

Service  
Service  
**Service**

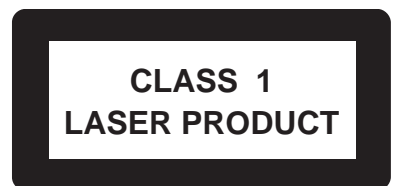


# Service Manual



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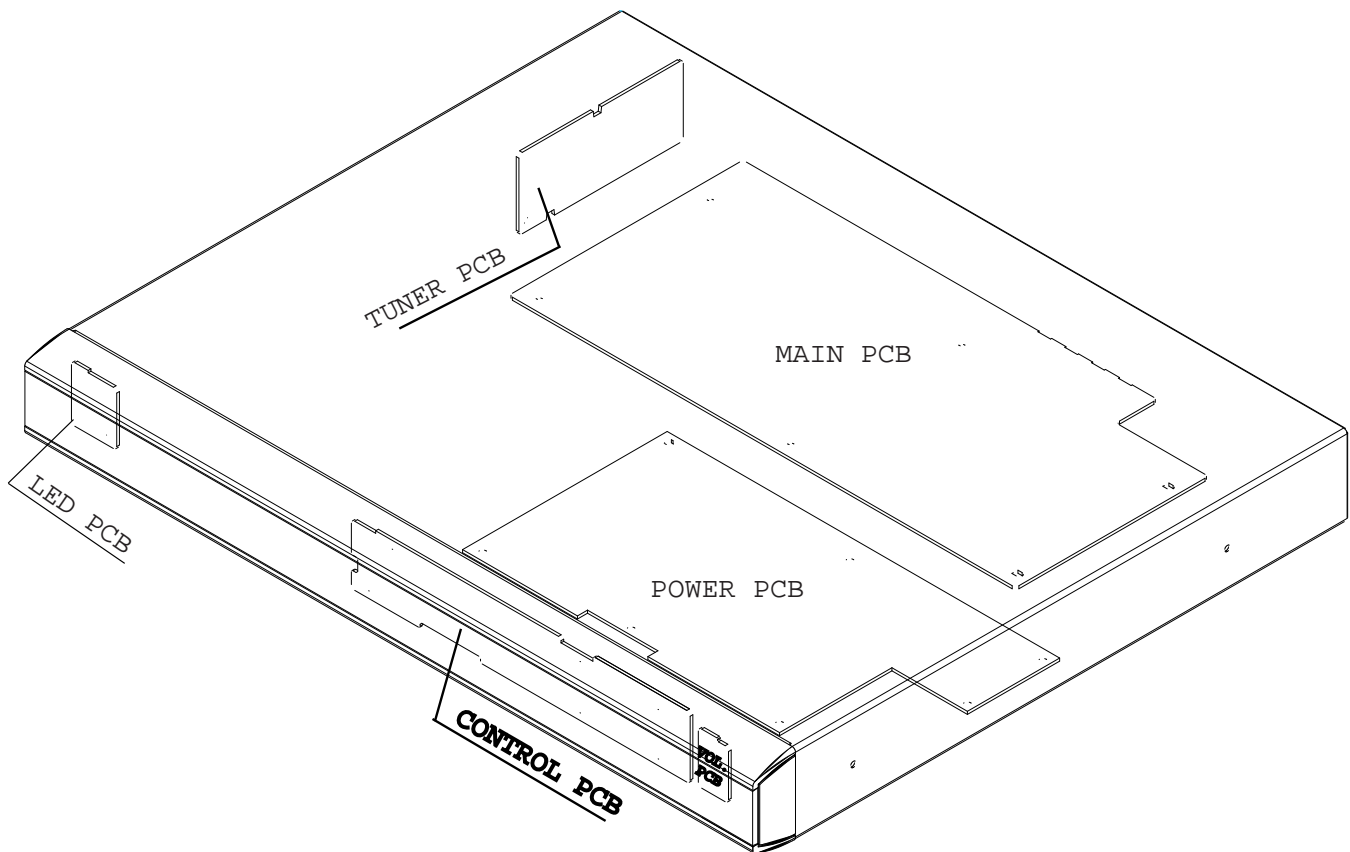
3139 785 30600

Version 1.0



# PHILIPS

## LOCATION OF PC BOARDS



## VERSION VARIATION:

| Type /Versions:                 | MX6050 |
|---------------------------------|--------|
| Features & Board in used:       | / 17   |
| RDS                             |        |
| Rotary Encoder (volume control) | X      |
| Aux Input                       | X      |
| Digital Output                  | X      |
| Line Output                     | X      |
| Progressive scan                | X      |
| Power supply (110V)             | X      |
|                                 |        |

## SPECIFICATIONS

### AMPLIFIER SECTION

|                             |                         |
|-----------------------------|-------------------------|
| Output power .....          | 500 W Total power       |
| - Front .....               | 70 W RMS / channel      |
| .....                       | 60 W FTC®/channel       |
| - Rear .....                | 70 W RMS / channel      |
| - Center .....              | 70 W RMS                |
| - Subwoofer .....           | 100 W RMS               |
| Frequency Response .....    | 180 Hz - 14 kHz / ±3 dB |
| Signal-to-Noise Ratio ..... | > 60 dB (A-weight)      |
| Input Sensitivity           |                         |
| AUX/TV In .....             | 400 mV                  |

① 8ohm, 120Hz-12.5 KHz, 10% THD

### TUNER SECTION

|                                  |                                    |
|----------------------------------|------------------------------------|
| Tuning Range .....               | FM 87.5 – 108 MHz ( 100 kHz steps) |
| .....                            | AM 530 – 1710 kHz (10 kHz steps)   |
| 26 dB Quieting Sensitivity ..... | FM 20 dBf                          |
| 26 dB Quieting Sensitivity ..... | AM 5000 µV/m                       |
| Image Rejection Radio .....      | FM 25 dB                           |
| .....                            | AM 28 dB                           |
| IF Rejection Ratio .....         | FM 60 dB                           |
| .....                            | AM 24 dB                           |
| Signal-to-Noise Ratio .....      | FM 55 dB                           |
| .....                            | AM 40 dB                           |
| AM Suppression Ratio .....       | FM 30 dB                           |
| Harmonic Distortion .....        | FM Mono 3 %                        |
| .....                            | FM Stereo 3 %                      |
| .....                            | AM 5 %                             |
| Frequency Response .....         | FM 180 Hz – 10 kHz / ±6 dB         |
| Stereo Separation .....          | FM 26 dB (1 kHz)                   |
| Stereo Threshold .....           | FM 23.5 dB                         |

