

Service
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MC235B/05/12/37/79, MC235/37/79

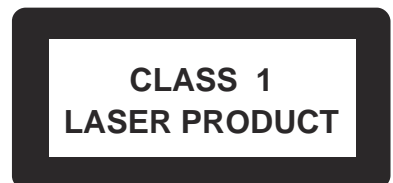


Service Manual



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Published by SL 0829 Service Audio Printed in The Netherlands Subject to modification



3141 785 30025

Version 1.5



PHILIPS

SPECIFICATIONS**GENERAL:**

Mains voltage : 120/240V \pm 15% Switchable for /21
 120V \pm 10% for /37
 230V \pm 10% for /22/25
 240V \pm 10% for /30

Mains frequency: 50/60Hz

Clock accuracy : < 4 seconds per day

Dimension centre unit : 250 x 245 x 96 (mm)

Power consumption

Active : 15W for /21/22/25/37/30

Standby : < 6W (DEMO mode off)

ECO Power Standby : < 1W for /22/25

TUNER:**FM**

Tuning range : 87.5-108MHz

Grid : 50kHz
 100kHz for /21/37

IF frequency : 10.7MHz \pm 20kHz

Aerial input : 75 Ω coaxial
 300 Ω for /37

Sensitivity at 26dB S/N : < 22dBf

Selectivity at 300kHz bandwidth : > 33dB

Image rejection : > 20dB [> 25dB]

Distortion at RF=1mV, dev. 75kHz : < 3%

-3dB Limiting point : < 23.5dB

Crosstalk at RF=1mV, dev. 40kHz : > 26dB

MW

Tuning range : 531-1602kHz
 530-1700kHz for /21/37

Grid : 9kHz
 10kHz for /21/37

IF frequency : 450kHz \pm 1kHz

Aerial input : Frame aerial 18.1 μ H

Sensitivity at 26dB S/N : < 4.0mV/M
 [> 3.25mV/M]

Selectivity at 300kHz bandwidth : > 20dB

IF rejection : > 24dB

Image rejection : > 20dB [> 28 dB]

Distortion at RF=50mV, M=80% : < 5%

AMPLIFIER:**Output power**

L & R : 2 x 5W FTC (4 Ω , 1kHz, 10% THD)

Frequency response within -3dB : 60Hz-14kHz

Digital Sound Control (DSC) : Jazz / Rock / Pop / Classic

Dynamic Bass Boost (DBB) : Jazz / Rock / Pop / Classic

Input sensitivity

Aux in (at 1kHz) : 500mV at 600 Ω

Output sensitivity

Headphone output at 32 ohm : 15mW \pm 2dB (Max. vol.)

COMPACT DISC:

Frequency response within \pm 3dB : 63Hz - 14kHz

Output level (in Vrms) : 500mV, $Z_{out} = 100\Omega$

Signal/Noise ratio (A-weighted): > 67dBA

Distortion at 1kHz : < 0.02%

Channel unbalance at 1kHz : < \pm 2dB

Channel separation at 1kHz : > 30dB

Emphasis : 15/50 μ S (switched
 automatically by CD10)

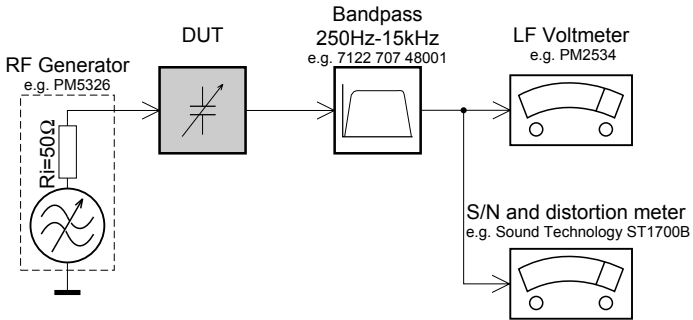
THD Noise(1kHz) : < 1.5%

Outband Attenuation : > 35dB

[...] Values indicated are for /22/25 only.

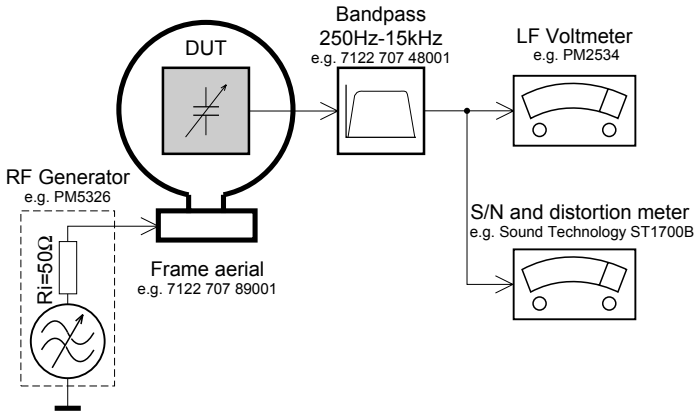
MEASUREMENT SETUP

Tuner FM



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

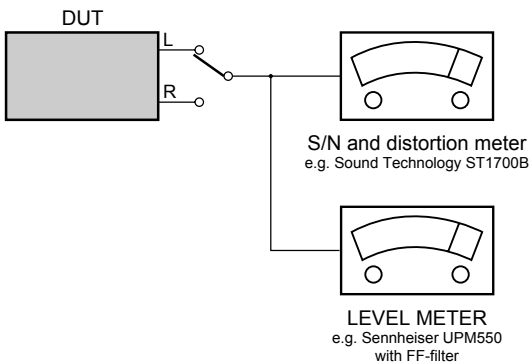
Tuner AM (MW,LW)



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

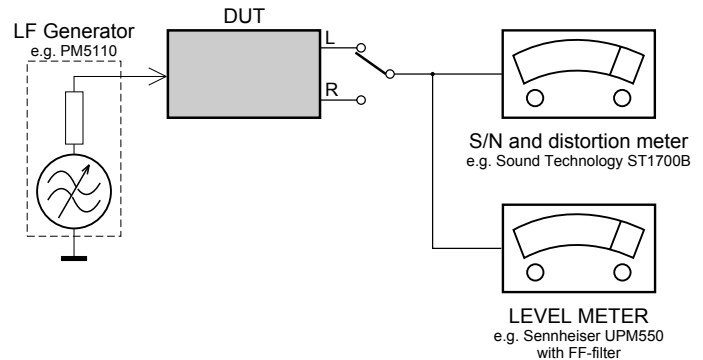
CD

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



Recorder

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



SERVICE AIDS

Service Tools:

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

Cassette:

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

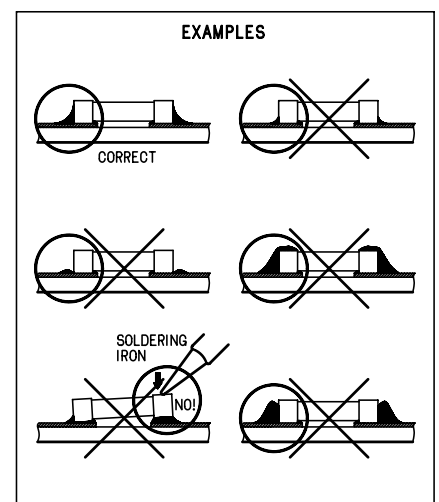
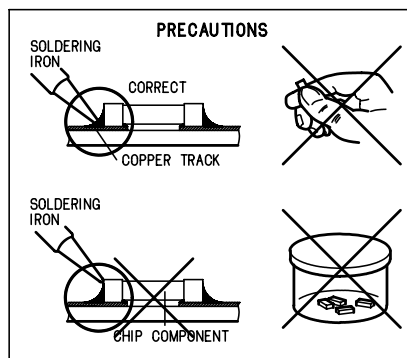
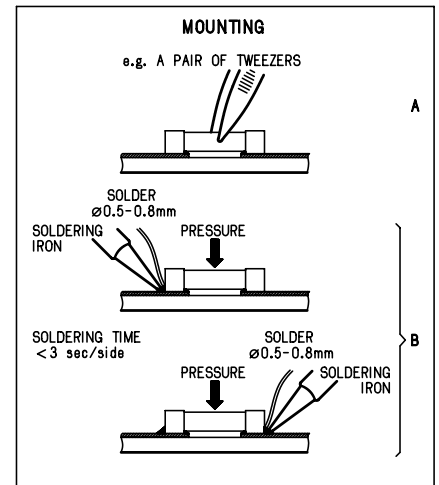
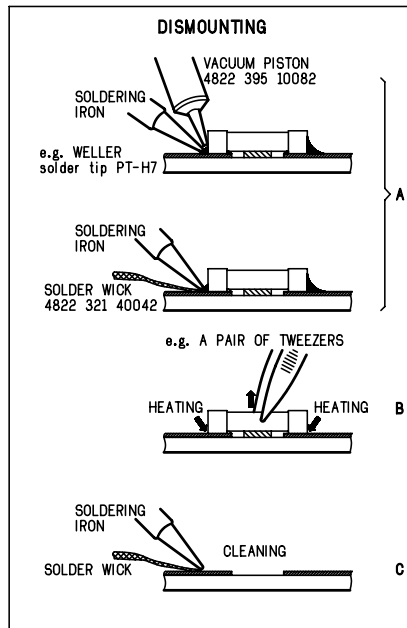
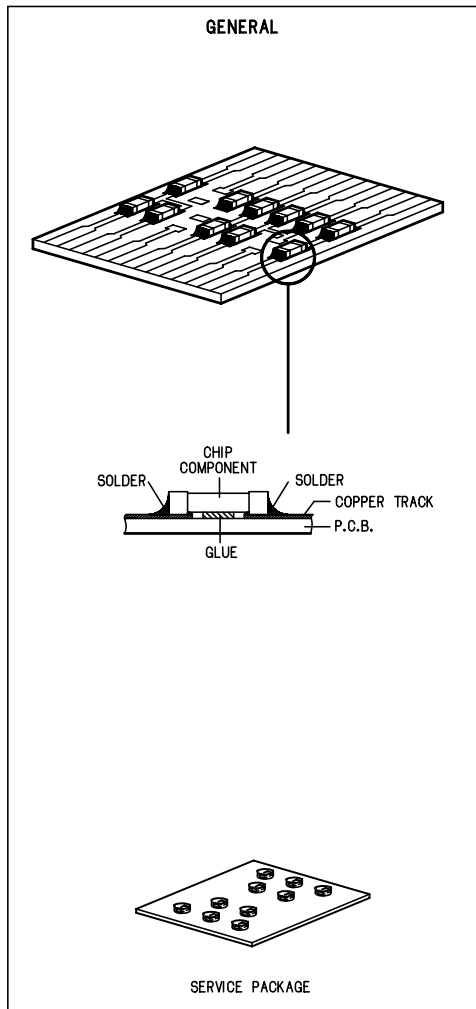
Compact Disc:

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

ESD Equipment:

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

HANDLING CHIP COMPONENTS



GB WARNING

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically.

When repairing, make sure that you are connected with the same potential as the mass of the set via a wrist wrap with resistance.

Keep components and tools also at this potential.

ESD**NL WAARSCHUWING**

Alle IC's en vele andere halfgeleiders zijn gevoelig voor electrostatische ontladingen (ESD).

Onzorgvuldig behandelen tijdens reparatie kan de levensduur drastisch doen verminderen. Zorg ervoor dat u tijdens reparatie via een polsband met weerstand verbonden bent met hetzelfde potentiaal als de massa van het apparaat.

Houd componenten en hulpmiddelen ook op ditzelfde potentiaal.

F ATTENTION

Tous les IC et beaucoup d'autres semi-conducteurs sont sensibles aux décharges statiques (ESD).

Leur longévité pourrait être considérablement écourtée par le fait qu'aucune précaution n'est prise à leur manipulation.

Lors de réparations, s'assurer de bien être relié au même potentiel que la masse de l'appareil et enfilez le braceleterti d'une résistance de sécurité.

Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

D WARNUNG

Alle ICs und viele andere Halbleiter sind empfindlich gegenüber elektrostatistischen Entladungen (ESD).

Unvorsichtige Behandlung im Reparaturfall kann die Lebensdauer drastisch reduzieren.

Veranlassen Sie, dass Sie im Reparaturfall über ein Pulsarmband mit Widerstand verbunden sind mit dem gleichen Potential wie die Masse des Gerätes.

Bauteile und Hilfsmittel auch auf dieses gleiche Potential halten.

I AVVERTIMENTO

Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).

La loro longevità potrebbe essere fortemente ridatta in caso di non osservazione della più grande cauzione alla loro manipolazione.

Durante le riparazioni occorre quindi essere collegato allo stesso potenziale che quello della massa dell'apparecchio tramite un braccialetto a resistenza.

Assicurarsi che i componenti e anche gli utensili con quali si lavora siano anche a questo potenziale.

GB

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

Safety components are marked by the symbol \triangle .

NL

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

De Veiligheidsonderdelen zijn aangeduid met het symbool \triangle

F

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

Les composants de sécurité sont marqués \triangle

D

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

Sicherheitsbauteile sind durch das Symbol \triangle markiert.

I

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

Componenti di sicurezza sono marcati con \triangle

GB

After servicing and before returning set to customer perform a leakage current measurement test from all exposed metal parts to earth ground to assure no shock hazard exist. The leakage current must not exceed 0.5mA.

**GB Warning !**

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

S Varning !

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

SF Varoitus !

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

DK Advarse !

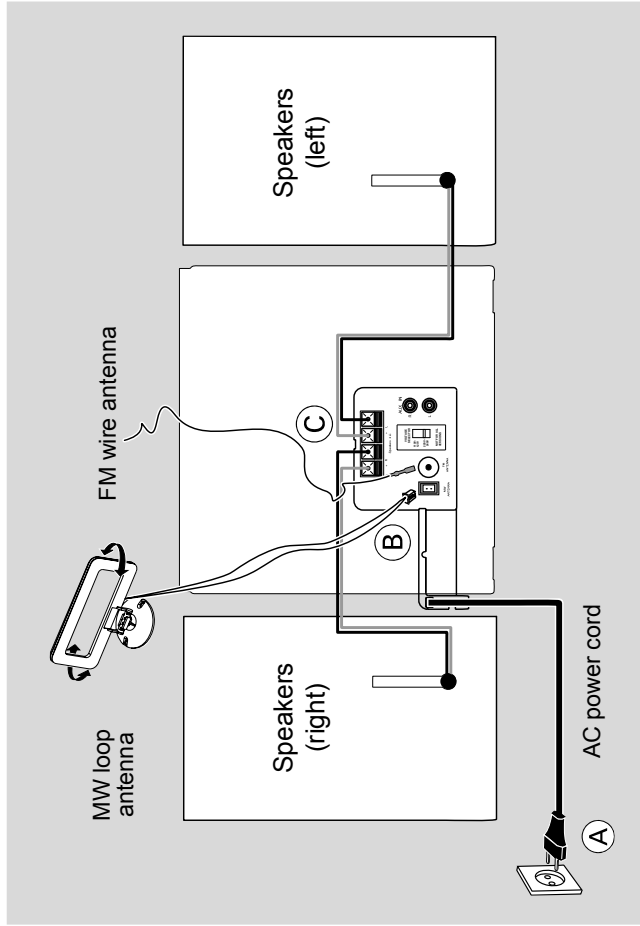
Usynlig laserstråling ved åbning når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

F

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

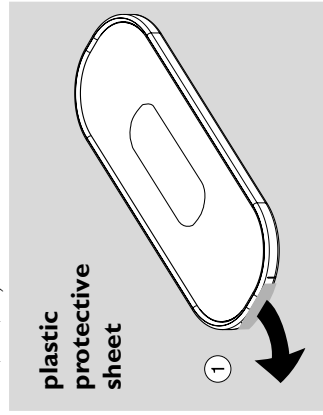
PREPARATIONS AND CONTROLS

Preparations



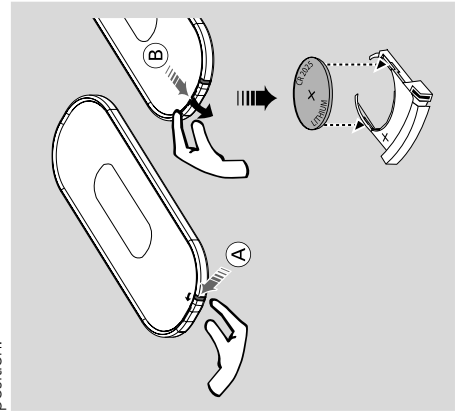
Preparations

- Before using the remote control**
- 1 Pull out the plastic protective sheet.
 - 2 Select the source you wish to control by pressing one of the source select keys on the remote control (for example CD, TUNER).
 - 3 Then select the desired function (for example ▶II, ◀I, ▶I).



