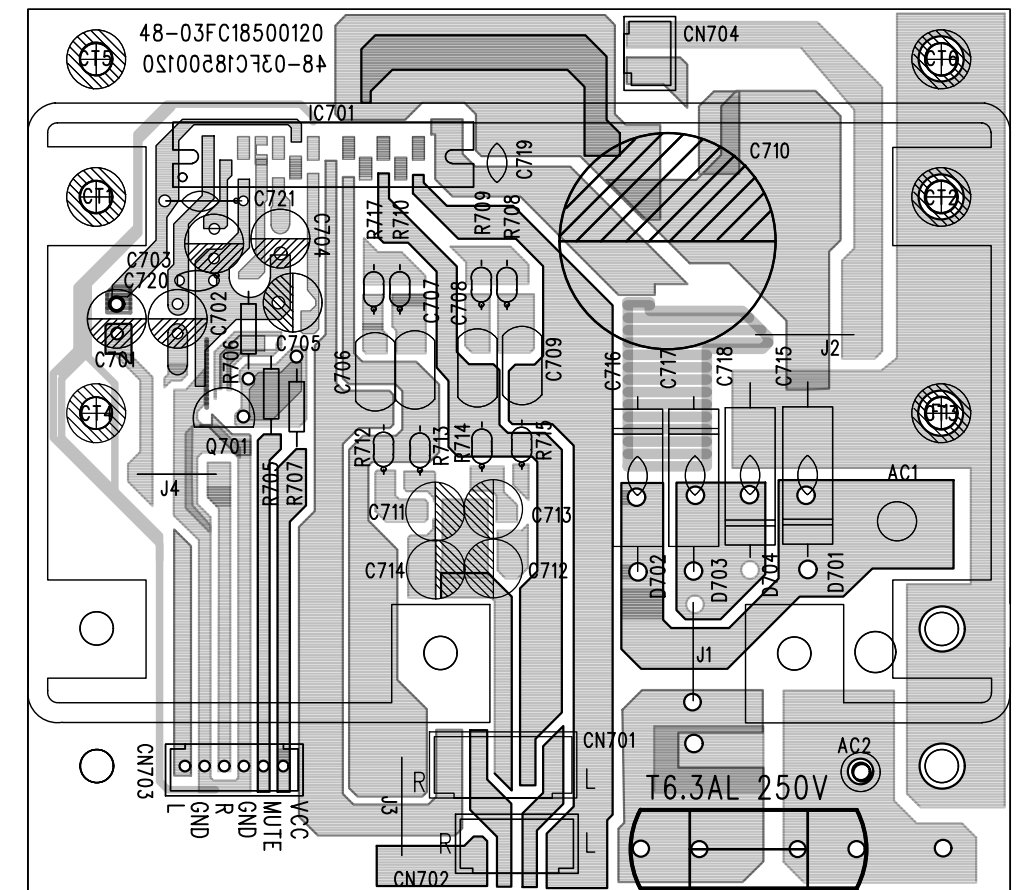
LAYOUT DIAGRAM - MAIN BOARD



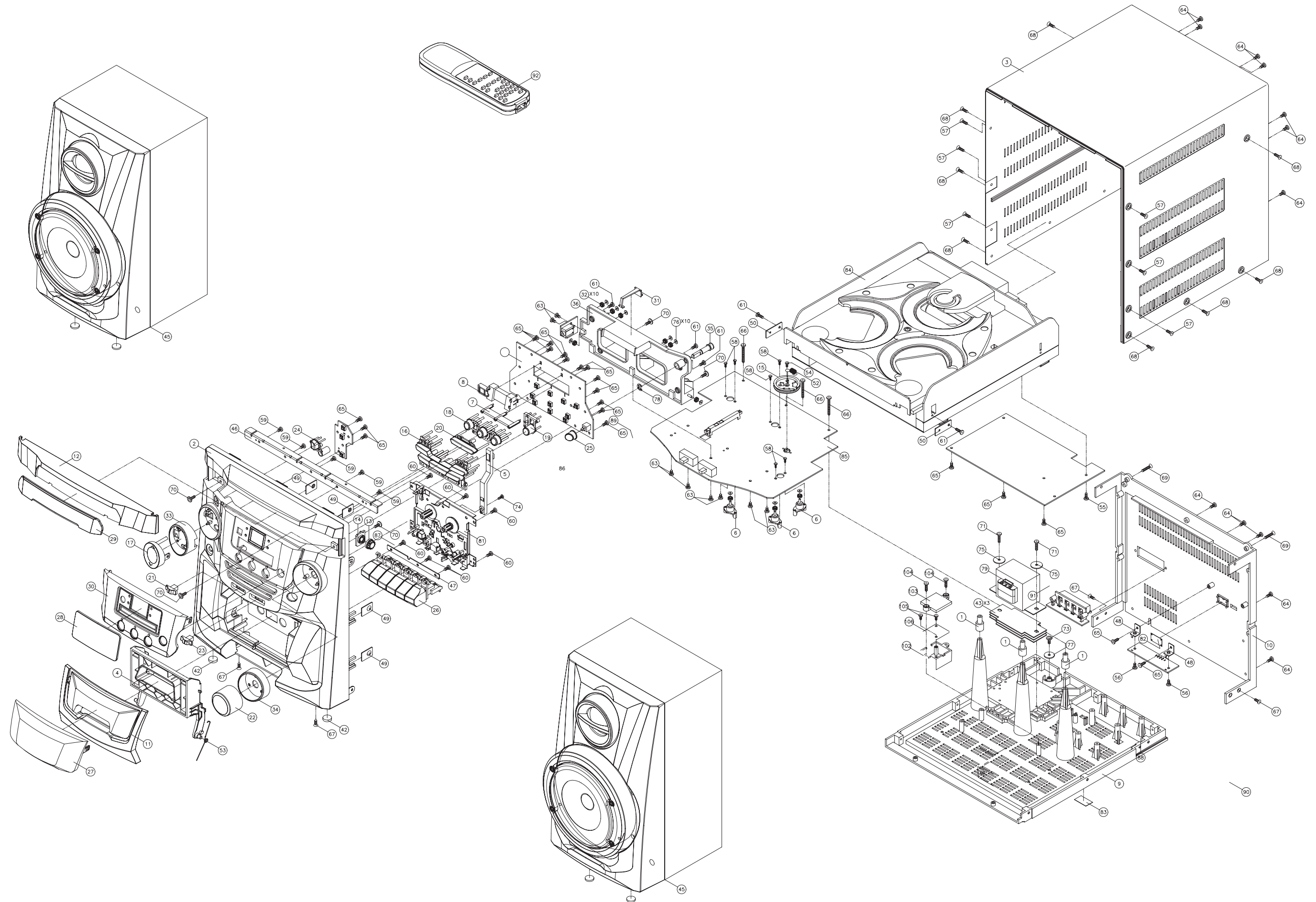
CIRCUIT DIAGRAM - POWER BOARD



LAYOUT DIAGRAM - POWER BOARD



EXPLODED VIEW DIAGRAM



ACCESSORIES PARTS LIST

9965 000 40329 REMOTE CTR ASS'Y "PHILIPS"
 9965 000 40330 SPK BOX ASS'Y "PHILIPS"

MECHANICAL PARTS LIST

2 9965 000 40337 FRONT CABINET 433C
 3 9965 000 40338 REAR CABINET
 4 9940 000 04106 CASS DOOR BRACKET
 5 9965 000 40339 RECORD BRACKET
 6 9940 000 04107 POINTER BKT

 9 9965 000 40340 BOTTOM CABINET
 10 9965 000 40341 REAR BOARD
 11 9965 000 40342 CASS DOOR SIL.433C
 12 9965 000 40343 CD DOOR SIL.433C
 13 9940 000 04113 GEAR-1

 14 9940 000 04114 GEAR BRACKET
 15 9940 000 04115 DIAL DRUM
 16 9965 000 40344 PRO/STOP/REP.KNOB SIL.433C
 17 9965 000 40345 UP/DN-VOL KNOB
 18 9965 000 40346 DISC SELECT KNOB SIL.433C

 19 9965 000 40347 OPEN/CLOSE KNOB (931070B)
 20 9965 000 40348 PLAY KNOB 3KEYSSIL.433C
 21 9965 000 40349 FUNC. KNOB (931070B)