### DISC SECTION

|                              |  |
|------------------------------|--|
| Laser Type .....             | Semiconductor                                  |
| Disc Diameter .....          | 12cm / 8cm                                     |
| Video Decoding .....         | MPEG-2 / MPEG-1                                |
| Video DAC .....              | 10 Bits  |
| Signal System .....          | PAL / NTSC                                     |
| Video Format .....           | 4:3 / 16:9                                     |
| Video S/N .....              | 56 dB (minimum)                                |
| Composite Video Output ..... | 1.0 Vp-p, 75 Ω                                 |
| S-Video Output .....         | Y - 1.0 Vp-p, 75 Ω                             |
| .....                        | C - 0.286 Vp-p, 75 Ω                           |
| Audio DAC .....              | 24 Bits / 96 kHz                               |
| Frequency Response .....     | 4 Hz - 20 kHz (44.1kHz)                        |
| .....                        | 4 Hz - 22 kHz (48kHz)                          |
| .....                        | 4 Hz - 44 KHz (96KHz)                          |
| Digital Output .....         |  |
| .....                        | SPDIF (Sony Philips digital interface) Coaxial |
| - PCM .....                  | IEC 60958                                      |
| - Dolby Digital .....        | IEC 60958, IEC 61937                           |

### MAIN UNIT

|                              |                             |
|------------------------------|-----------------------------|
| Power Supply Rating .....    | 120 V / 60 Hz               |
| Power Consumption .....      | 160W                        |
| Dimensions (w × h × d) ..... | 435× 48 × 350 (mm)          |
| .....                        | 17.13 × 1.89 × 13.78 (inch) |
| Weight .....                 | 4.35 kg / 9.57 pounds       |

### SPEAKERS

|                              |                           |
|------------------------------|---------------------------|
| Front/Rear speakers          |                           |
| System .....                 | 2-way, Bass Reflex system |
| Impedance .....              | 4 Ω                       |
| Frequency response .....     | 120 Hz – 20 kHz           |
| Dimensions (w × h × d) ..... | 90 × 230 × 80 (mm)        |
| .....                        | 3.54 × 9.06 × 3.15 (inch) |
| Weight .....                 | 0.835 kg/1.837 pounds     |

### CENTER SPEAKERS

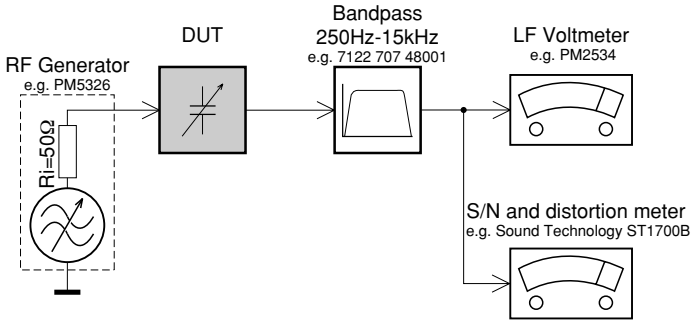
|                              |                             |
|------------------------------|-----------------------------|
| System .....                 | 5 multi direction driver    |
| Impedance .....              | 4 Ω                         |
| speaker drivers .....        | 4 x 3" woofer, 1 3/4" piezo |
| Frequency response .....     | 120 Hz – 20 kHz             |
| Dimensions (w × h × d) ..... | 475 × 72 × 64 (mm)          |
| .....                        | 17.13 × 2.83 × 2.52 (inch)  |
| Weight .....                 | 1.25 kg/2.75 pounds         |

### PASSIVE SUBWOOFER

|                              |                              |
|------------------------------|------------------------------|
| Impedance .....              | 3 Ω                          |
| speaker drivers .....        | 6 1/2" woofer                |
| Frequency response .....     | 30 Hz – 120 kHz              |
| Dimensions (w × h × d) ..... | 300 × 300 × 300 (mm)         |
| .....                        | 11.81 × 11.81 × 11.81 (inch) |
| Weight .....                 | 4.5 kg/9.9 pounds            |

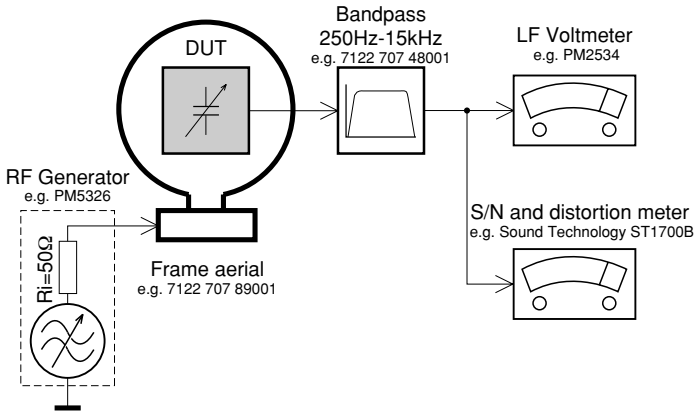
# MEASUREMENT SETUP

## Tuner FM



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

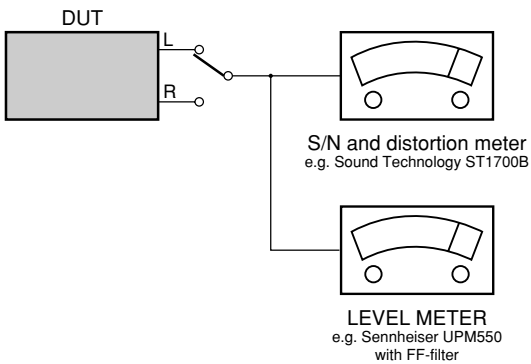
## Tuner AM (MW,LW)



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).