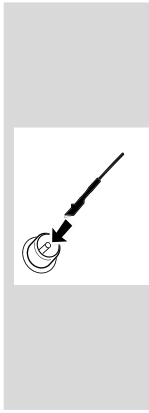
Replacing battery (lithium CR2025) into the remote control

- 1 Pull out the knob (A) slightly to the left.
- 2 Pull out the battery compartment (B).
- 3 Replace a new battery and fully insert the battery compartment back to the original position.



CAUTION!
Batteries contain chemical substances, so they should be disposed off properly.

FM Antenna

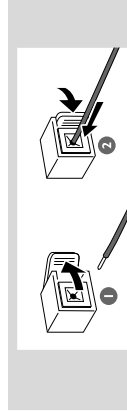


For better FM stereo reception, connect an outdoor FM antenna to the FM AERIAL (FM ANTENNA) terminal.

Speakers Connection

Front Speakers

Connect the speaker wires to the SPEAKERS terminals, right speaker to "RIGHT" and left speaker to "LEFT", colored (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.

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.

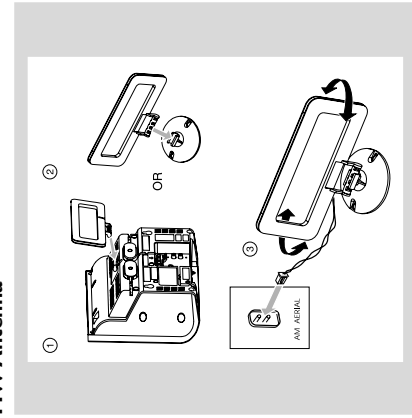
Note:

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

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.

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 any 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).

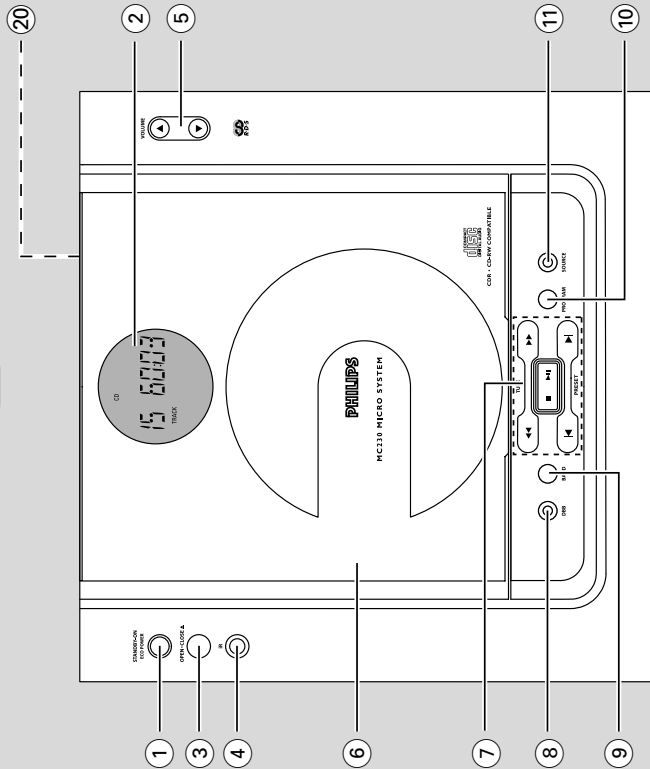
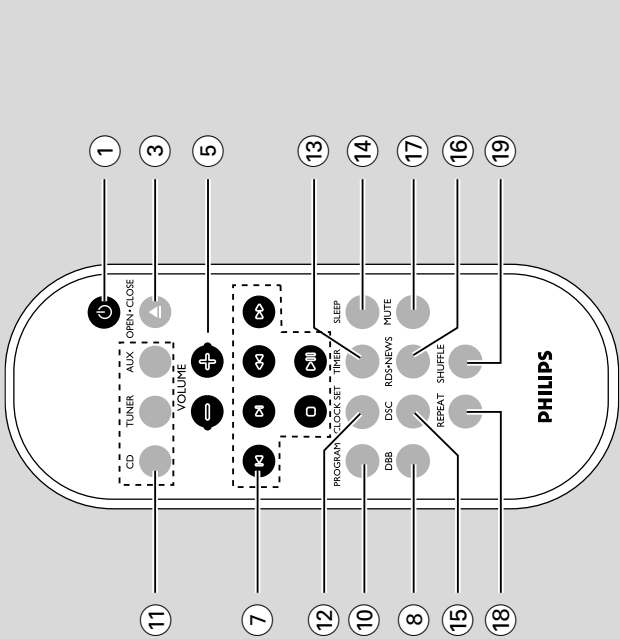
PREPARATIONS AND CONTROLS

Controls

Controls on the system and remote control

- 1 **STANDBY-ON/ ECO POWER** switches the system on or to Eco Power-standby.
- 2 **Display** shows the status of the system.
- 3 **OPEN • CLOSE ▲** opens/ closes the CD door.
- 4 **IR** remote sensor
- 5 **VOLUME (▲ / ▼) (+ / -)** adjusts the volume level.
- 6 **CD Door**
- 7 **Mode Selection**
- 8 **SEARCH/TUNE (◀ / ▶)** for TUNER tunes to a station for CD fast searches back and forward within a track/ CD.
- 9 **STOP ■** stops CD playback or erase a CD programme.
- 10 **PLAY ▶ II** starts or interrupts playback.
- 11 **PRESET (◀ / ▶)** for TUNER selects a preset radio station. for CD skips to the beginning of a current track/ previous/ subsequent track
- 12 **DBB (Dynamic Bass Boost)** enhances the bass.
- 13 **BAND** selects a waveband.
- 14 **PROGRAM** for CD programmes tracks and reviews the programme. for TUNER programmes tuner stations.
- 15 **SOURCE** selects the respective sound source for CD/ TUNER/ AUX.
- 16 **CLOCK SET** sets the clock function.
- 17 **TIMER** activates/ deactivates or sets the timer function
- 18 **SLEEP** activates/deactivates or selects the sleeper time.
- 19 **DSC (Digital Sound Control)** selects sound characteristics: ROCK/ JAZZ/ POP/ CLASSIC.
- 20 **RDS.NEWS** activates RDS news and Traffic Announcement. for tuner, displays RDS information.
- 21 **MUTE** interrupts and resumes sound reproduction.
- 22 **REPEAT** repeats a track/ CD programme/ entire CD.
- 23 **SHUFFLE** plays CD tracks in random order.
- 24 connects headphones

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 ▶ II, ◀, ▶).



PREPARATIONS AND CONTROLS

Important notes for users in the U.K.

Mains plug

This apparatus is fitted with an approved 13 Amp plug. To change a fuse in this type of plug proceed as follows:

- 1** Remove fuse cover and fuse.
- 2** Fix new fuse which should be a BS1362 5 Amp, A.S.T.A. or BSI approved type.
- 3** Refit the fuse cover.

If the fitted plug is not suitable for your socket outlets, it should be cut off and an appropriate plug fitted in its place.

If the mains plug contains a fuse, this should have a value of 5 Amp. If a plug without a fuse is used, the fuse at the distribution board should not be greater than 5 Amp.

Note: *The severed plug must be disposed of to avoid a possible shock hazard should it be inserted into a 13 Amp socket elsewhere.*

How to connect a plug

The wires in the mains lead are coloured with the following code: blue = neutral (N), brown = live (L).

- As these colours may not correspond with the colour markings identifying the terminals in your plug, proceed as follows:
 - Connect the blue wire to the terminal marked N or coloured black.
 - Connect the brown wire to the terminal marked L or coloured red.
 - Do not connect either wire to the earth terminal in the plug, marked E (or ⏏) or coloured green (or green and yellow).
- Before replacing the plug cover, make certain that the cord grip is clamped over the sheath of the lead - not simply over the two wires.

Copyright in the U.K.

Recording and playback of material may require consent. See Copyright Act 1956 and The Performer's Protection Acts 1958 to 1972.

Italia

DICHIARAZIONE DI CONFORMITA'

Si dichiara che l'apparecchio MC230, MC235 Philips risponde alle prescrizioni dell'art. 2 comma 1 del D.M. 28 Agosto 1995 n. 548.

Fatto a Eindhoven

Philips Consumer Electronics
Philips, Glaslaan 2
5616 JB Eindhoven, The Netherlands

Norge

Typeskilt finnes på apparatens underside.

Observer: Nettbryteren er sekundert innkoplet. Den innebygde nettdelen er derfor ikke frakoplet nettet så lenge apparatet er tilsluttet nettkontaktene.

For å redusere faren for brann eller elektrisk støt, skal apparatet ikke utsettes for regn eller fuktighet.

CAUTION

Use of controls or adjustments or performance of procedures other than herein may result in hazardous radiation exposure or other unsafe operation.

VAROITUS

Muiden kuin tässä esitettyjen toimintojen säädön tai asetusten muutto saattaa altistaa vaaralliselle säteilylle tai muille vaarallisille toiminnolle.

Troubleshooting

WARNING

Under no circumstances should you try to repair the system yourself, as this will invalidate the warranty. Do not open the system as there is a risk of electric shock.

If a fault occurs, first check the points listed below before taking the system for repair. If you are unable to remedy a problem by following these hints, consult your dealer or Philips for help.

Problem	Solution
CD OPERATION "NO DISC" is displayed.	<ul style="list-style-type: none"> - Insert a disc. - Check if the disc is inserted upside down. - Wait until the moisture condensation at the lens has cleared. - Replace or clean the disc, see "Maintenance". - Use a finalised CD-RW or CD-R.
RADIO RECEPTION Radio reception is poor.	<ul style="list-style-type: none"> - If the signal is too weak, adjust the antenna or connect an external antenna for better reception. - Increase the distance between the Micro HiFi System and your TV or VCR.
GENERAL The system does not react when buttons are pressed.	<ul style="list-style-type: none"> - Remove and reconnect the AC power plug and switch on the system again.
Sound cannot be heard or is of poor quality.	<ul style="list-style-type: none"> - Adjust the volume. - Disconnect the headphones. - Check that the speakers are connected correctly. - Check if the stripped speaker wire is clamped.
The left and right sound outputs are reversed.	<ul style="list-style-type: none"> - Check the speaker connections and location.
The remote control does not function properly.	<ul style="list-style-type: none"> - Select the source (CD or TUNER, for example) before pressing the function button (▶ , ◀, ▶). - Reduce the distance between the remote control and the system. - Insert the battery with its polarities (+/- signs) aligned as indicated. - Replace the battery. - Point the remote control directly toward IR sensor on the front of the system.
The timer is not working.	<ul style="list-style-type: none"> - Set the clock correctly. - Press TIMER to switch on the timer.
The Clock/Timer setting is erased.	<ul style="list-style-type: none"> - Power has been interrupted or the power cord has been disconnected. Reset the clock/timer.

DISMANTLING INSTRUCTIONS

Dismantling of the Rear Portion

- 1) Remove 11 screws A and B as indicated to remove the Rear Cabinet.
- 2) Remove 2 screws C as indicated to loosen the Speaker Wire Holder.
- 3) Remove 2 screws D as indicated to loosen the Speaker Board .
- 4) Remove 2 screws E as indicated to loosen the AUX IN jack.

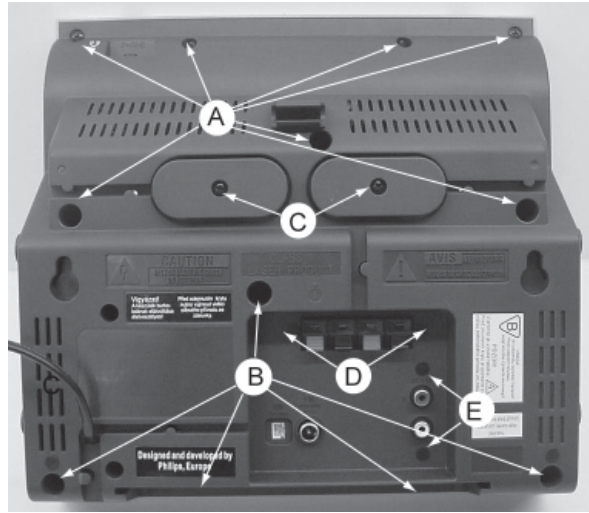


Figure 1

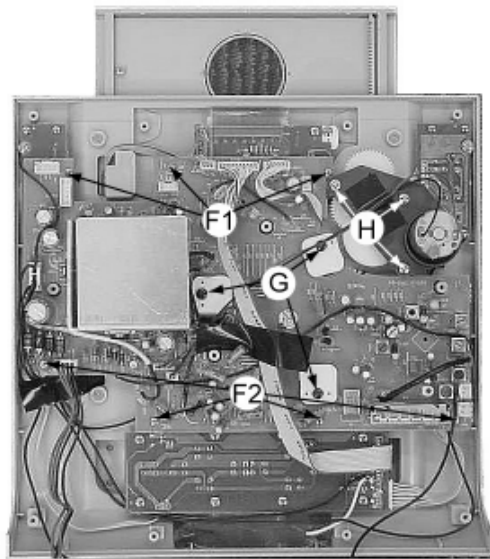


Figure 2

Dismantling of the Front Boards and CD Door

- 1) Loosen 3 screws G each to remove the CD Mechanism Holder Bracket.
- 2) Loosen 7 screws F1 and F2 as indicated to remove the Main Board.
- 3) Remove 3 screws H as indicated to loosen the Gear Motor Module.
- 4) Loosen 4 screws I (see Figure 3) to remove the Key_C Board.
- 5) Loosen 2 screws J (see Figure 3) to remove the Display Board.

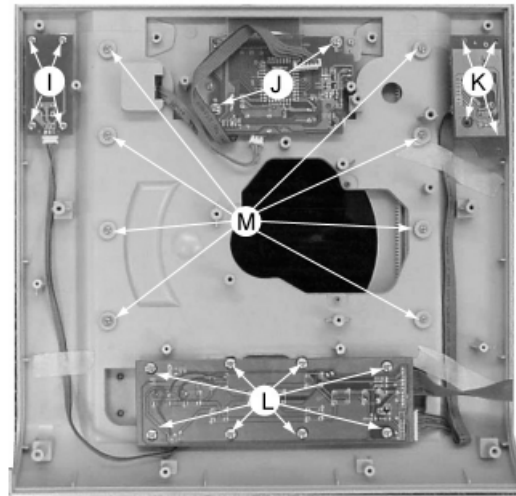


Figure 3

- 6) Loosen 4 screws K (see Figure 3) to remove the Key_B Board.
- 7) Loosen 8 screws L (see Figure 3) to remove the Key_A Board.
- 8) Loosen 8 screws M (see Figure 3) to remove the Door Eject Lever Bracket Right/Left, then remove CD door.