 22 9965 000 40350 TUNING KNOB (931070B)
 23 9965 000 40351 BAND KNOB (931070B)

 24 9965 000 40352 POWER KNOB 032C
 25 9965 000 40353 BASS KNOB (931070B)
 26 9965 000 40354 CASS KNOB (931070B)
 27 9940 000 04128 CASS DOOR LENS SAN
 28 9965 000 40355 DISPLAY LENS (PMMA)

 29 9965 000 40356 CD DOOR LENS (SAN) "PHILIPS"
 30 9965 000 40357 FRONT LENS (SAN)
 31 9940 000 04133 POINTER
 32 9940 000 04134 PULLEY
 33 9940 000 04135 VOL KNOB DECORATION RING

 34 9940 000 04136 TUN. KNOB DECORATION RING
 35 9940 000 04137 TUNING SHAFT
 36 9940 000 04138 DIAL BRACKET
 42 9965 000 40358 RUBBER FOOT DIA 15MM T=2MM
 53 9940 000 04103 CASS DOOR SPRING (SMALL)

 81 9965 000 40333 F/CASS DECK ASS'Y
 84 9965 000 40332 3DISC MECH ASS'Y (DA11V CD)

MISCELLANEOUS

9940 000 04169 16P FLAT FLEX CABLE P1 L=65
 9940 000 04171 15P FLAT FLEX CABLE P1 L=380
 9965 000 40331 CD BD ASS'Y
 9965 000 40334 TRASFO. EI66 240V HF-S66A79TM
 9965 000 40335 FERRITE CORE 16X12MM H=8MM