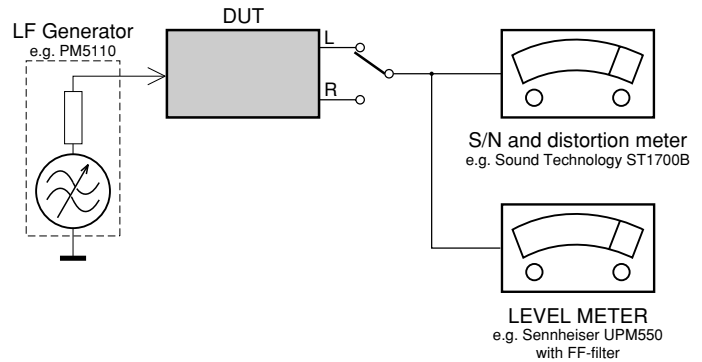
## CD

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

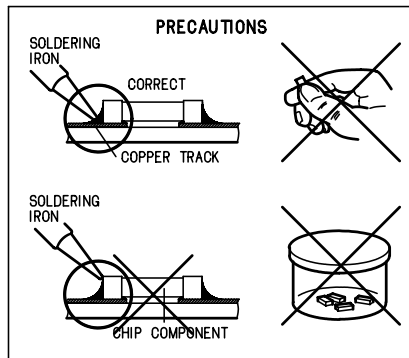
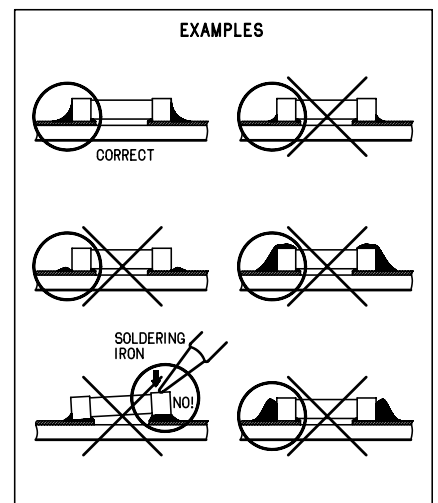
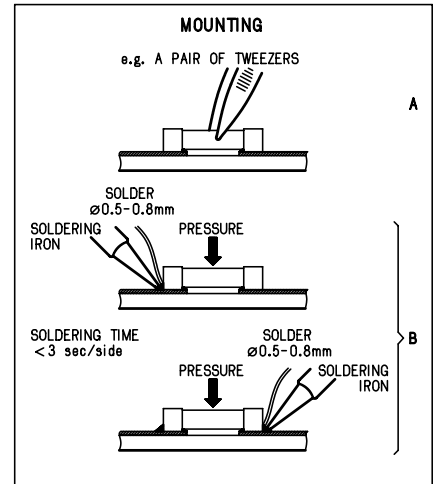
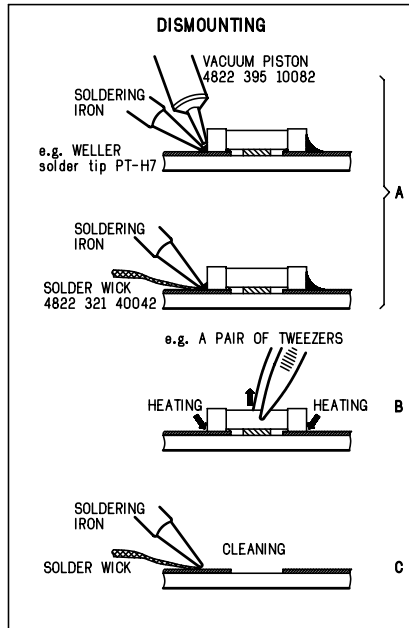
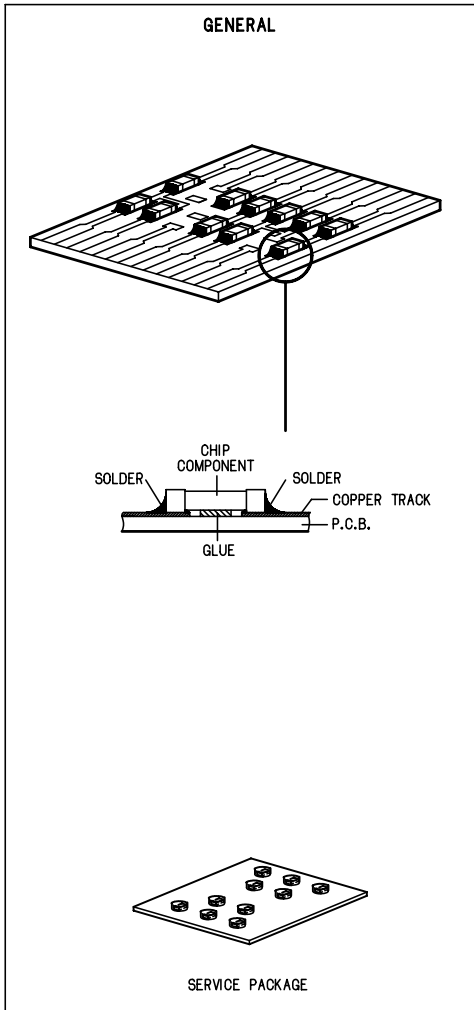
## Service Tools:

- 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

## 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

## 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.

**(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 bracelet serti d'une résistance de sécurité.  
Veiller à ce que les composants ainsi que les outils que l'on utilise soient également à ce potentiel.

**(D) WARNUNG**

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

**(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.

**(I) AVVERTIMENTO**


Tutti IC e parecchi semi-conduttori sono sensibili alle scariche statiche (ESD).  
La loro longevità potrebbe essere fortemente ridotta 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) ESD PROTECTION EQUIPMENT**

Complete Kit ESD3 (small tablemat, wristband, connection box, extension cable and earth cable ..... 4822 310 10671  
Wristband tester ..... 4822 344 13999


**(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 .

**(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 symbol .

**(F)**

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

Les composants de sécurité sont marqués .


**(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  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 .

**(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.

**ESD****(GB) Warning !**

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

**(S) Varning !**

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

**(SF) Varoitus !**

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

**(DK) Advarse !**

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

**(F)**

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

## System, Region code, Tuner, etc. setting procedure

### 1) System Reset

- Press "SYSTEM" button on R/C. TV show "SETUP"
- Select the menu using the "▼" and "▶" button on R/C
- Go feature setup page to do system reset

### 2) Region Code Change

After replacement / repair of the MPEG board, the customer setting and the region code may be lost. Changing the Region code will put the player back in the state which it has left the factory.

#### Region Code

|   |                      |
|---|----------------------|
| 1 | USA                  |
| 2 | EU                   |
| 3 | AP                   |
| 4 | Australia, NZ, Latam |
| 5 | RUSSIA, INDIA        |
| 6 | CHINA                |

#### TV System

|   |      |
|---|------|
| 1 | NTSC |
| 2 | PAL  |
| 3 | AUTO |

#### Menu/ Audio Subtitle (AS) Language

|   |         |
|---|---------|
| 1 | English |
| 2 | English |
| 3 | English |
| 4 | English |

#### AFS

|     |                         |
|-----|-------------------------|
| 001 | LX3000D/LX3500D /MRD200 |
| 002 | MX3600D/MX3800          |
| 003 | LX3700D/LX3750W         |
| 005 | MRD210                  |
| 006 | MX3660D                 |
| 008 | FW-D550                 |
| 010 | MRD120/MX6050           |

#### oem derivative

08

- region code = 1 digit
- tv system = 1 digit
- "as/menu lang" = 1 digit
- "AFS" = "architecture Feature Set" = 3 digits

This field is used to define the architecture / features sets for each product.

- "oem derivative" = 2 digit

This field is used to define the OEM set. This will affect the background display.

Hence in total, reprogramming will be done by way of the remote control. It should run as below :-

- Put the player in stop mode. No disc loaded.
- Press the following key on remote control:

For MX6050 /17 (US) :

<PLAY> <159> <111> <010> <08> <PLAY>

\* After the Region Code is changed it is necessary to reset the system so that the new Region Code will be fully effective. All customer setting will be lost.

\* On top of the maximum number of times allowed for changing the region code is changed to 25.

\* When the counter reaches 25, you will not be able to further change the code until you reset the timer by the Region Code timer reset procedure

### CAUTION !

This information is confidential and may not be distributed. Only a qualified service person should reprogram the Region Code.

### 3) Region code change timer reset

Press below key to reset the timer :

- In DISC source, stop mode and no disc in tray.
- Press R/C "Play -159-PLAY" to reset timer to 25

### 4) Tuner area change

- Press the "OPEN/CLOSE" button to open the set's door
- Press "1" "5" "9" button by using R/C.
- TV Show "TUNER AREA"
- Select the tuner area you want by using the "▼" and "▶" button on R/C, then press "OK" to confirm. TV show "TUNER AREA CHANGED"

If you didn't press it in five seconds, the system will remain original status.

| AREA     | BAND | FREQUENCY ( Hz) |       | STEP( Hz) |
|----------|------|-----------------|-------|-----------|
| USA (17) | FM   | 87.5M           | 108M  | 50K       |
|          | AM   | 531K            | 1602K | 9K        |
|          |      | 530K            | 1710K | 10K       |

Note :-

Please refer to the above different tuner area.