DISMANTLING INSTRUCTIONS

Repair Hints & Service Positions

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

Service position A



Figure 4

Service position B

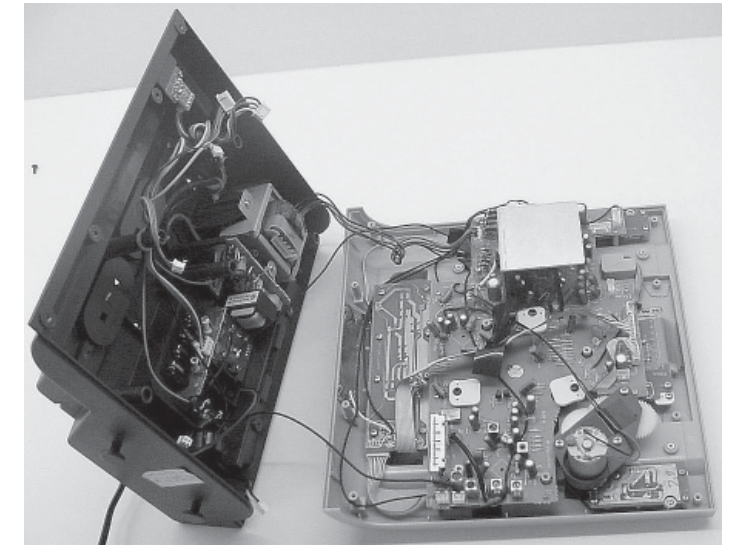


Figure 5

Service position C

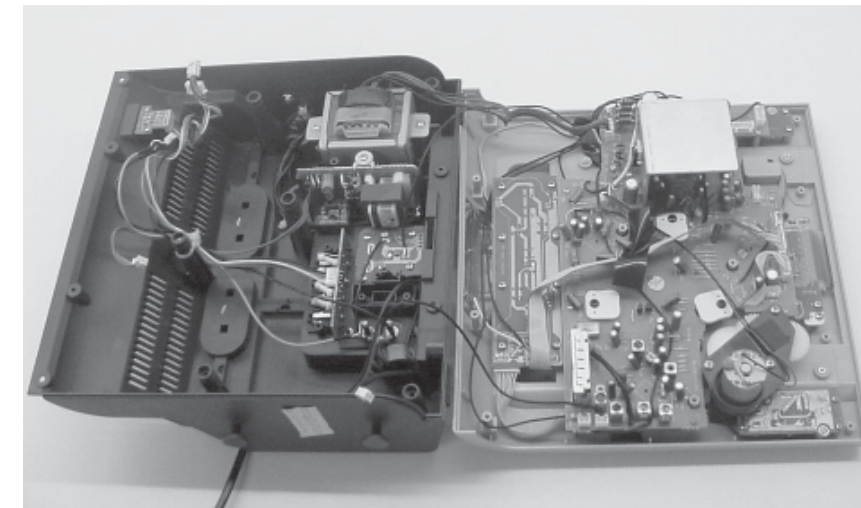


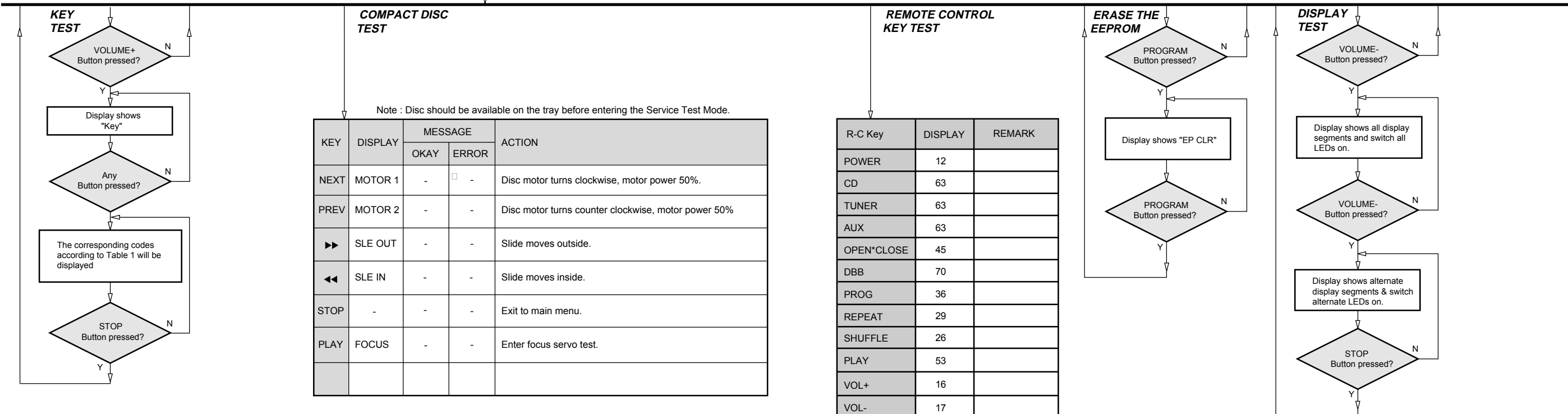
Figure 6

SERVICE TEST PROGRAM

To start service test program
PLAY & SOURCE
depressed while
plugging in the mains cord

Display shows the
ROM version
"VER XXX"
(Main menu)

VER refers to Version
XXX refers to Software version number of the uProcessor
(counting up from 010 to 999)

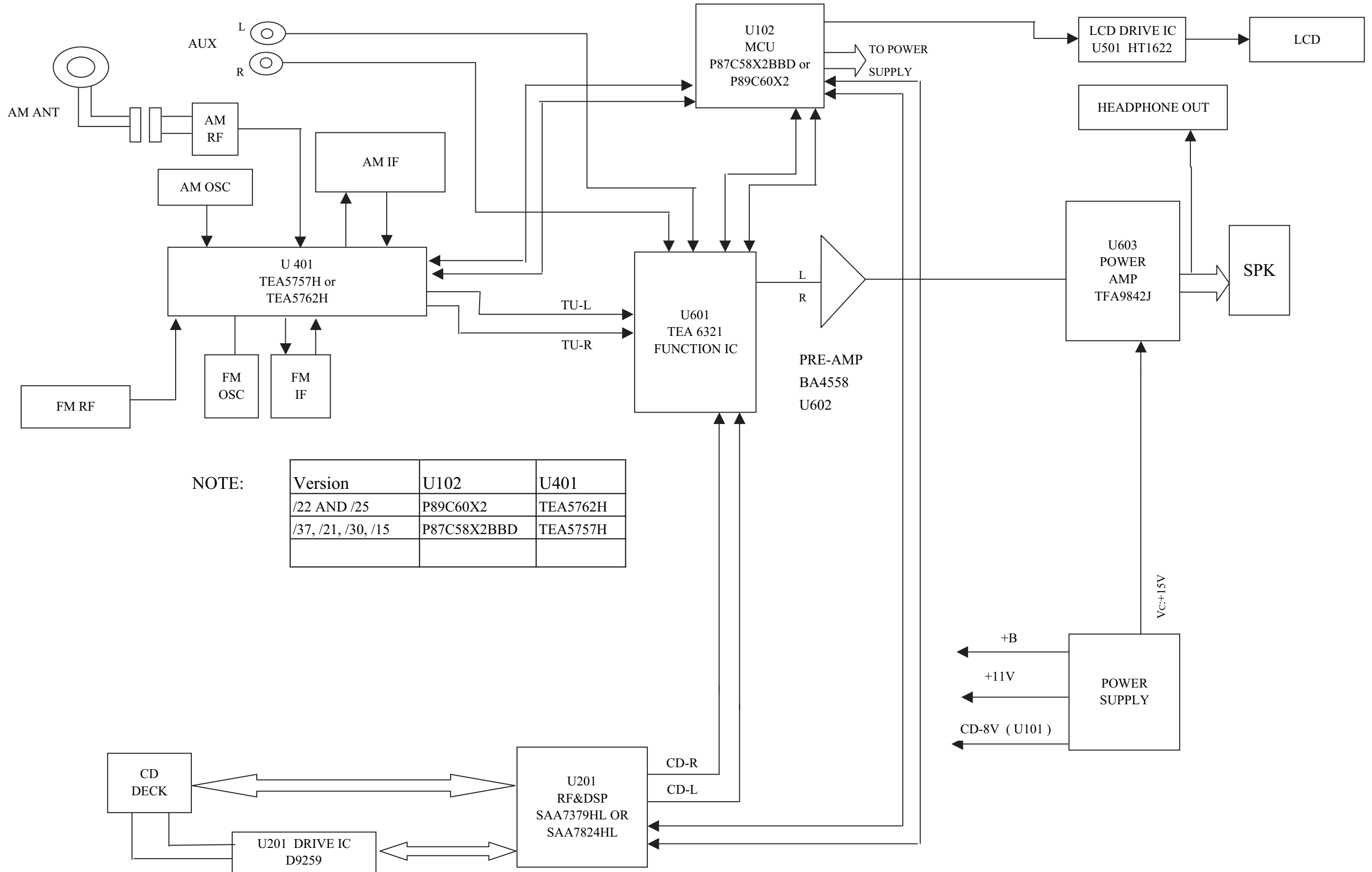


Main Set Key	DISPLAY
STANDBY-ON	32
OPEN*CLOSE	29
SOURCE-	11
DBB	17
BAND	10
PROGRAM	14
▶▶	18
◀◀	19
PLAY	20
□	24
VOLUME+	24
VOLUME-	23
PREVIOUS(◀)	12
NEXT (▶)	13

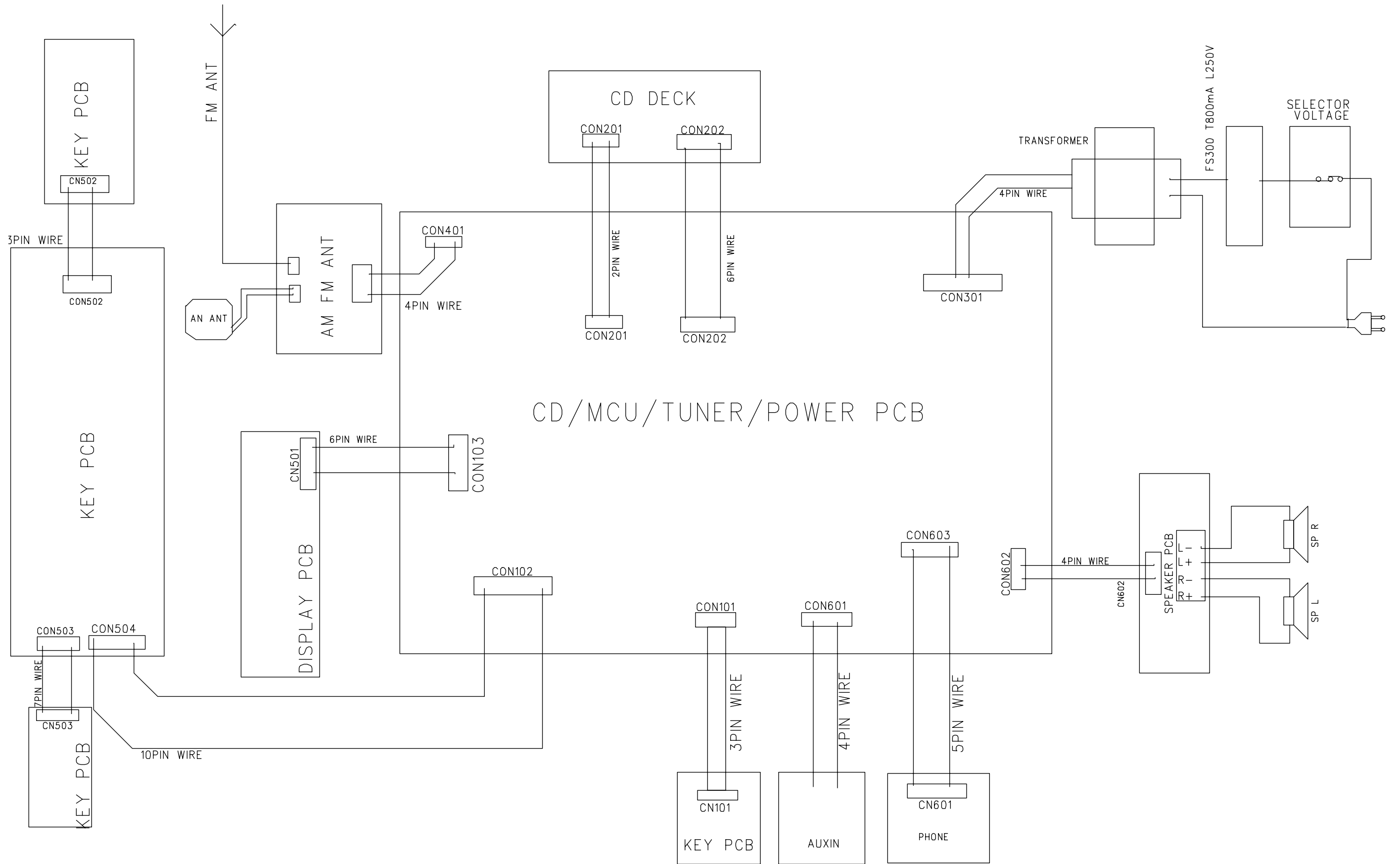
Table 1

Note : In Key test mode, if a key on the remote control is pressed, the display shows its corresponding code in track area.