 9965 000 40336 Δ AC CORD VDE APP 2M (M.T) (BLK)/(98)
 9940 000 00593 Δ AC CORD SAA APP 2M (/79)

ELECTRICAL PARTS LIST - MAIN BOARD

CF1	9965 000 40359	CERAMIC FILTER LTP465Y
CF2	9940 000 03642	CER. FILTER LT10.7MA5-A RED
IC1	9940 000 02694	IC, TA2111N AM/FM TUNER
IC2	9940 000 03635	IC PRE AMP BA3308
IC3	9940 000 04146	IC SC9153A
L1	9940 000 03655	FM COIL 4.5X3.5T
L2	9965 000 40360	FM COIL 5X2.5T (0.8MM)
L3	9940 000 03655	FM COIL 4.5X3.5T
PVC1	9940 000 04147	P.V.C #T443DF-1DF44Q-JE(A/F)
Q103	9940 000 04337	TRANSISTORS 2SD1936T-AC
Q12	9940 000 04145	TRANSISTORS B772Y (160-320)
Q203	9940 000 04337	TRANSISTORS 2SD1936T-AC
SW1	9940 000 04152	SWITCH SK-43D01-M11
SW2	9940 000 04153	SWITCH SK-43D02-M11
SW3	9940 000 04151	PUSH SWITCH RSD-92D02N-ES
T2	9940 000 04148	I.F.T 10MM 740 (ORANGE)
T3	9940 000 03649	I.F.T 10MM 910 (RED)
T4	9940 000 03648	I.F.T 10MM 621 (BLACK)
TC1	9940 000 00254	TRIMMER 10PF 6MM (WH)
	9940 000 03645	FERRITE BAR D10X80MM
	9940 000 04149	AM COIL (AD)/M3 115:20T

ELECTRICAL PARTS LIST - POWER BOARD

C710	△ 9965 000 40361	E.CAP 8200UF 25V 20% -10%
D701	△ 9965 000 40362	RECTIFIER DIODE 1N5402 3A 200V
D702	△ 9965 000 40362	RECTIFIER DIODE 1N5402 3A 200V
D703	△ 9965 000 40362	RECTIFIER DIODE 1N5402 3A 200V
D704	△ 9965 000 40362	RECTIFIER DIODE 1N5402 3A 200V
IC701	9965 000 40363	IC (SANYO) LA4725
	△ 9965 000 40364	GL FUSE 5X20MM T6.3A/250V S506

ELECTRICAL PARTS LIST - DISPLAY BOARD

BBS	9940 000 04158	PUSH SWITCH PS-22E08L (W/LOCK)
B-SKIP	9940 000 04157	TACT SWITCH 6X6MM H=5MM 5LEGS
F-SKIP	9940 000 04157	TACT SWITCH 6X6MM H=5MM 5LEGS
IC1	9940 000 04156	IC TMP87CK41U-5NA2(JZ)
LED	9940 000 04155	LED DISPLAY FD-R4516T-P18-L

OP/CL 9940 000 04157 TACT SWITCH 6X6MM H=5MM 5LEGS
 PIC1 9940 000 00325 OPTIC SENSER (OPTO..)
 PLAY 9940 000 04157 TACT SWITCH 6X6MM H=5MM 5LEGS
 PRO 9940 000 00265 LED LAMP (MICRO)
 PROG 9940 000 04157 TACT SWITCH 6X6MM H=5MM 5LEGS

 REP 9940 000 00265 LED LAMP (MICRO)
 REPEAT 9940 000 04157 TACT SWITCH 6X6MM H=5MM 5LEGS
 ST 9940 000 00265 LED LAMP (MICRO)
 STB 9940 000 00265 LED LAMP (MICRO)
 STOP 9940 000 04157 TACT SWITCH 6X6MM H=5MM 5LEGS

 X1 9965 000 40365 CRYSTAL 8MHZ HC-49/US -30PPM
 9940 000 00265 LED LAMP (MICRO)
 9940 000 04157 TACT SWITCH 6X6MM H=5MM 5LEGS

ELECTRICAL PARTS LIST - KEY BOARD

POWER 9940 000 04157 TACT SWITCH 6X6MM H=5MM 5LEGS
 VOL DN 9940 000 04157 TACT SWITCH 6X6MM H=5MM 5LEGS
 VOL UP 9940 000 04157 TACT SWITCH 6X6MM H=5MM 5LEGS

ELECTRICAL PARTS LIST - JACK BOARD

9940 000 04165 SPEAKER JACK

ELECTRICAL PARTS LIST - HEADPHONE BOARD

HPJ1 9940 000 03659 PHONE JACK TC-38-105-02-PT

ELECTRICAL PARTS LIST - SWITCH BOARD

SW4 9940 000 04166 SWITCH SKE-22F10-G10-NS
 SW5 9940 000 04167 V/TACT SWITCH 7X7.4MM 3.85MM

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