### 5. Video Out Change

- Press "SYSTEM" on R/C button
- Select the menu using the "▼" and "▶" button on R/C
- Go picture setup page select Video out item.

### 6. Password Change

- Press "SYSTEM" on R/C button
  - Select the menu using the "▼" and "▶" button on R/C
  - Go feature setup page select "PASSWORD". TV show "ENTER CODE". Press 4 times of "STOP" button on R/C.
  - Select "PARENTAL" "8 ADULT" on TV.
  - Enter PASSWORD to "1234".
- \* "1234" is a default password supplied.

### 7. Checking on the Software version

- Open the CD door.
- Press "123" and "OK" on the remote control.
- TV will show the version on screen.

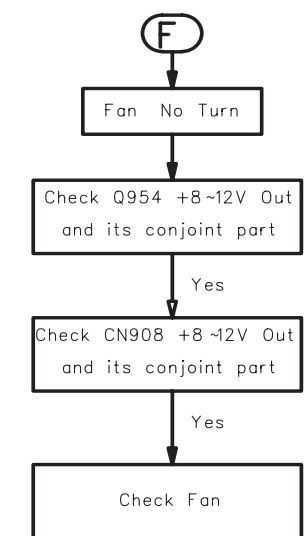
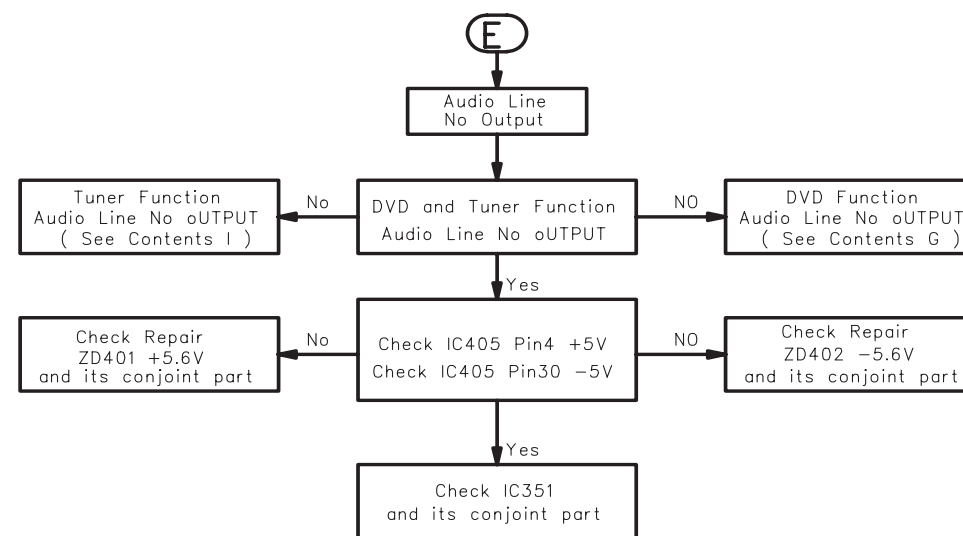
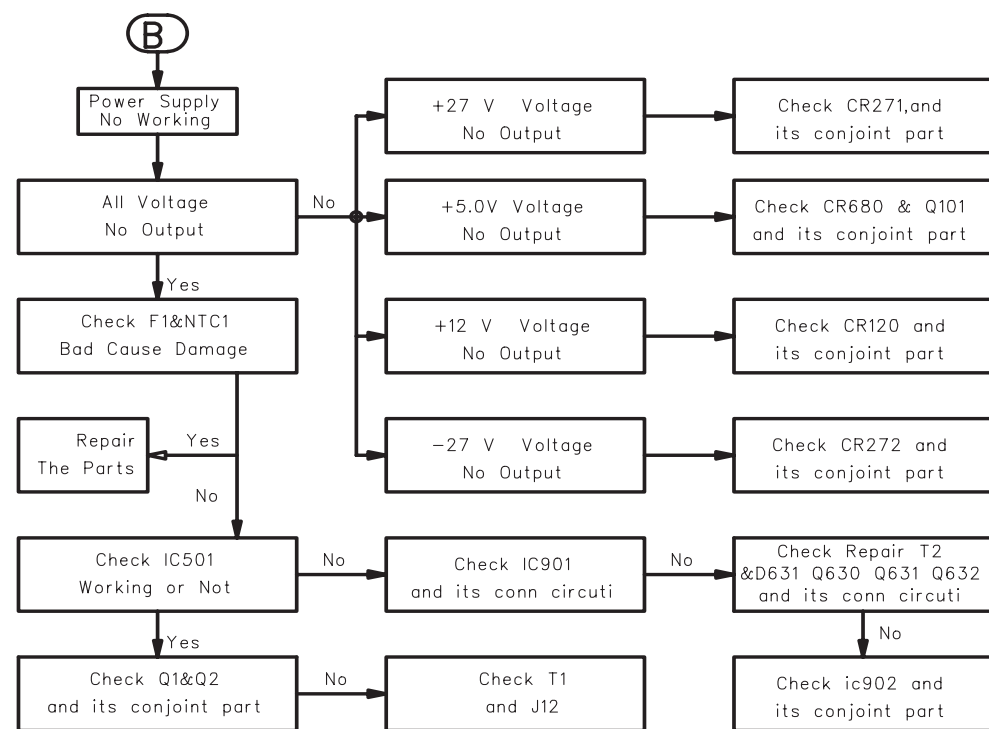
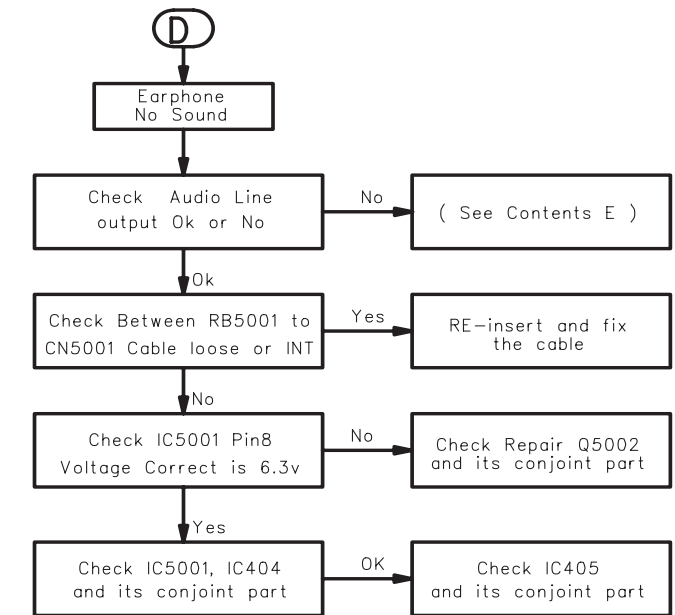
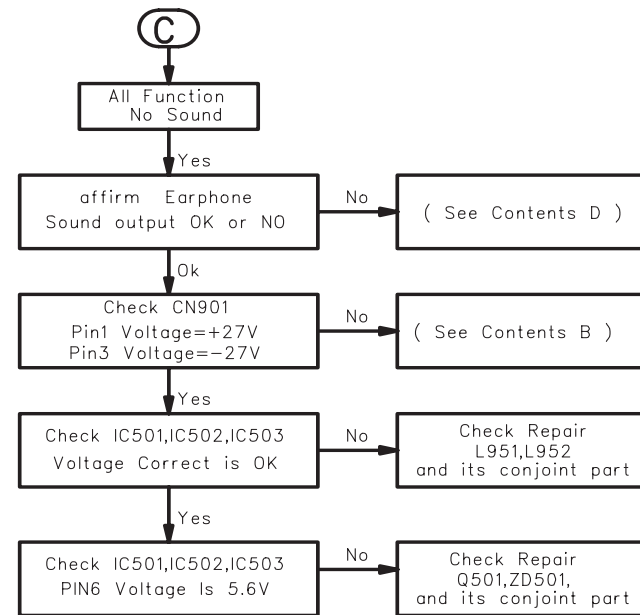
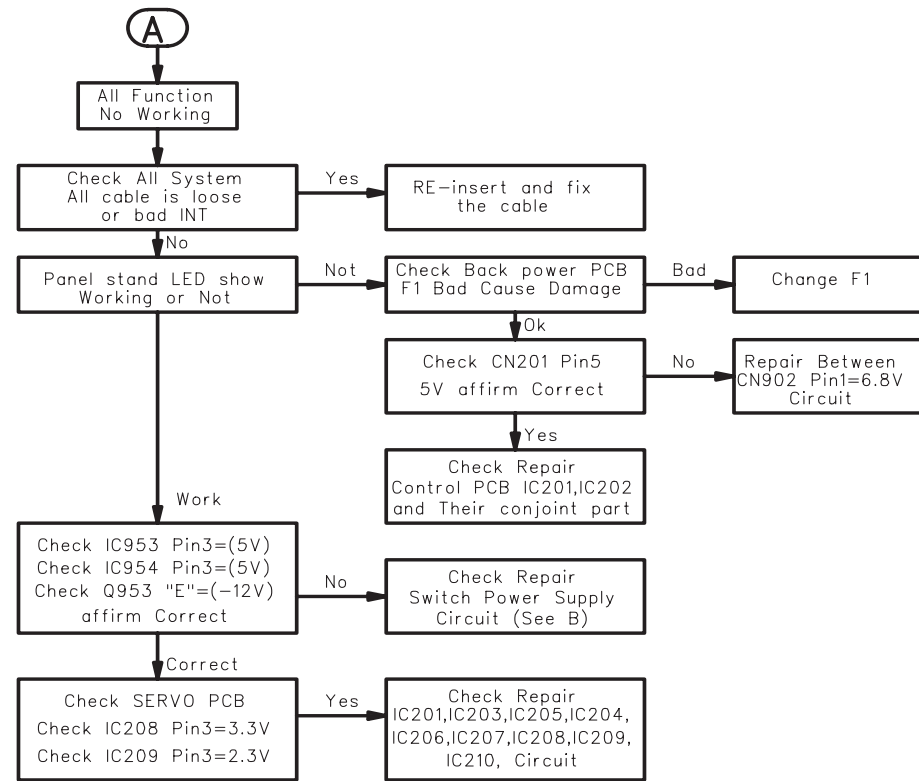
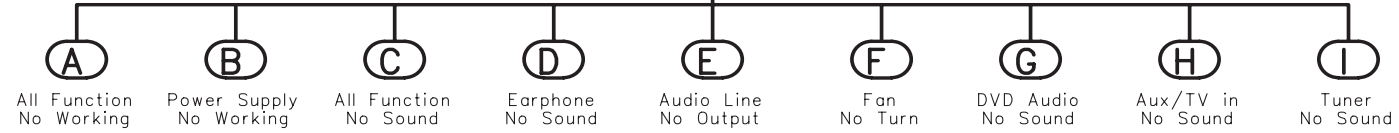
### 8. Upgrading new software