SET BLOCK DIAGRAM



SET WIRING DIAGRAM

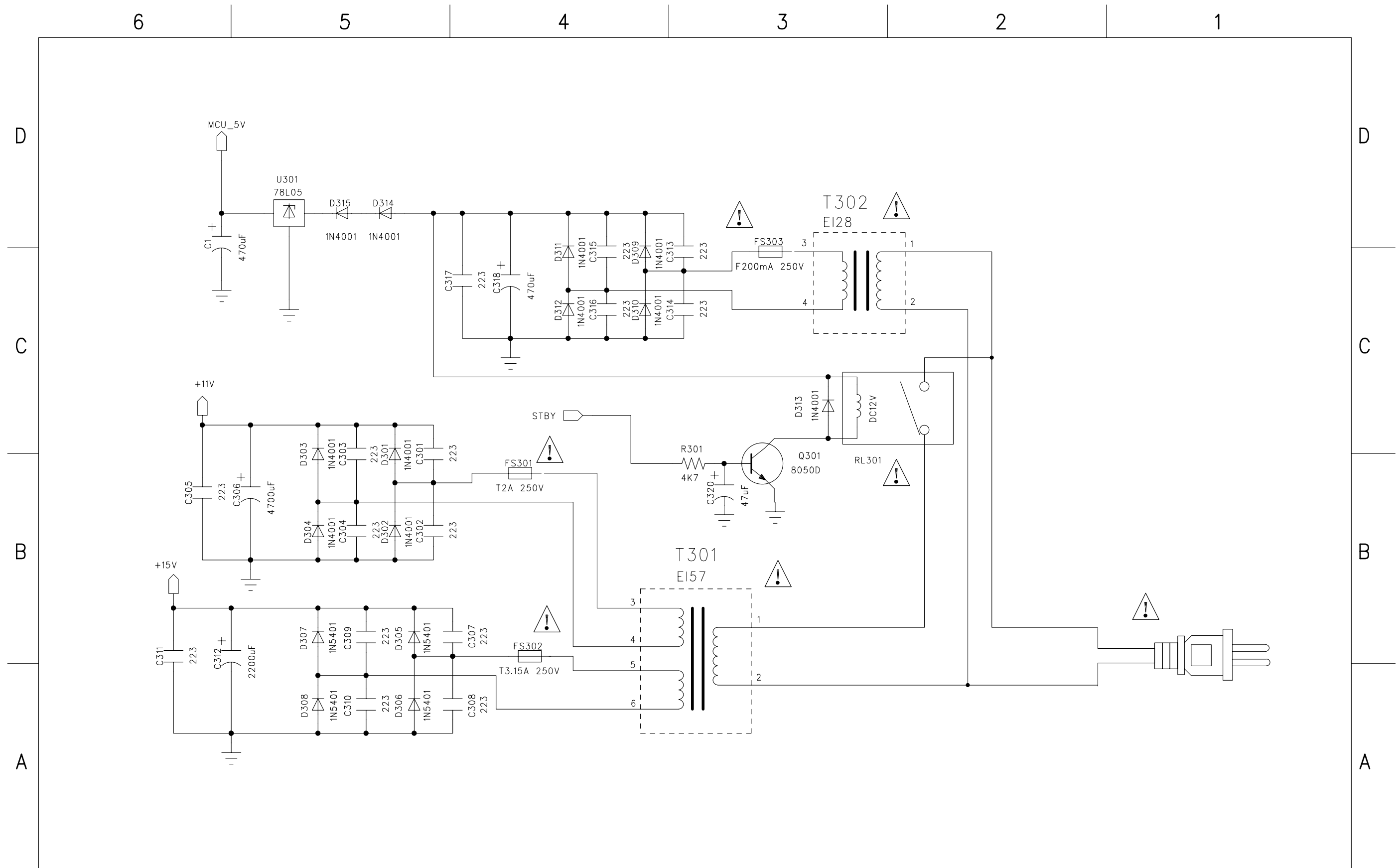


POWER BOARD

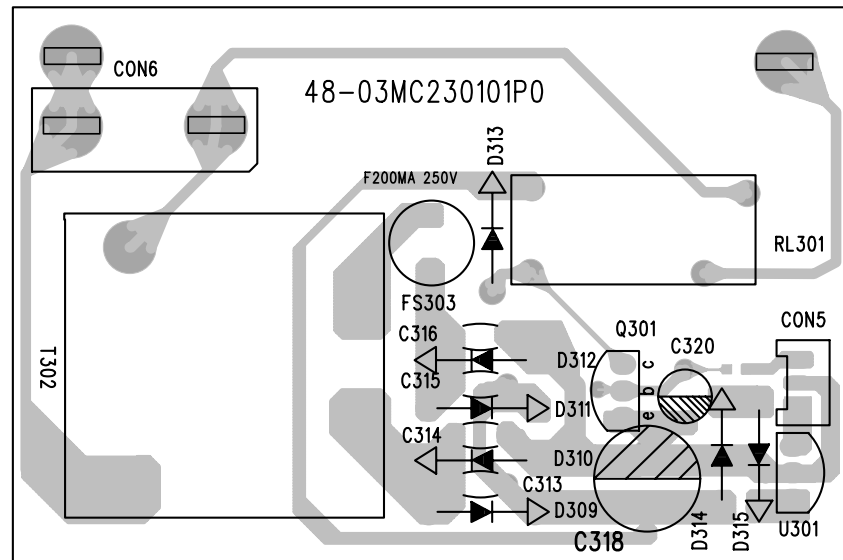
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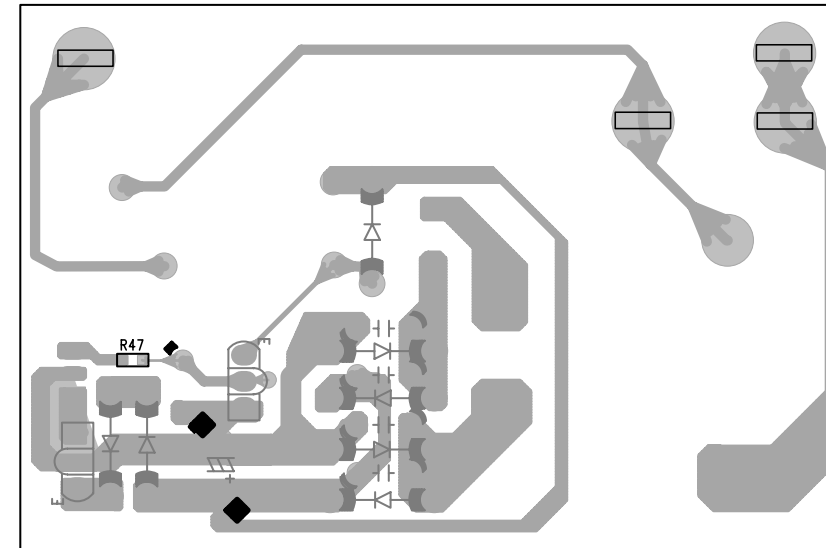
CIRCUIT DIAGRAM



LAYOUT DIAGRAM - POWER BOARD
COMPONENT SIDE



LAYOUT DIAGRAM - POWER BOARD
SMD SIDE

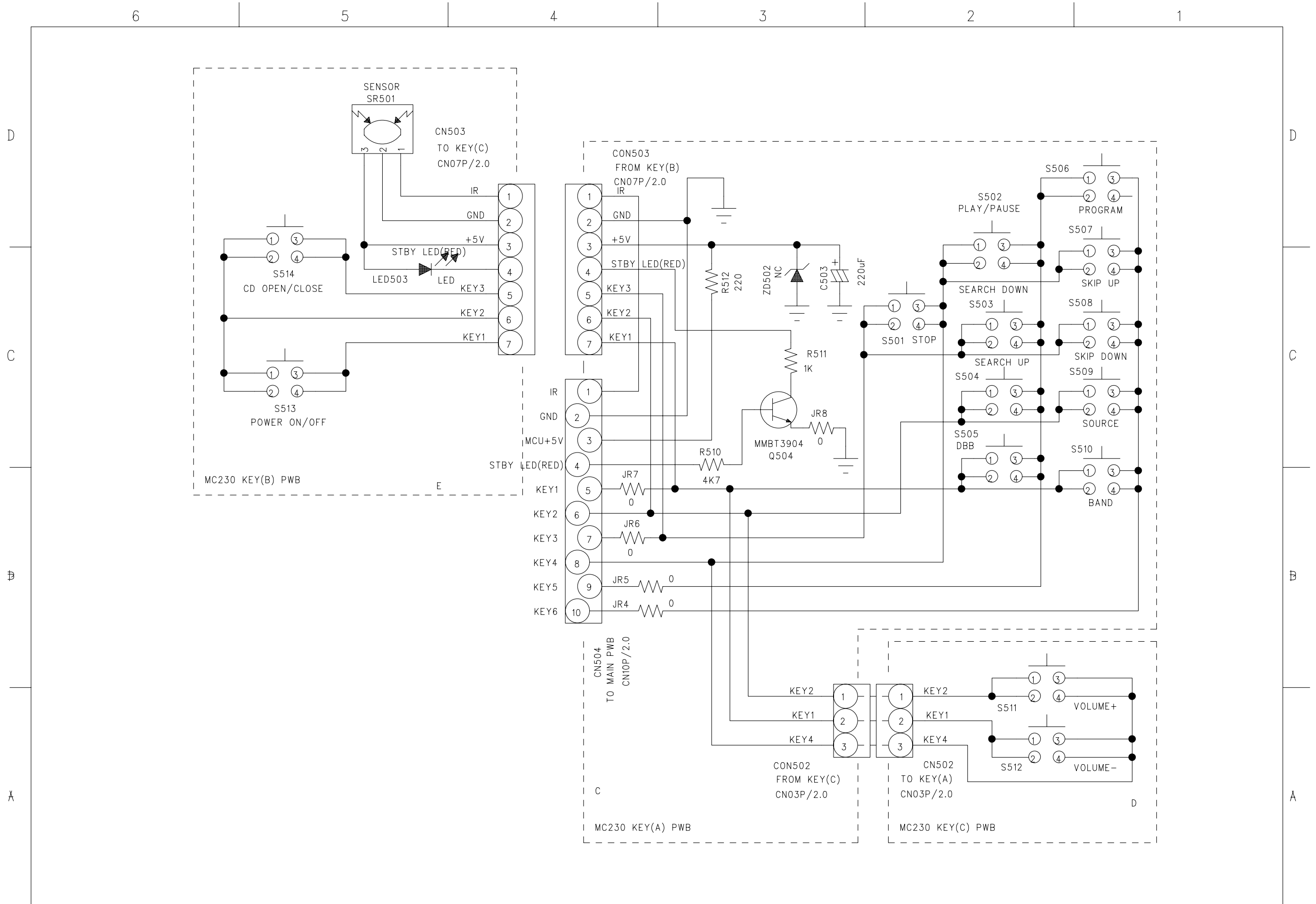


KEY BOARD

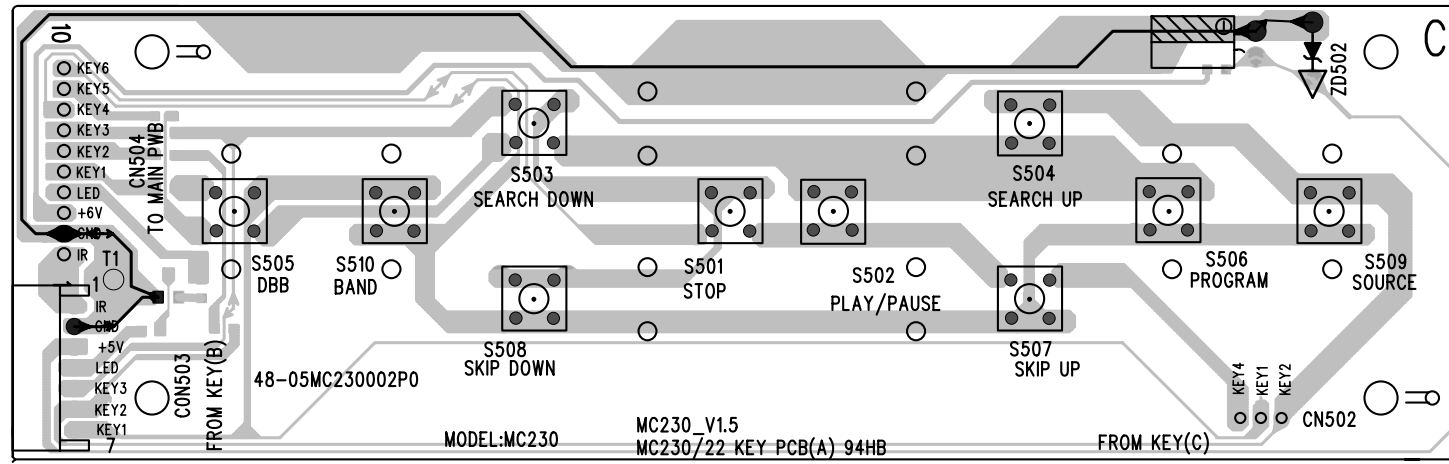
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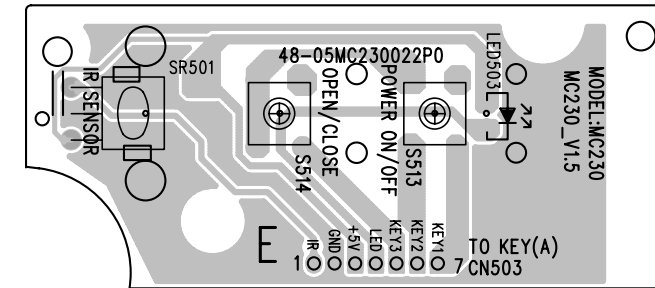
CIRCUIT DIAGRAM - FRONT BOARD



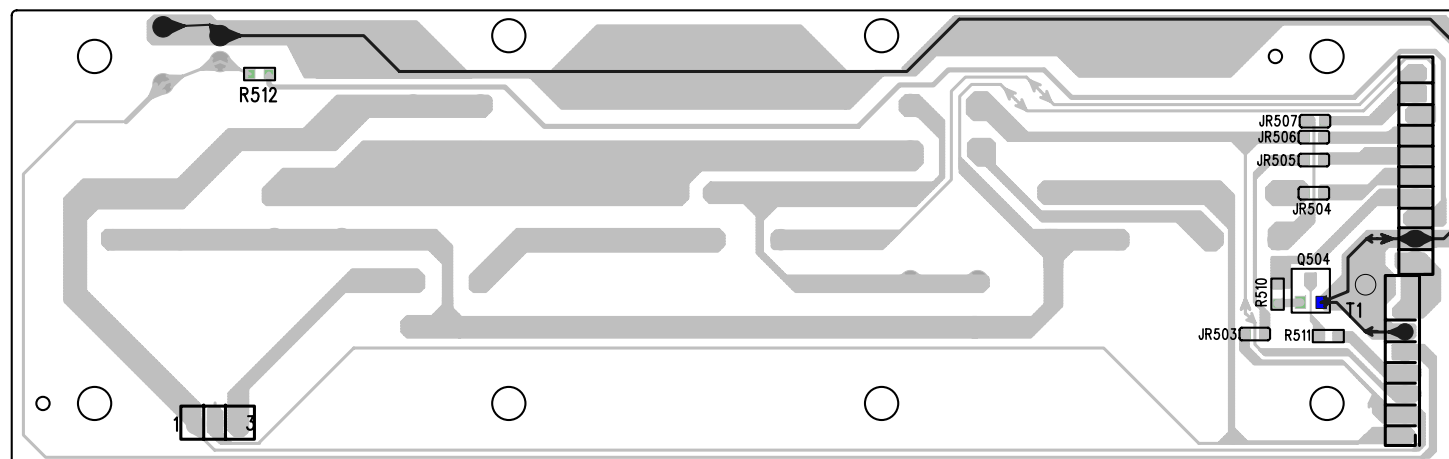
LAYOUT DIAGRAM - KEY_A BOARD COMPONENT SIDE



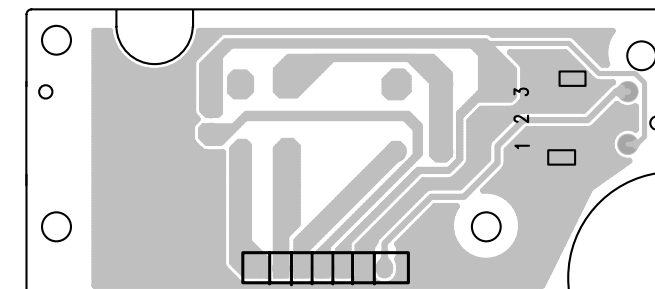
LAYOUT DIAGRAM - KEY_B BOARD COMPONENT SIDE



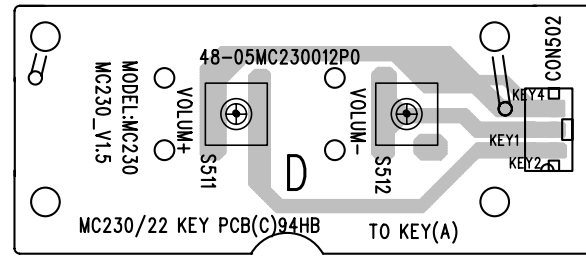
LAYOUT DIAGRAM - KEY_A BOARD SMD SIDE



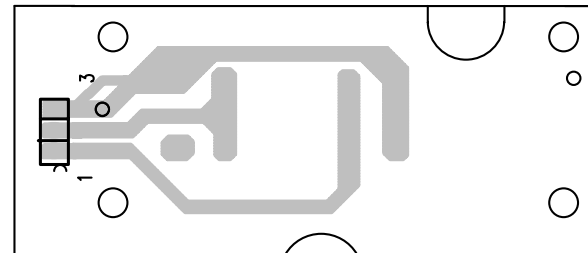
LAYOUT DIAGRAM - KEY_B BOARD SMD SIDE



LAYOUT DIAGRAM - KEY_C BOARD
COMPONENT SIDE



LAYOUT DIAGRAM - KEY_C BOARD
SMD SIDE



MAIN BOARD

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BLOCK DIAGRAM

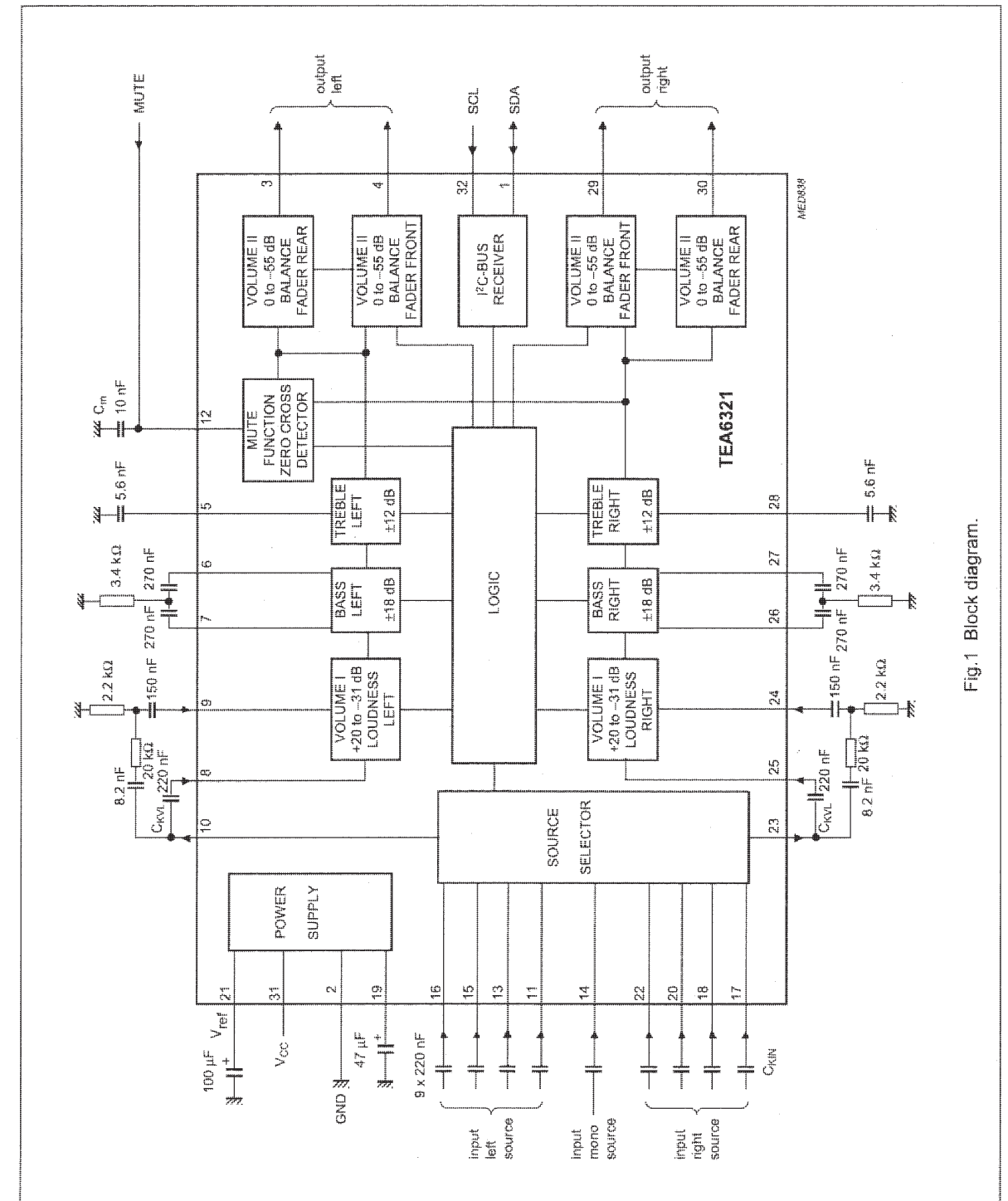
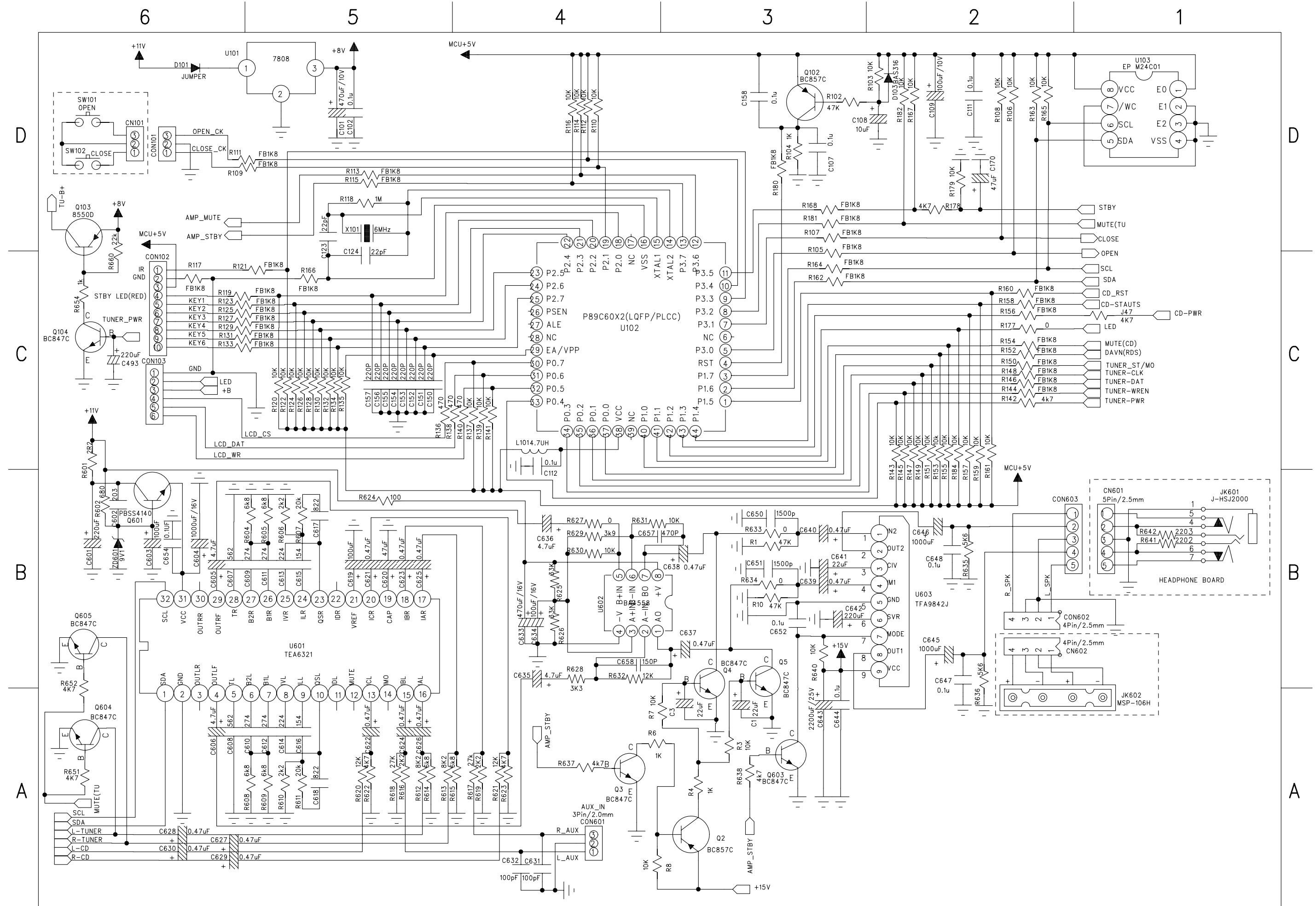
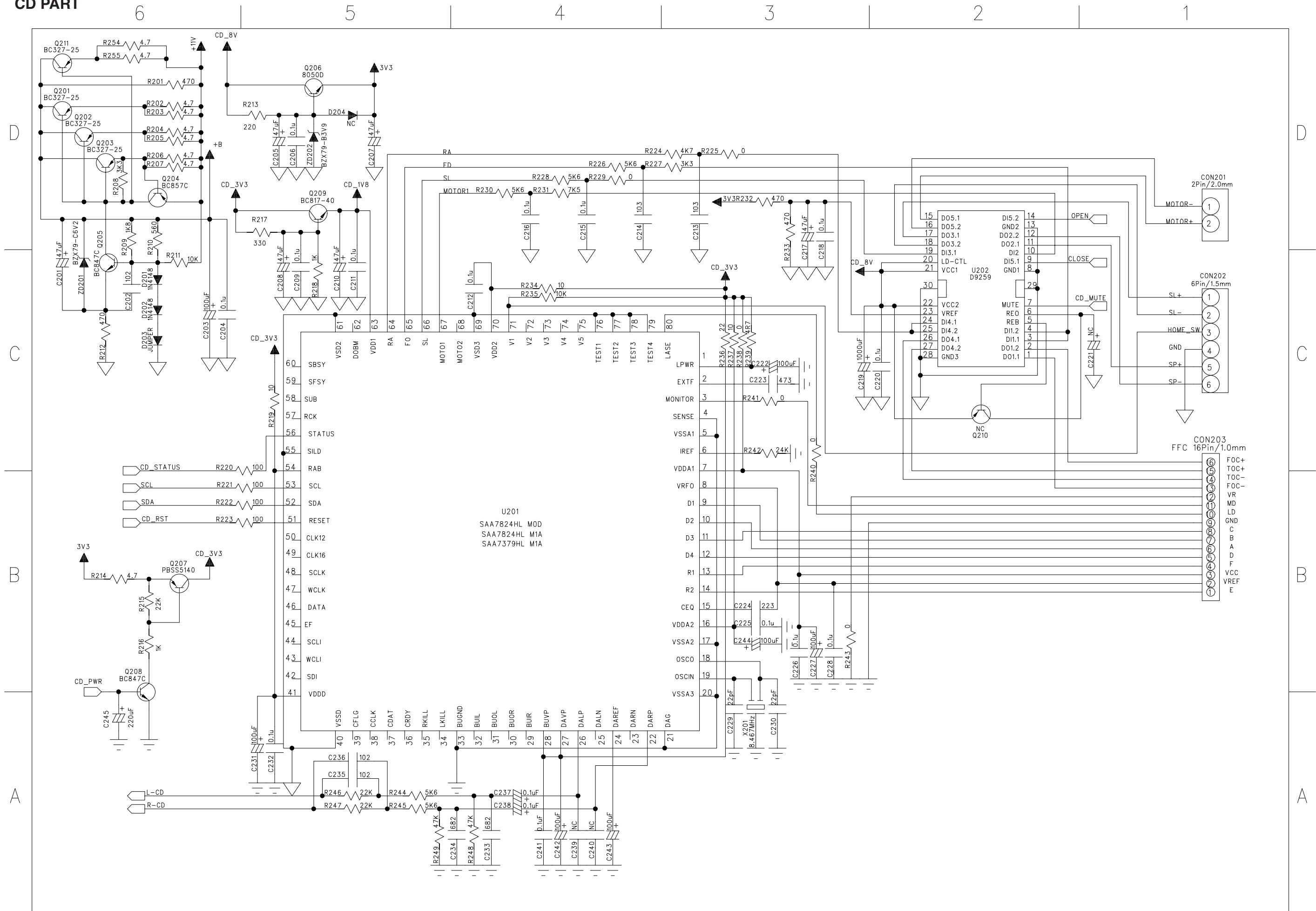


Fig.1 Block diagram.

MAIN BOARD - CIRCUIT DIAGRAM
MCU & AMP. PART



MAIN BOARD - CIRCUIT DIAGRAM CD PART



MAIN BOARD - CIRCUIT DIAGRAM TUNER PART

6

5

4

3

2

1

D

D

C

C

B

B

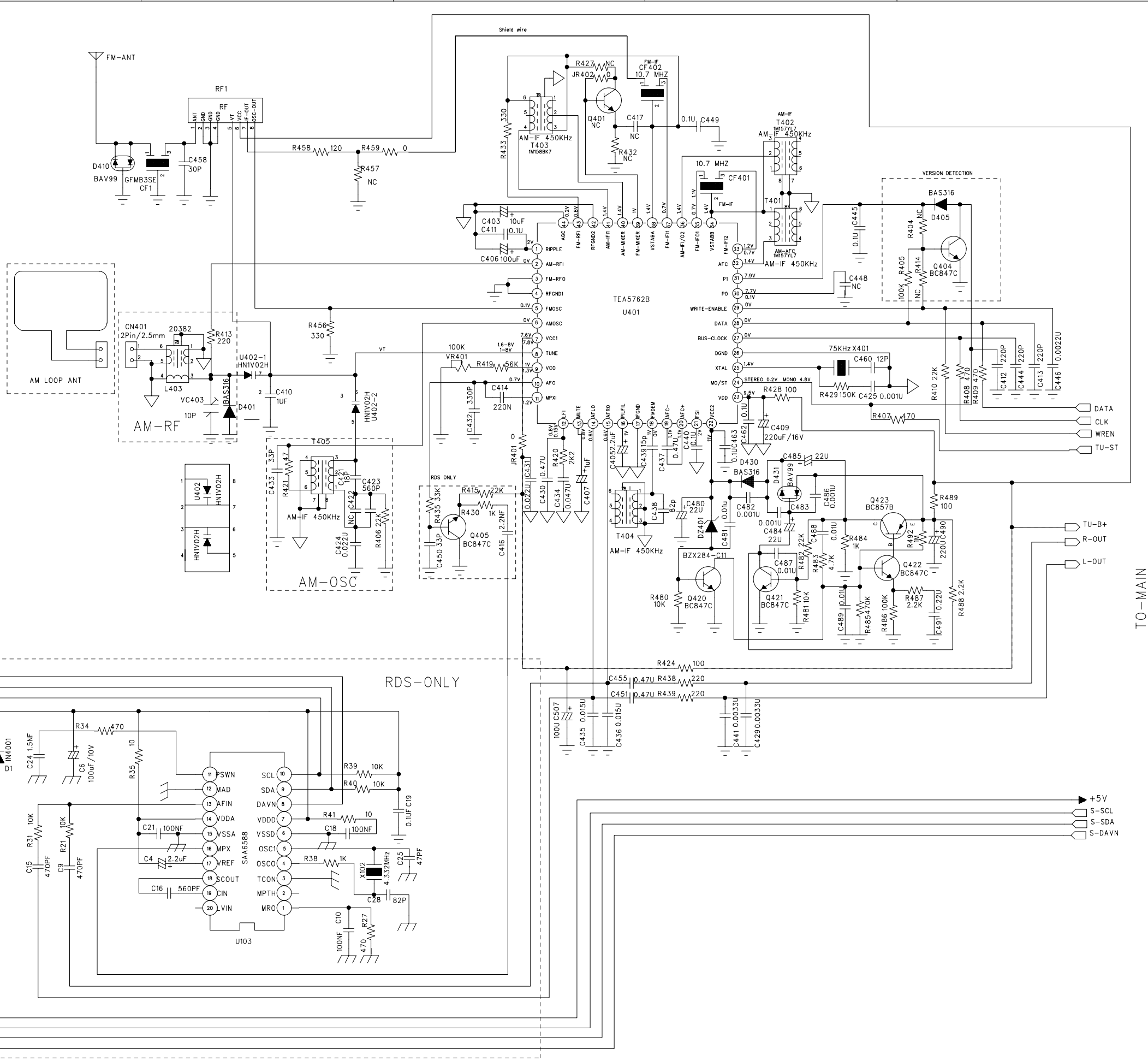
A

A

VERSION	D405	R404	R414	R405	Q404
/00/02 FM/MW		☒	☒		☒
/01 FM/MW		☒		☒	☒
/14 FM-DIRT/MW	☒		☒		☒
/17 FM/AM	☒			☒	☒
/06 FM-JAPAN/AM				☒	☒