- Open the door, then insert the CD-R program disc.
- Close the door.
- TV will show:-
  - "disc loading"
  - "bank30.rom"
  - "writing" about 6 seconds.
  - "Done"

\* The latest upgraded is in version VER0226.

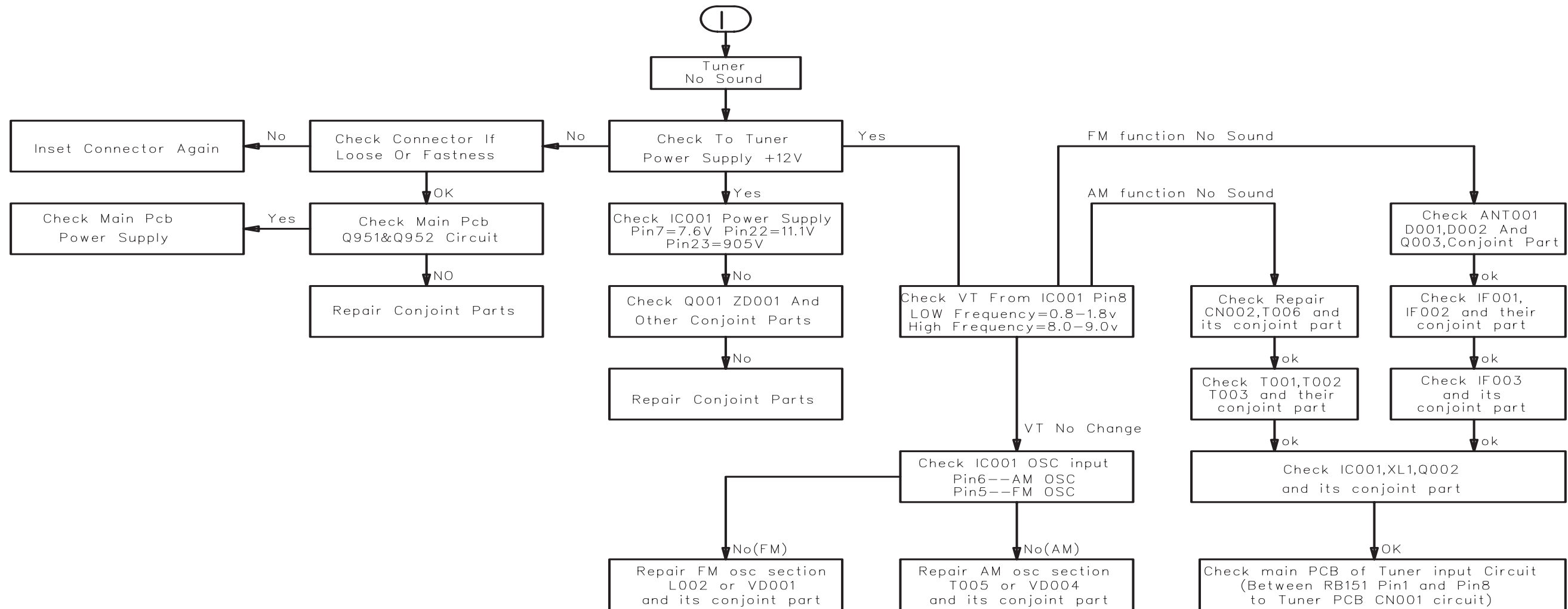
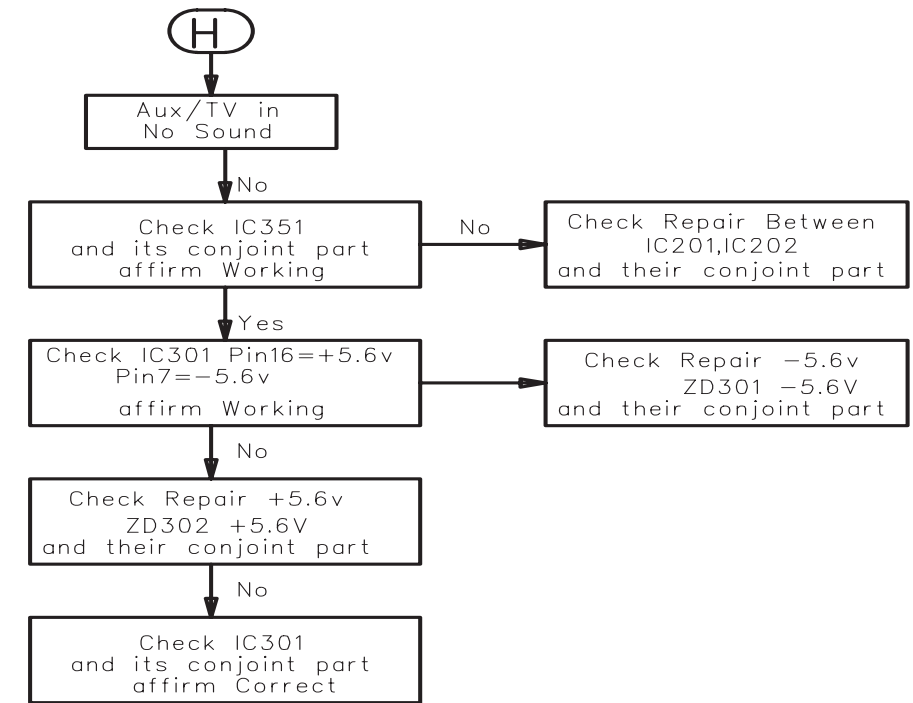
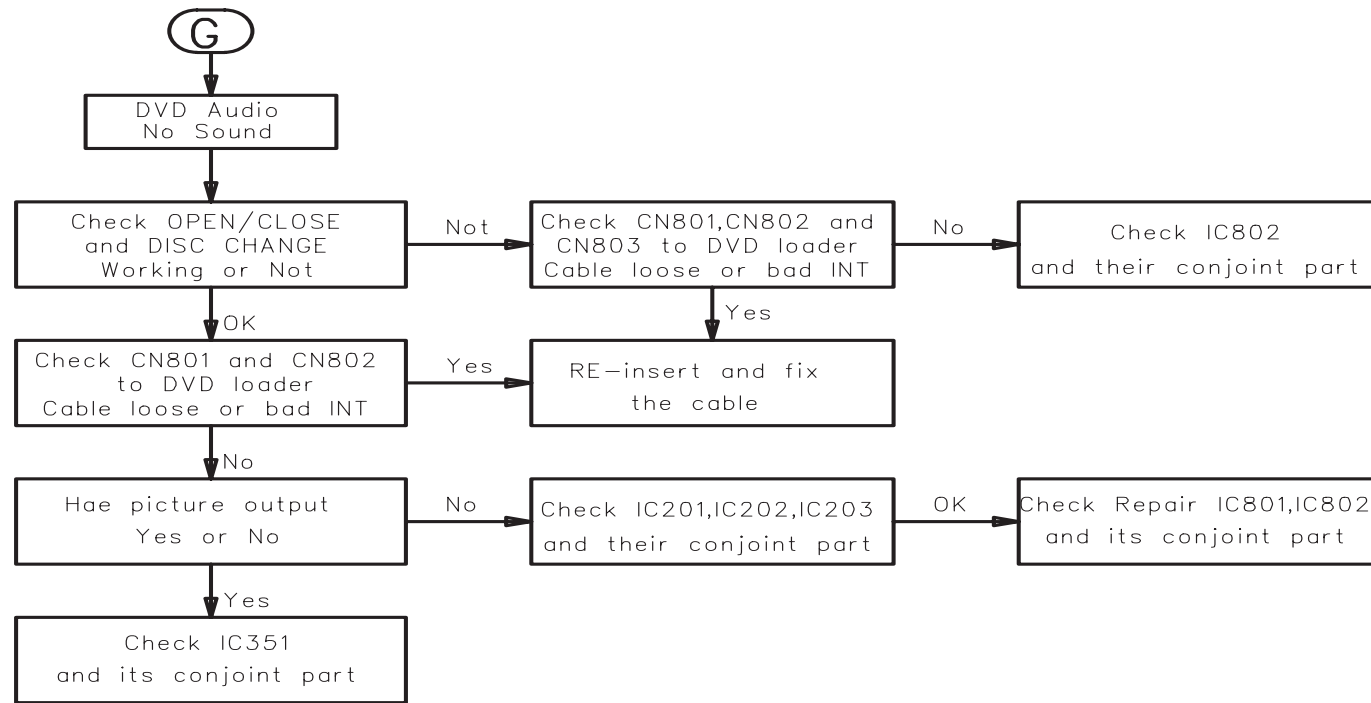
REPAIR INSTRUCTIONS ( 1 of 2)

MAIN UNIT REPAIR CHART





REPAIR INSTRUCTIONS ( 2 of 2)



## DISASSEMBLY INSTRUCTIONS

### ***Dismantling of the Front Panel Assembly***

- 1) Open the DVD Tray by using the Open/Close Button while the Set is ON and disconnect the mains supply after removing the Tray Cover.

*Note: If this is not possible, the DVD Tray has to be open manually.*

Take a mini screw driver about 2mm diameter and make a marking 24mm from the tip as shown in figure 2. place the set on its side, insert the mini screw driver till the marking and slide it towards the right as shown in figure 1 until the Tray moves out of the Front Panel.

- 2) Return the set to its upright position and remove the Tray Cover as shown in Figure 3 and close the tray manually by pushing it back in.