☒ Component mounted

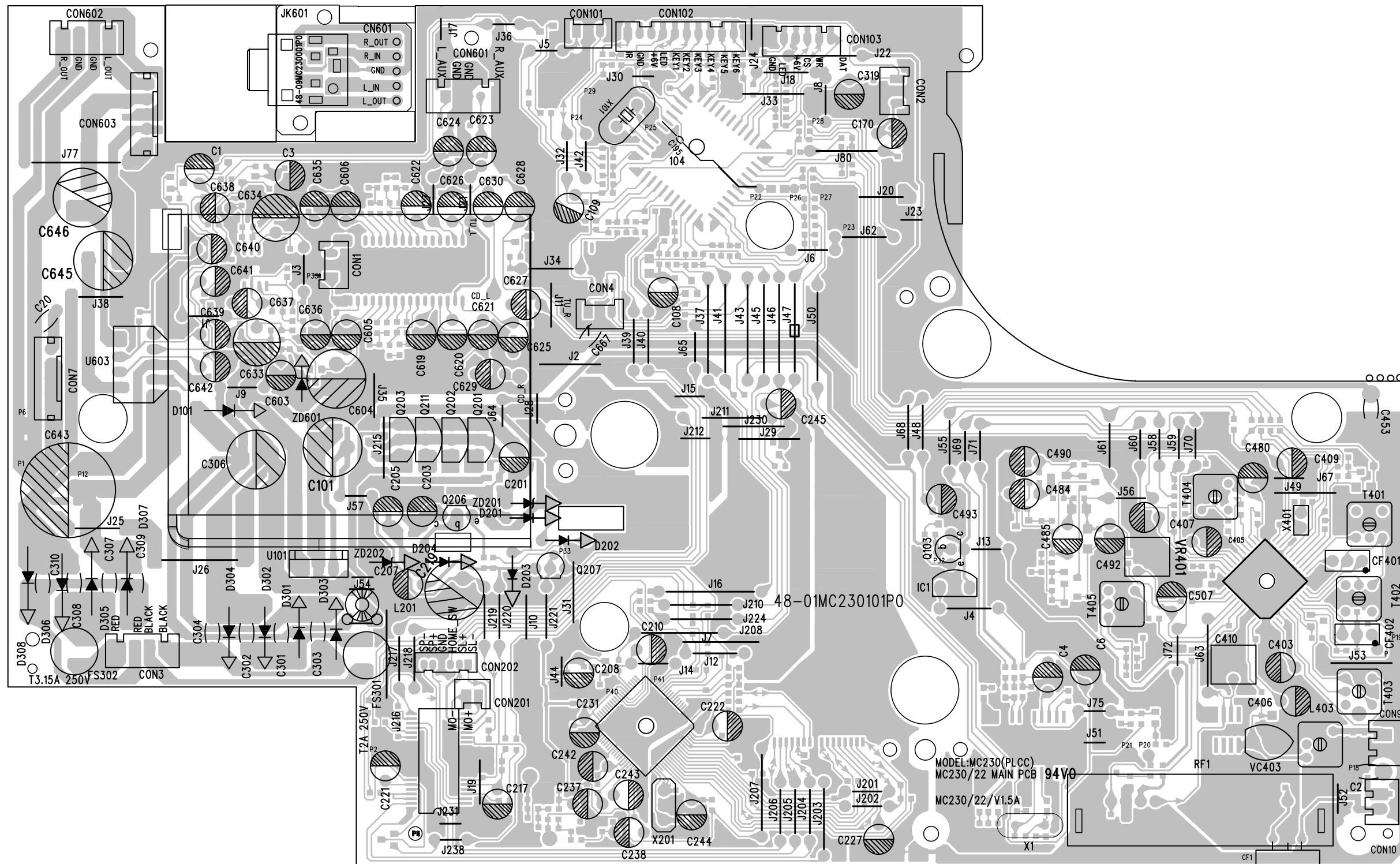
VERSION DETECTION			
ITEM	USA	EU	JAPAN
C426	15P	12P	2P2
C428	0.033U	560P	