- 3) Loosen 9 screws and remove the Top Cover by lifting the rear portion upwards before sliding it out towards the rear.
  - 5 screws on the back
  - 2 screws each on the left & right side

- 4) Loosen 7 screws & lift up the top edge of Front Panel assembly to free some catches before sliding it out towards the front.
  - 4 screws on the bottom
  - 1 screw "E" on the inside as indicated in Figure 8.
  - 1 screw each on the left & right side

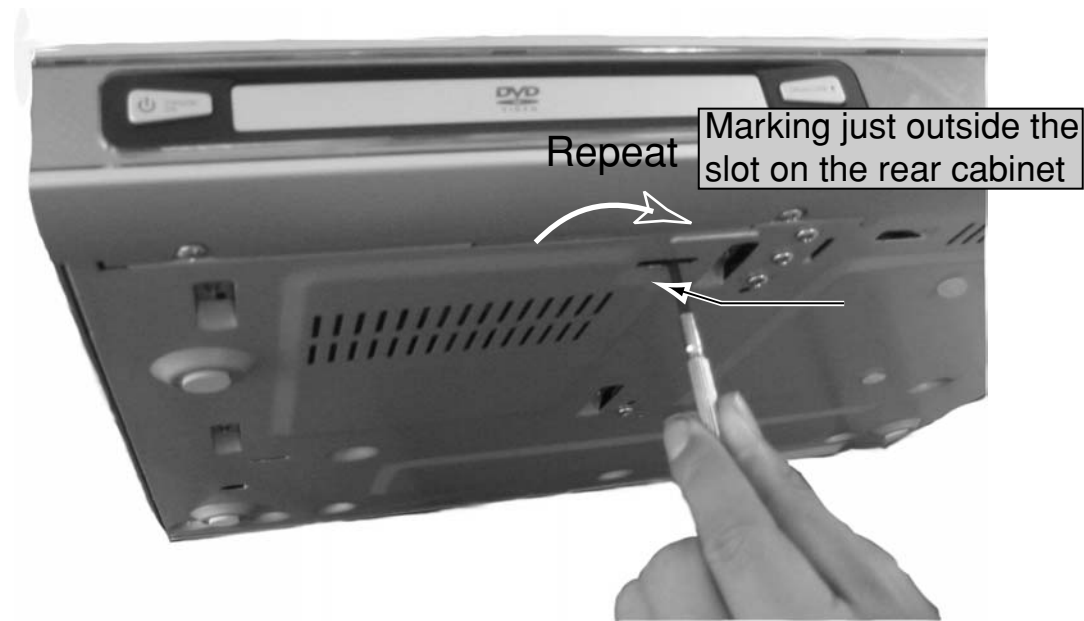


Figure 1



Figure 2

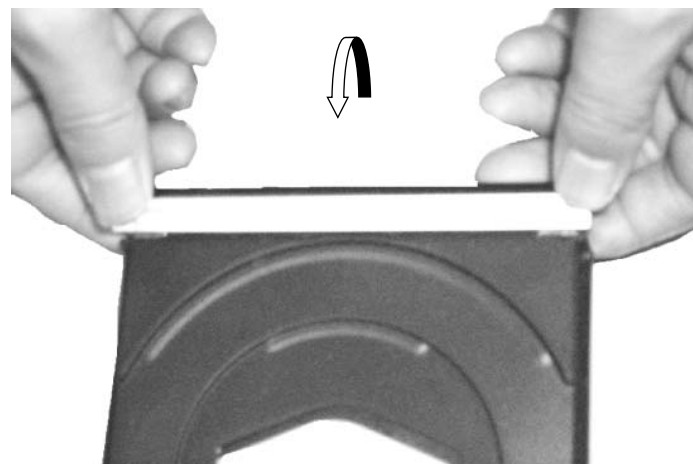


Figure 3

### ***Dismantling of the DVD Module***

- 1) Loosen 4 screws "A" to remove the DVD Module as shown in figure 4.

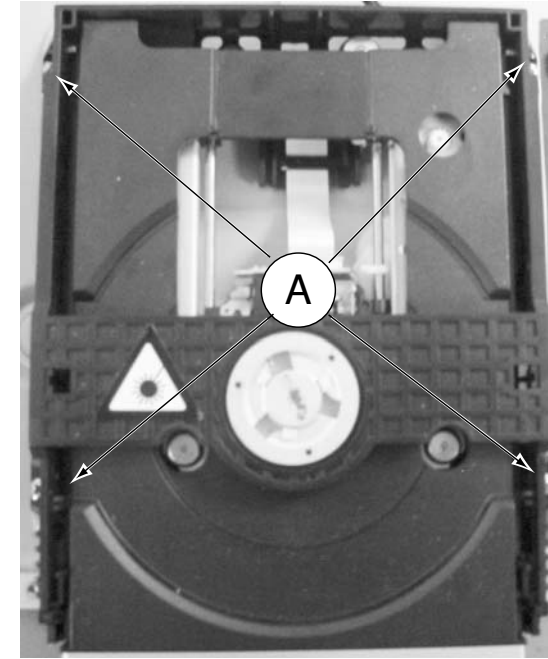


Figure 4

### ***Dismantling of the Power Board***

- 1) Loosen 2 screws "B" on the bottom cover as shown in figure 5.
- 2) Loosen 4 screws "C" at the top of the Power Board as shown in figure 6.

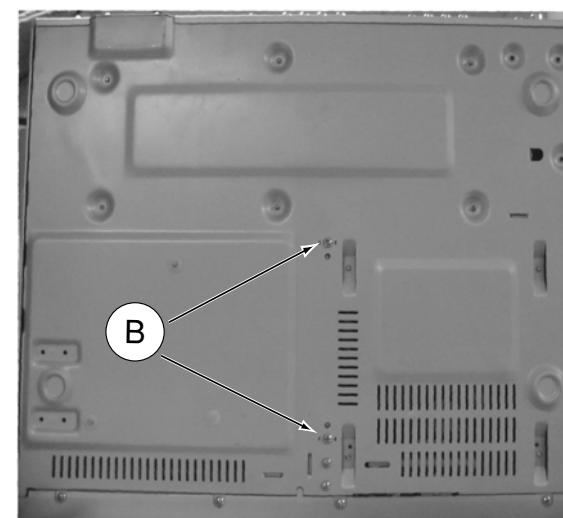


Figure 5

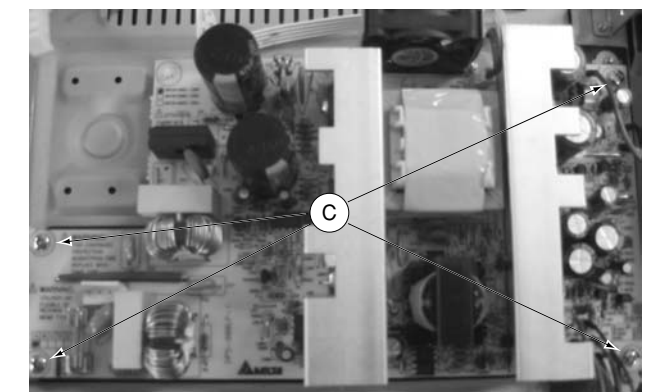


Figure 6

**Dismantling of the Tuner PCB**

- 1) Loosen 10 screw " D " at the back panel as shown in figure 7 .
- 2) Loosen 6 screw " E " on the top of main board as shown in figure 8.