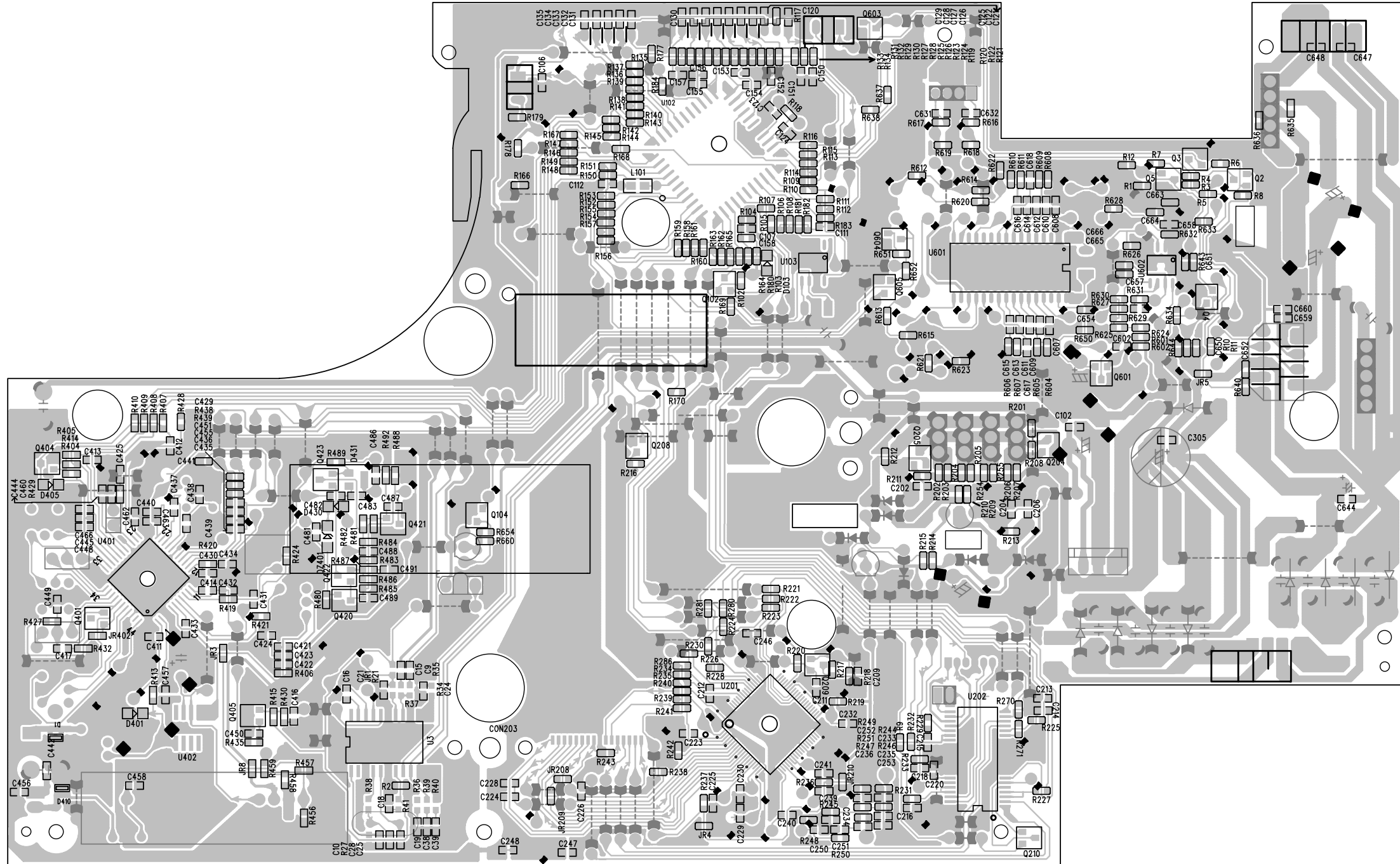
TO-MAIN

- +5V
- S-SCL
- S-SDA
- S-DAVN

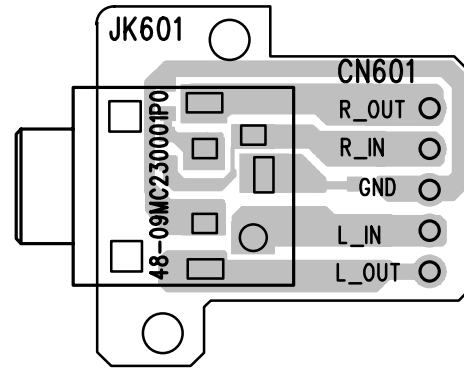
MAIN PCB - COMPONENT LAYOUT



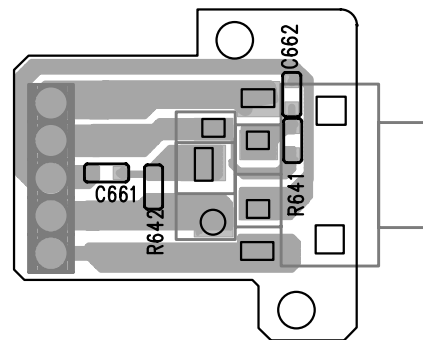
MAIN PCB - COMPONENT LAYOUT



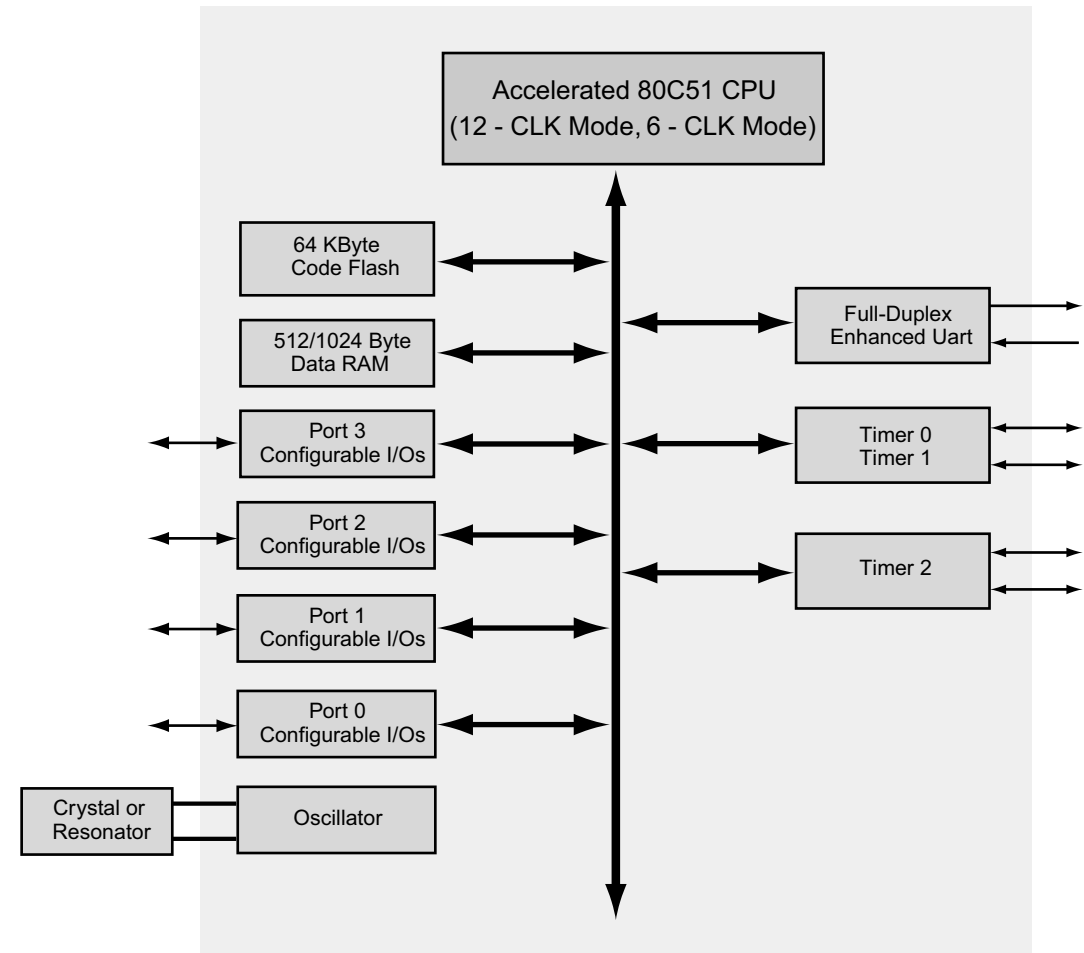
HEADPHONE PCB - TOP LAYOUT



HEADPHONE PCB - BOTTOM LAYOUT



FLASH MICROCONTROLLER
P89C60X2/P89C61X2--BLOCK DIAGRAM

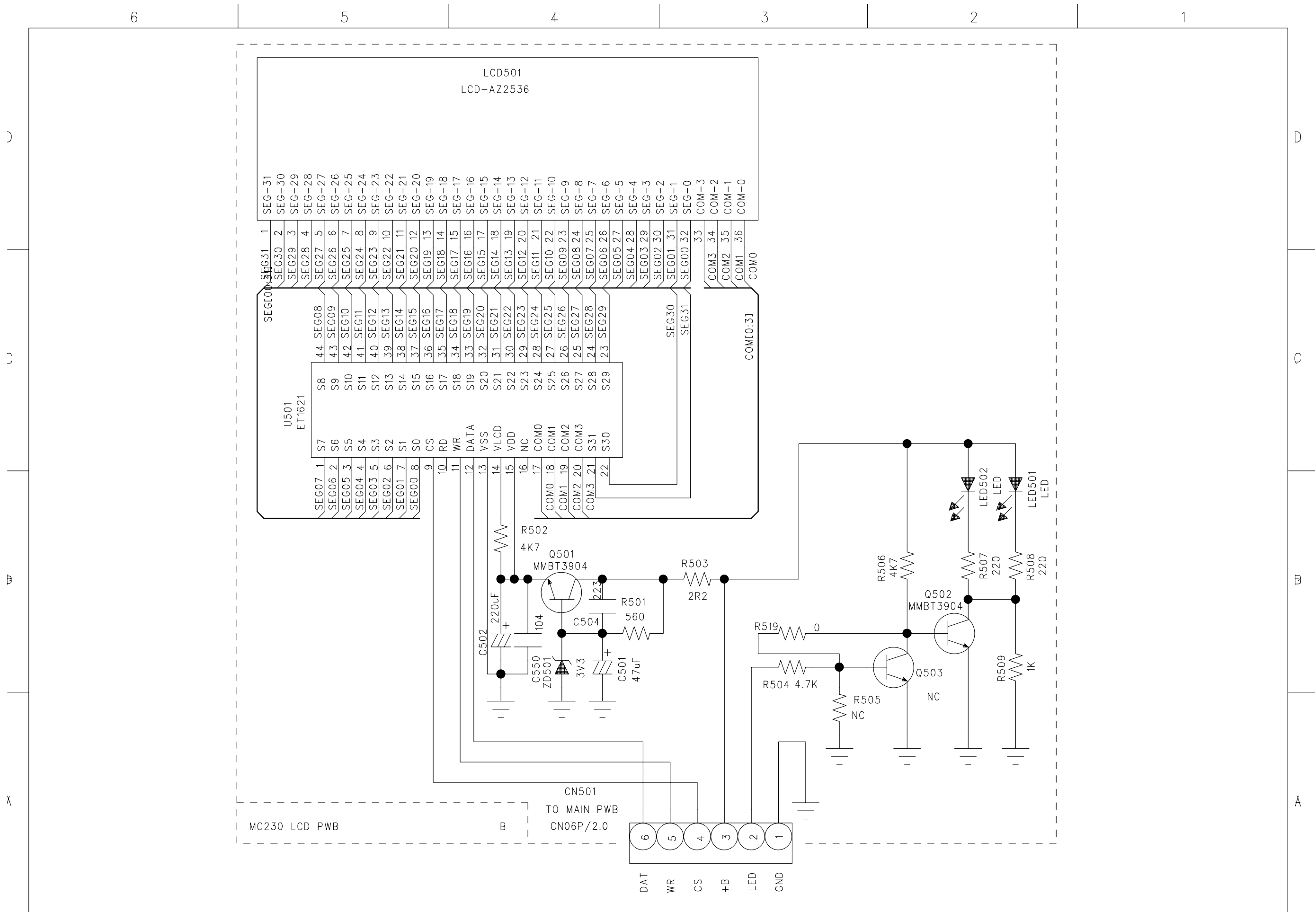


DISPLAY BOARD

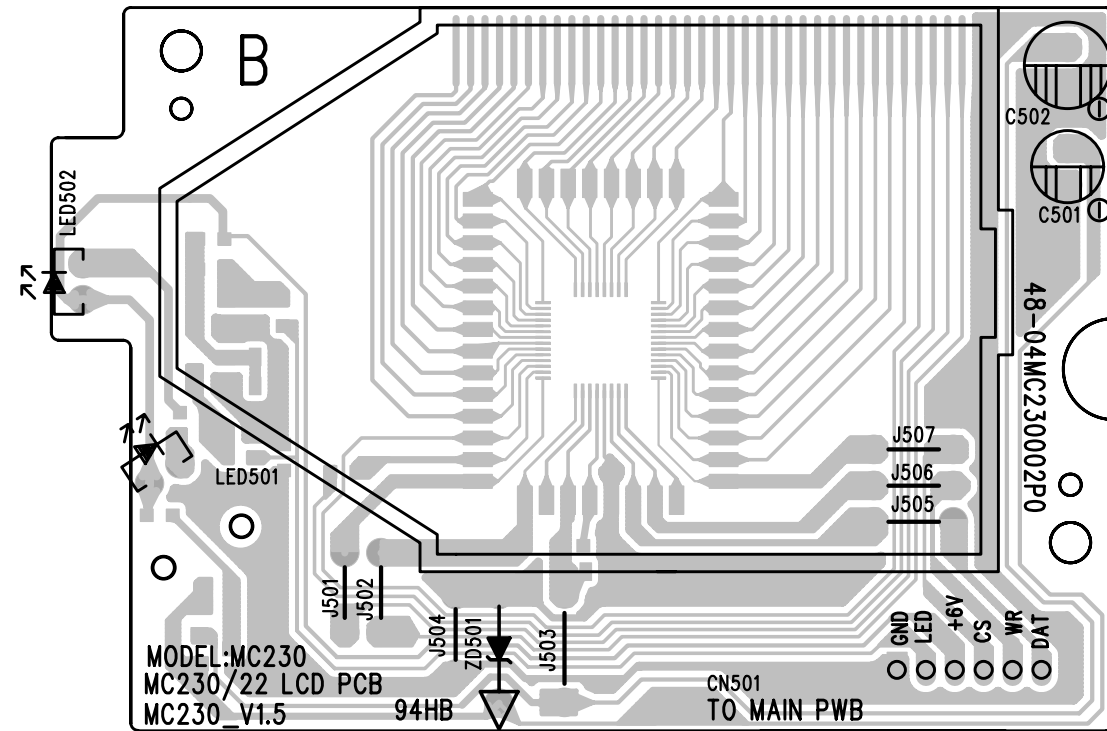
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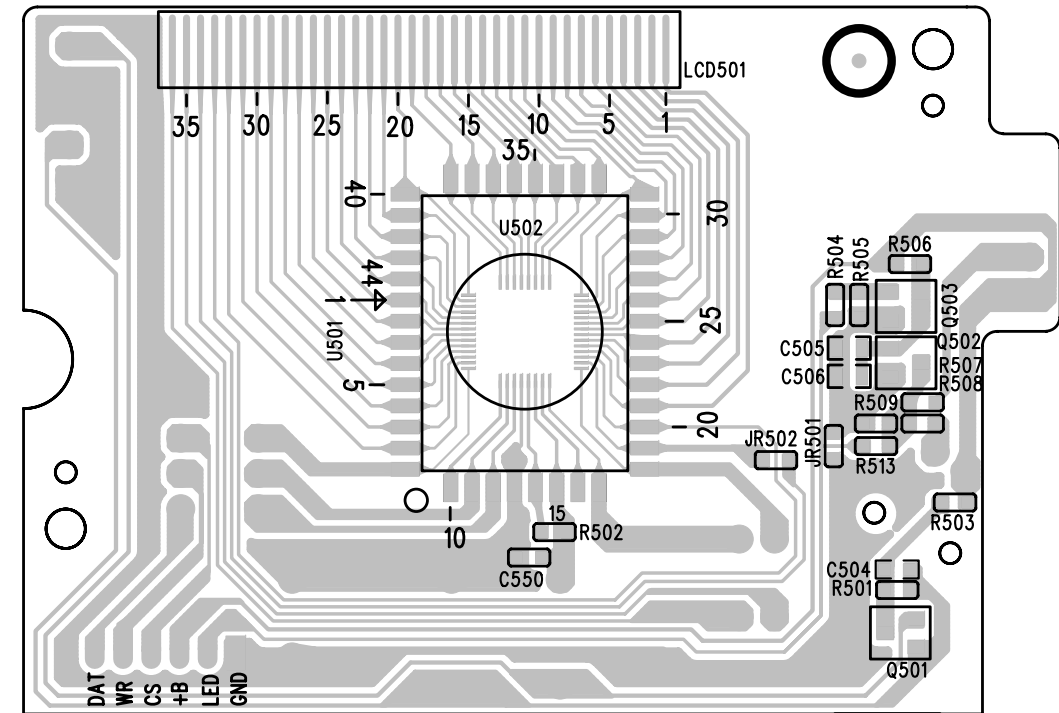
CIRCUIT DIAGRAM - DISPLAY BOARD



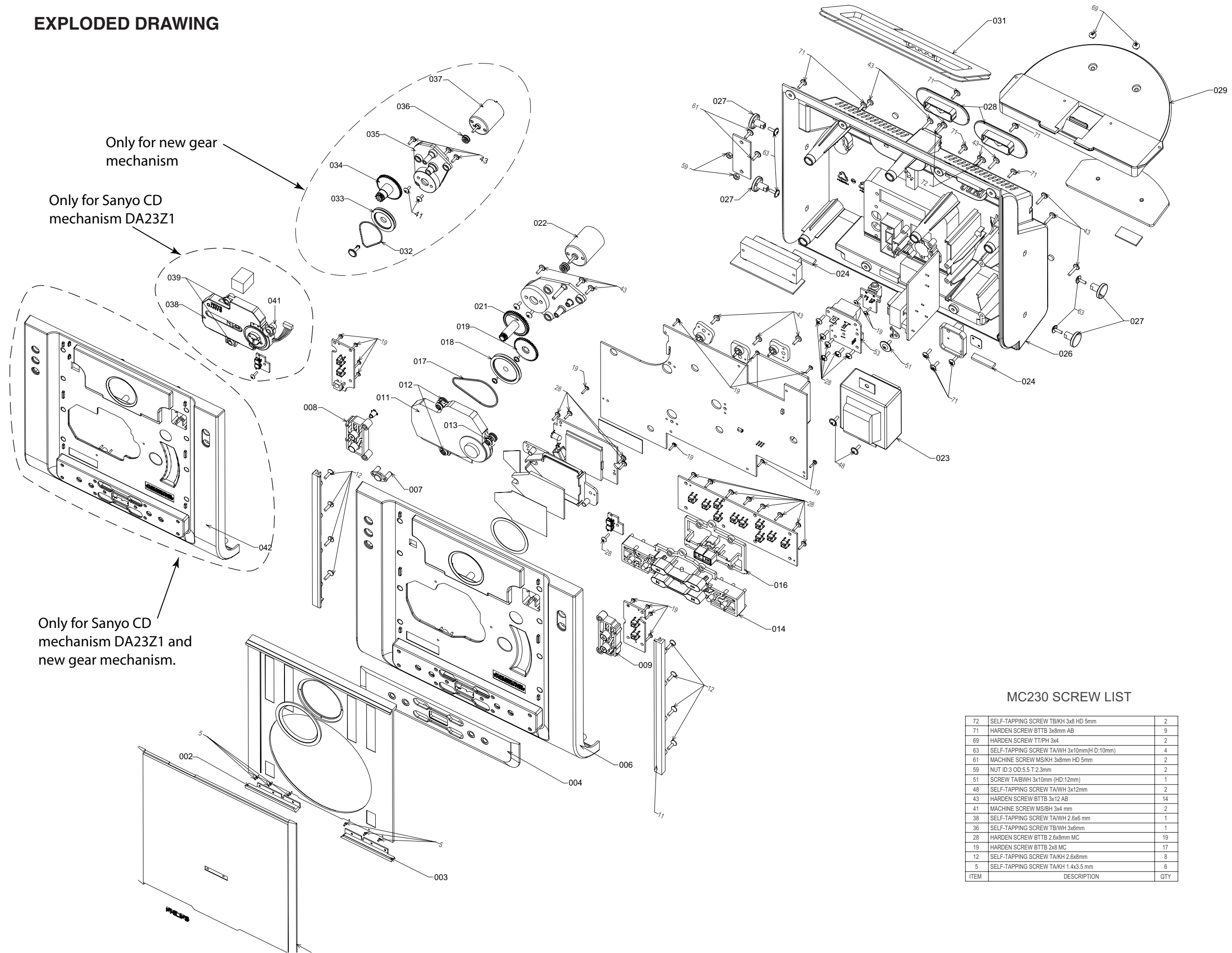
LAYOUT DIAGRAM - DISPLAY BOARD
COMPONENT SIDE



LAYOUT DIAGRAM - DISPLAY BOARD
SMD SIDE



EXPLODED DRAWING



MC230 SCREW LIST

ITEM	DESCRIPTION	QTY
72	SELF-TAPPING SCREW TBKH 3x8 HD 5mm	2
71	HARDEN SCREW BTTB 3x8mm AB	9
69	HARDEN SCREW TT/PH 3x4	2
63	SELF-TAPPING SCREW TA/WH 3x10mm(H D:10mm)	4
61	MACHINE SCREW MS/KH 3x8mm HD 5mm	2
59	NUT ID:3 OD:5.5 T:2.3mm	2
51	SCREW TA/BWH 3x10mm (HD:12mm)	1
48	SELF-TAPPING SCREW TA/WH 3x12mm	2
43	HARDEN SCREW BTTB 3x12 AB	14
41	MACHINE SCREW MS/WH 3x4 mm	2
38	SELF-TAPPING SCREW TA/WH 2.6x6 mm	1
36	SELF-TAPPING SCREW TB/WH 3x6mm	1
28	HARDEN SCREW BTTB 2.6x8mm MC	19
19	HARDEN SCREW BTTB 2x8 MC	17
12	SELF-TAPPING SCREW TA/KH 2.6x8mm	8
5	SELF-TAPPING SCREW TA/KH 1.4x3.5 mm	6

MECHANICAL & ACCESSORIES PARTSLIST

001	9940 000 00303	CD DOOR LENS /22/25	031	9940 000 00243	AM/FM ANT ASS'Y /21/22/25/30
001	9940 000 00595	CD DOOR LENS /21/30	031	9940 000 00308	AM/FM ANT ASS'Y /37
001	9940 000 00599	CD DOOR LENS /37	△	9940 000 00512	AC CORD BS PLUG 2M /25
002	9940 000 00292	CD DOOR COVER -LEFT	△	9940 000 00593	AC CORD SAA APP 2M /30
003	9940 000 00293	CD DOOR COVER -RIGHT		9940 000 00246	REMOTE CONTROL UNIT
004	9940 000 00304	CONTROL PANEL LENS /22/25/37		9940 000 00247	SPEAKER BOX UNIT (LEFT)
004	9940 000 00596	CONTROL PANEL LENS /21/30		9940 000 00309	SPEAKER BOX UNIT (LEFT) /37
006	9940 000 00289	FRONT CABINET /22/25		9940 000 00248	SPEAKER BOX UNIT (RIGHT)
006	9940 000 00318	FRONT CABINET /37		9940 000 00311	SPEAKER BOX UNIT (RIGHT)/37
006	9940 000 00591	FRONT CABINET /21/30	△	9940 000 00282	AC CORD VDE APP 2M /21/22
007	9940 000 00305	SENSOR LENS	△	9940 000 00317	AC CORD CUL APP 6FT /37
008	9940 000 00297	POW CD OPEN BUTT /22/25			
008	9940 000 00321	POW CD OPEN BUTT /21/30/37			
009	9940 000 00298	VOL +/- BUTTON /22/25			
009	9940 000 00322	VOL +/- BUTTON /21/30/37			
011	9940 000 00279	CD MECHANISM TPP381			
012	9940 000 00287	SHOCK ABSORBER			
013	9940 000 00288	SHOCK ABSORBER			
014	9940 000 00302	FUNCTION BUTTON /22/25			
014	9940 000 00324	FUNCTION BUTTON /21/30/37			
016	9940 000 00299	FUNC BUTTON S/P /22/25			
016	9940 000 00323	FUNC BUTTON S/P /21/30/37			
017	9940 000 00589	DRIVE BELT (DIA:38X1MM)			
018	9940 000 00296	DRIVER PULLEY GEAR			
019	9940 000 00295	IDLER GEAR			
021	9940 000 00294	DRIVING GEAR			
022	9940 000 00286	MOTOR 5V			
023	△ 9940 000 00278	TRANSFORMER 230V /22/25			
023	△ 9940 000 00316	TRANSFORMER 120V /37			
023	△ 9940 000 00597	H/TRANSFORMER 120/230V /21			
023	△ 9940 000 00598	H/TRANSFORMER 240V /30			
024	9940 000 00284	RUBBER FOOT			
026	9940 000 00291	REAR CABINET /22/25/30			
026	9940 000 00319	REAR CABINET (94V2) /37			
026	9940 000 00592	REAR CABINET /21			
027	9940 000 00283	SPEAKER HOLDER			
028	9940 000 00307	SPEAKER WIRE HOLDER			
029	9940 000 00306	STAND UNIT			

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

ELECTRICAL PARTSLIST

AUX	9940 000 00281	RCA JACK BD 2P	U601	9940 000 00366	IC TEA6321
CF1	9940 000 00245	BAND PASS FILTER	U602	9940 000 00249	IC (ROHM) BA4558F
D407	9940 000 00312	VARICAP DIODE /21/30/37	U603	9940 000 00367	IC (PHILIPS) TFA9842J
D408	9940 000 00312	VARICAP DIODE /21/30/37	VC402	9940 000 00314	TRIMMER 10PF 6MM
FS300	9940 000 00588	GLASS FUSE T800MA/250V/21	VC403	9940 000 00254	TRIMMER 10PF 6MM (WH)
FS301	△ 9940 000 00258	CERAMIC FUSE /22/25/37	VR401	9940 000 00313	SEMI FIXED VRB100K 6MM
FS301	△ 9940 000 00585	CERAMIC FUSE 2A/250V /21/30	X201	9940 000 00255	CER RESONATOR 8.4672MHZ
FS302	△ 9940 000 00259	CERAMIC FUSE /22/25/37		9940 000 00587	SWITCH /21M
FS302	△ 9940 000 00586	GLASS FUSE 3.15A/250V /21/30			
FS303	△ 9940 000 00263	SUBMINIATURE FUSE 100MA/250V			
IC1	9940 000 00277	IC (LIBERAL) LM78L05			
JK401	9940 000 00275	RCA PIN JACK #RCA-125			
JK601	9940 000 00257	PHONE JACK MSJ-2000(ST)			
JK602	9940 000 00276	SPK JACK (R/B/R/B)			
LCD501	9940 000 00268	LCD DISPLAY			
LED501	9940 000 00266	LED LAMP 3MM (BLUE)			
LED502	9940 000 00267	LED LAMP 5MM (BLUE)			
LED503	9940 000 00265	LED LAMP (MICRO)			
RF1	9940 000 00256	TUNER (MITSUMI) FE450-G01			
RL301	9940 000 00264	RELAY			
S501	9940 000 00274	TACT SWITCH TSA-064301-100			
S502	9940 000 00274	TACT SWITCH TSA-064301-100			
S503	9940 000 00274	TACT SWITCH TSA-064301-100			
S504	9940 000 00274	TACT SWITCH TSA-064301-100			
S505	9940 000 00274	TACT SWITCH TSA-064301-100			
S506	9940 000 00274	TACT SWITCH TSA-064301-100			
S507	9940 000 00274	TACT SWITCH TSA-064301-100			
S508	9940 000 00274	TACT SWITCH TSA-064301-100			
S509	9940 000 00274	TACT SWITCH TSA-064301-100			
S510	9940 000 00274	TACT SWITCH TSA-064301-100			
S511	9940 000 00274	TACT SWITCH TSA-064301-100			
S512	9940 000 00274	TACT SWITCH TSA-064301-100			
S513	9940 000 00274	TACT SWITCH TSA-064301-100			
S514	9940 000 00274	TACT SWITCH TSA-064301-100			
SR501	9940 000 00272	OPTIC SENSOR /22			
SR501	9940 000 00325	OPTIC SENSER /21/30/37			
SW601	9940 000 00273	MICRO SWITCH 1120B			
SW602	9940 000 00273	MICRO SWITCH 1120B			
T302	△ 9940 000 00262	TRANSF. EI-28 AC230V /22/25			
U101	9940 000 00253	IC (SAMSUNG) KA7808			
U102	9965 100 18658	IC P89V51RD2FBC W/SW /22/25			
U102	9940 000 00368	IC P87C58X2BBD W/SW /21/30/37			
U103	9940 000 00251	IC (ROHM) BR24L04			
U201	9940 000 00365	IC (PHILIPS) SAA7379HL CD-18			
U202	9940 000 00252	IC MOTOR DRIVER D9259			
U301	9940 000 00261	IC (LIBERAL) LM78L05			
U401	9351 772 20557	IC SM TEA5762H/V1 (PHSE) Y			
U501	9940 000 00269	IC ET1621 COB LCD DRIVER			

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

MECHANICAL & ACCESSORIES PARTSLIST FOR CDM DA23Z1

001	9940 000 00303	CD DOOR LENS /22/25	037	9940 000 02815	DC MOTOR 5V
001	9940 000 00595	CD DOOR LENS /21/30	038	9940 000 02822	CD MECHANISM DA23Z1
001	9940 000 00599	CD DOOR LENS /37	039	9940 000 02816	SHOCK ABSORBER (BLACK)
002	9940 000 00292	CD DOOR COVER -LEFT	041	9940 000 02817	SHOCK ABSORBER (GREY)
003	9940 000 00293	CD DOOR COVER -RIGHT	042	9940 000 04095	FRONT CABINET /22/25
004	9940 000 00304	CONTROL PANEL LENS /22/25/37	042	9940 000 04096	FRONT CABINET /21M/30
004	9940 000 00596	CONTROL PANEL LENS /21/30	042	9940 000 04098	FRONT CABINET /37
006	9940 000 00289	FRONT CABINET /22/25	REM	9940 000 00246	REMOTE CONTROL /MC230
006	9940 000 00318	FRONT CABINET /37	REM	9940 000 02008	REMOTE CONTROL /MC235B
006	9940 000 00591	FRONT CABINET /21/30		9940 000 00247	SPEAKER BOX UNIT (LEFT)
007	9940 000 00305	SENSOR LENS		9940 000 00309	SPEAKER BOX UNIT (LEFT) /37
008	9940 000 00297	POW CD OPEN BUTT /22/25		9940 000 00248	SPEAKER BOX UNIT (RIGHT)
008	9940 000 00321	POW CD OPEN BUTT /21/30/37		9940 000 00311	SPEAKER BOX UNIT (RIGHT)/37
009	9940 000 00298	VOL +/- BUTTON /22/25		9965 100 02009	SPEAKER BOX UNIT (L) /MC235B
009	9940 000 00322	VOL +/- BUTTON /21/30/37		9965 100 02010	SPEAKER BOX UNIT (R) /MC235B
011	9940 000 00279	CD MECHANISM TPP381		9965 100 02028	FRONT CAB. ASS'Y /MC235B
012	9940 000 00287	SHOCK ABSORBER		9965 100 02044	REAR CAB. ASS'Y /MC235B/79
013	9940 000 00288	SHOCK ABSORBER		9965 100 02029	CD DOOR ASS'Y /MC235B
014	9940 000 00302	FUNCTION BUTTON /22/25		9965 100 02012	UNIT STAND /MC235B
014	9940 000 00324	FUNCTION BUTTON /21/30/37	△	9965 100 00909	AC CORD VDE APP 2M /12
016	9940 000 00299	FUNC BUTTON S/P /22/25	△	9965 100 02011	AC CORD CUL APP 6FT. /37
016	9940 000 00323	FUNC BUTTON S/P /21/30/37	△	9940 000 00282	AC CORD VDE APP 2M /21M/22
017	9940 000 00589	DRIVE BELT	△	9940 000 00317	AC CORD CUL APP 6FT /37
018	9940 000 00296	DRIVER PULLEY GEAR	△	9940 000 00512	AC CORD BS PLUG 2M /25
019	△ 9940 000 00295	IDLER GEAR	△	9940 000 00593	AC CORD SAA APP 2M /30/79
021	△ 9940 000 00294	DRIVING GEAR			
022	△ 9940 000 00286	MOTOR 5V			
023	△ 9940 000 00278	TRANSFORMER 230V /22/25/05			
023	△ 9965 100 03655	TRANSFORMER 230V /MC235B/12/05			
023	△ 9940 000 00316	TRANSFORMER 120V /37			
023	△ 9940 000 00597	TRANSFORMER 120/230V /21			
023	△ 9940 000 00598	TRANSFORMER 240V /30/79	Note: Only these parts mentioned in the list are normal		
024	9940 000 00284	RUBBER FOOT			
026	9940 000 00291	REAR CABINET /22/25/30	service parts.		
026	9940 000 00319	REAR CABINET (94V2) /37			
026	9940 000 00592	REAR CABINET /21			
027	9940 000 00283	SPEAKER HOLDER			
028	9940 000 00307	SPEAKER WIRE HOLDER			
029	9940 000 00306	STAND UNIT			
031	9940 000 00243	AM/FM ANT ASS'Y /21/22/25/30			
031	9940 000 00308	AM/FM ANT ASS'Y /37			
032	9940 000 02814	DRIVE BELT			
033	9940 000 02808	DRIVER PULLEY GEAR			
034	9940 000 02807	DRIVING GEAR			
035	9940 000 02832	MOTOR BRACKET			
036	9940 000 02818	DOOR MOTOR PULLY			

ELECTRICAL PARTSLIST

AUX	9940 000 00281	RCA JACK BD 2P	U102	9940 000 00368	IC P87C58X2BBD /21/21M/30/37/79
CF1	9940 000 00245	BAND PASS FILTER /05/12/22/25	U103	9940 000 00251	IC (ROHM) BR24L04
D407	9940 000 00312	VARICAP DIODE /21/30/37/79	U201	9940 000 00365	IC (PHILIPS) SAA7379HL CD-18
D408	9940 000 00312	VARICAP DIODE /21/30/37/79	U202	9940 000 00252	IC MOTOR DRIVER D9259
FS300	9940 000 00588	GLASS FUSE T800MA/250V/21	U301	9940 000 00261	IC (LIBERAL) LM78L05
FS301 △	9940 000 00258	CERAMIC FUSE /22/25/37	U3	9965 100 03649	IC RDS SAA6588T /05/12/22/25
FS301 △	9940 000 00585	FUSE 2A/250V /05/12/21/30	U401	9940 000 01321	IC TEA5757H/V1 /21/30/37/79
FS302 △	9940 000 00259	CERAMIC FUSE /22/25/37	U401	9940 000 01204	IC TEA5762H/V1 /05/12/22/25
FS302 △	9940 000 00586	FUSE 3.15/250V /05/12/21/30/79	U501	9940 000 04366	IC ET8861S
FS303 △	9940 000 00263	FUSE 100MA/250V /05/12	U601	9940 000 00366	IC TEA6321
IC1	9940 000 00277	IC (LIBERAL) LM78L05	U602	9940 000 00249	IC (ROHM) BA4558F
JK401	9940 000 00275	RCA PIN JACK #RCA-125	U603	9940 000 00367	IC (PHILIPS) TFA9842J
JK601	9940 000 00257	PHONE JACK MSJ-2000(ST)	VC402	9940 000 00314	TRIMMER 10PF 6MM
JK602	9940 000 00276	SPK JACK (R/B/R/B)	VC403	9940 000 00254	TRIMMER 10PF 6MM (WH)
LCD501	9940 000 00268	LCD DISPLAY	VR401	9940 000 00313	SEMI FIXED VRB100K 6MM
LED501	9940 000 00266	LED LAMP 3MM (BLUE)	X201	9940 000 00255	CER RESONATOR 8.4672MHZ
LED502	9940 000 00267	LED LAMP 5MM (BLUE)	X101	9965 100 00333	CRYSTAL 6.000MHz +-20PPM
LED503	9940 000 00265	LED LAMP (MICRO)	X1	9965 100 03650	CRYSTAL 4.332MHz HC-49/U /05/12
RF1	9940 000 00256	TUNER (MITSUMI) FE450-G01			
RF1	9940 000 04442	TUNER (MITSUMI) FE450-G11 /22/25/05/12			
RL301	9940 000 00264	RELAY /22/25/05/12			
S501	9940 000 00274	TACT SWITCH TSA-064301-100			
S502	9940 000 00274	TACT SWITCH TSA-064301-100			
S503	9940 000 00274	TACT SWITCH TSA-064301-100			
S504	9940 000 00274	TACT SWITCH TSA-064301-100			
S505	9940 000 00274	TACT SWITCH TSA-064301-100			
S506	9940 000 00274	TACT SWITCH TSA-064301-100			
S507	9940 000 00274	TACT SWITCH TSA-064301-100			
S508	9940 000 00274	TACT SWITCH TSA-064301-100			
S509	9940 000 00274	TACT SWITCH TSA-064301-100			
S510	9940 000 00274	TACT SWITCH TSA-064301-100			
S511	9940 000 00274	TACT SWITCH TSA-064301-100			
S512	9940 000 00274	TACT SWITCH TSA-064301-100			
S513	9940 000 00274	TACT SWITCH TSA-064301-100			
S514	9940 000 00274	TACT SWITCH TSA-064301-100			
SR501	9940 000 00272	OPTIC SENSOR /22			
SR501	9940 000 00325	OPTIC SENSER /21/30/37			
SW601	9940 000 00273	MICRO SWITCH 1120B			
SW601	9965 100 02037	SWITCH DSPP003100-13-0 /MC235B			
SW602	9940 000 00273	MICRO SWITCH 1120B			
SW602	9965 100 02037	SWITCH DSPP003100-13-0 /MC235B			
T302 △	9940 000 00262	TRANSF. EI-28 AC230V /12/22/25			
T302 △	9965 100 03646	TRANSF. EI-28 AC230V /12/05			
U101	9940 000 00253	IC (SAMSUNG) KA7808			
U102	9965 100 18658	IC P89V51RD2FBC W/SW /05/12/22/25			

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

GENERAL SERVICE INFORMATION

INFORMATION :

In course of production, the design of CD Door opening mechanism is changed for reliability improvement. Following parts are changed or added. In the meantime, the CDM is also changed from TPP381 to SANYO DA23Z1. For more detail please refer to page 10-2 of Service Manual 3141 795 30022.

032 9940 000 02814 DRIVE BELT
 033 9940 000 02808 DRIVER PULLEY
 034 9940 000 02807 DRIVING GEAR
 035 9940 000 02832 MOTOR BRACKET
 036 9940 000 02818 DOOR MOTOR PULLEY
 037 9940 000 02815 DC MOTOR 5V
 038 9940 000 02822 CD MECHANISM (SANYO) DA23Z1
 039 9940 000 02816 CD SHOCK ABSORBER(BLACK)
 041 9940 000 02817 CD SHOCK ABSORBER(GREY)
 042 9940 000 04095 FRONT CABINET /22/25
 042 9940 000 04096 FRONT CABINET /21M/30
 042 9940 000 04098 FRONT CABINET /37

The material of the old mechanism no longer be available, if a set of old CD Door design which cannot be repaired due to lack of service parts, we recommend to replace with a new set.

REMARKS :

The new CD Door Opening mechanism has been implemented in production from the following production code respectively onwards.

MC230/21M	LM120518011252
MC230/25	LM120520028432
MC230/22	LM120516005743
MC230/30	LM100522003271
MC235/37	LM120511005324

REVISION LIST

1.0 Manual 3141 785 30020

Initial Service Manual released.

1.1 Manual 3141 785 30021

In this version, the schematics of CD section and Tuner section are added.

- P8-1 : Main Board
- P8-2 : Circuit Diagram-- MCU and Amplifier Part
- P8-3 : Circuit Diagram-- CD Part
- P8-4 : Circuit Diagram-- Tuner Part
- P8-5 to P8-6: PCB Layouts

1.2 Manual 3141 785 30022

In this version, the new gear mechanism and Sanyo CD mechanism are added, refer to the attached picture.

- P10-1 : Exploded View updated
- P10-2 : Mechanical Partslist updated
- P10-3 : General Service Information added

1.3 Manual 3141 785 30023

In this version, the component - crystal 6.0000MH is added.

P10-2B : Electrical Parts List updated.

X101 996510000333 CRYSTAL 6.000MHz +-20PPM

1.4 Manual 3141 785 30024

In this version, MCM235B/79 added.

P10-2B : Electrical Parts List updated.

1.4 Manual 3141 785 30025

In this version, due to one IC production stop, U102 IC will choose alternative part.

on P10-2A & P10-2B: Electrical Parts List updated.

U102 9965 100 18658 IC P89V51RD2FBC W/SW /05/12/22/25 (was 9940 000 00244 IC P89C60X2BBD)