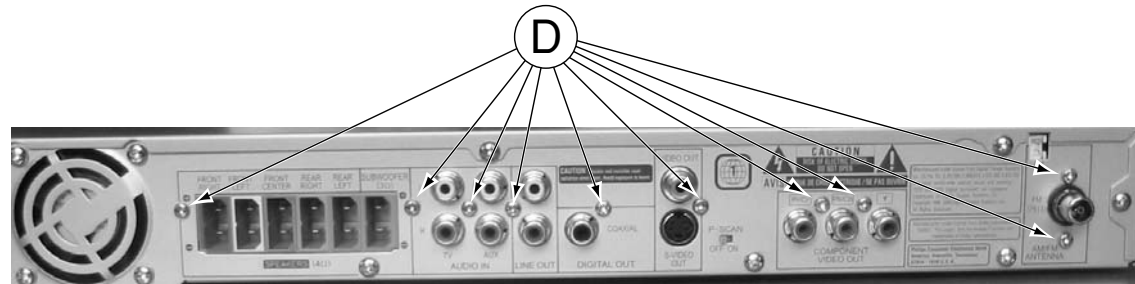


Figure 7

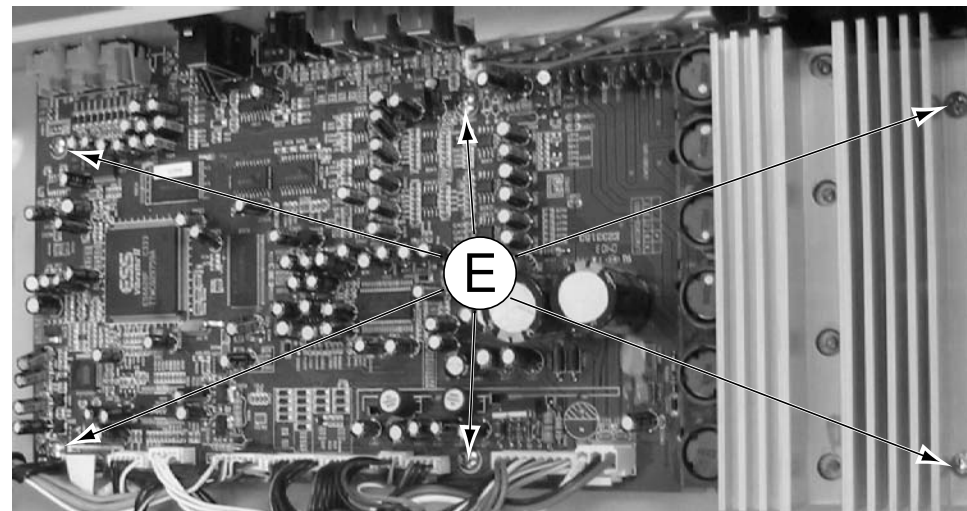


Figure 9

**SERVICE POSITIONS**

Service position A

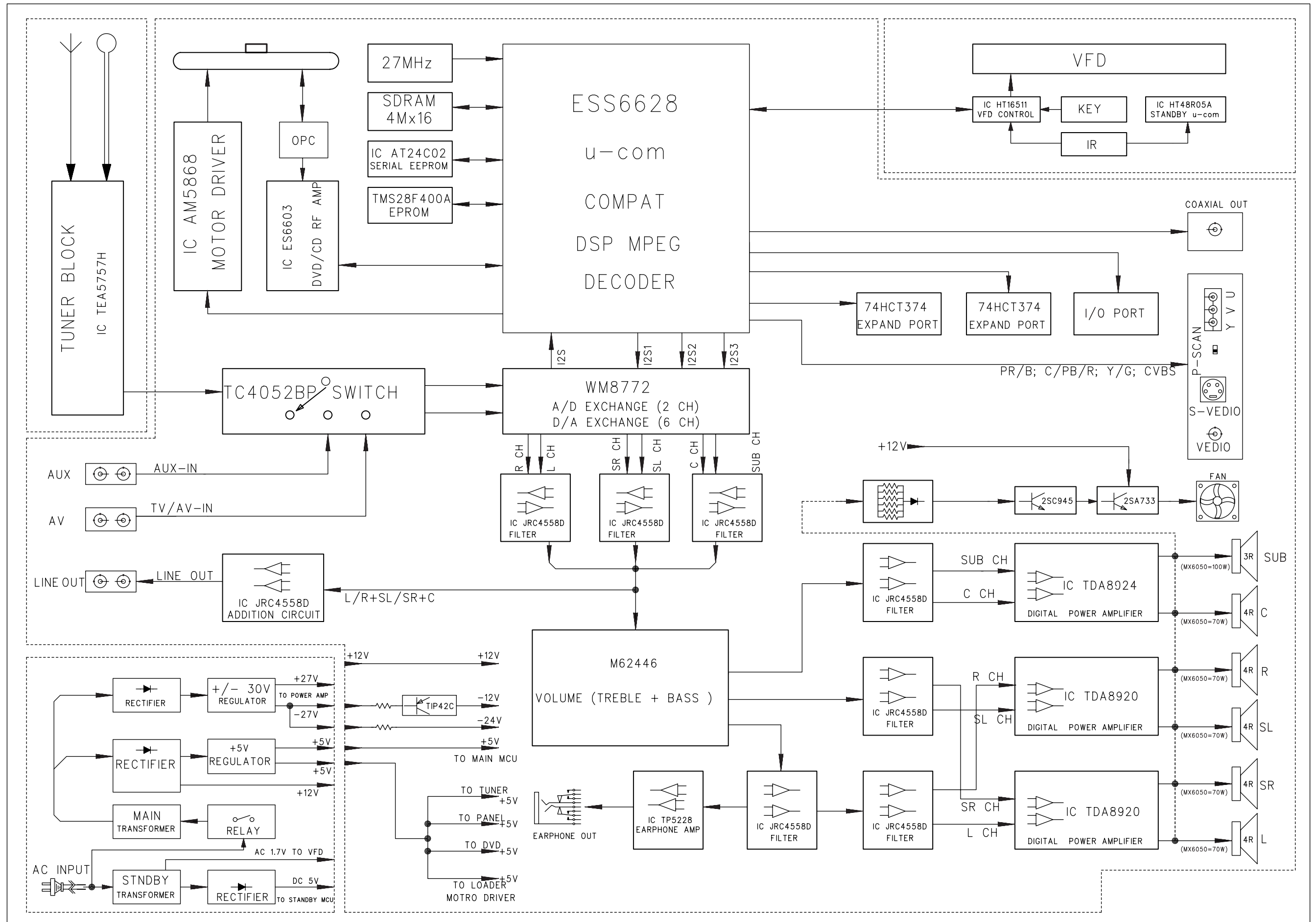


Note: In some service positions the components or copper patterns of one board may risk touching its neighbouring pc boards or metallic parts. To prevent such short-circuit use a piece of hard paper or other insulating material between them.

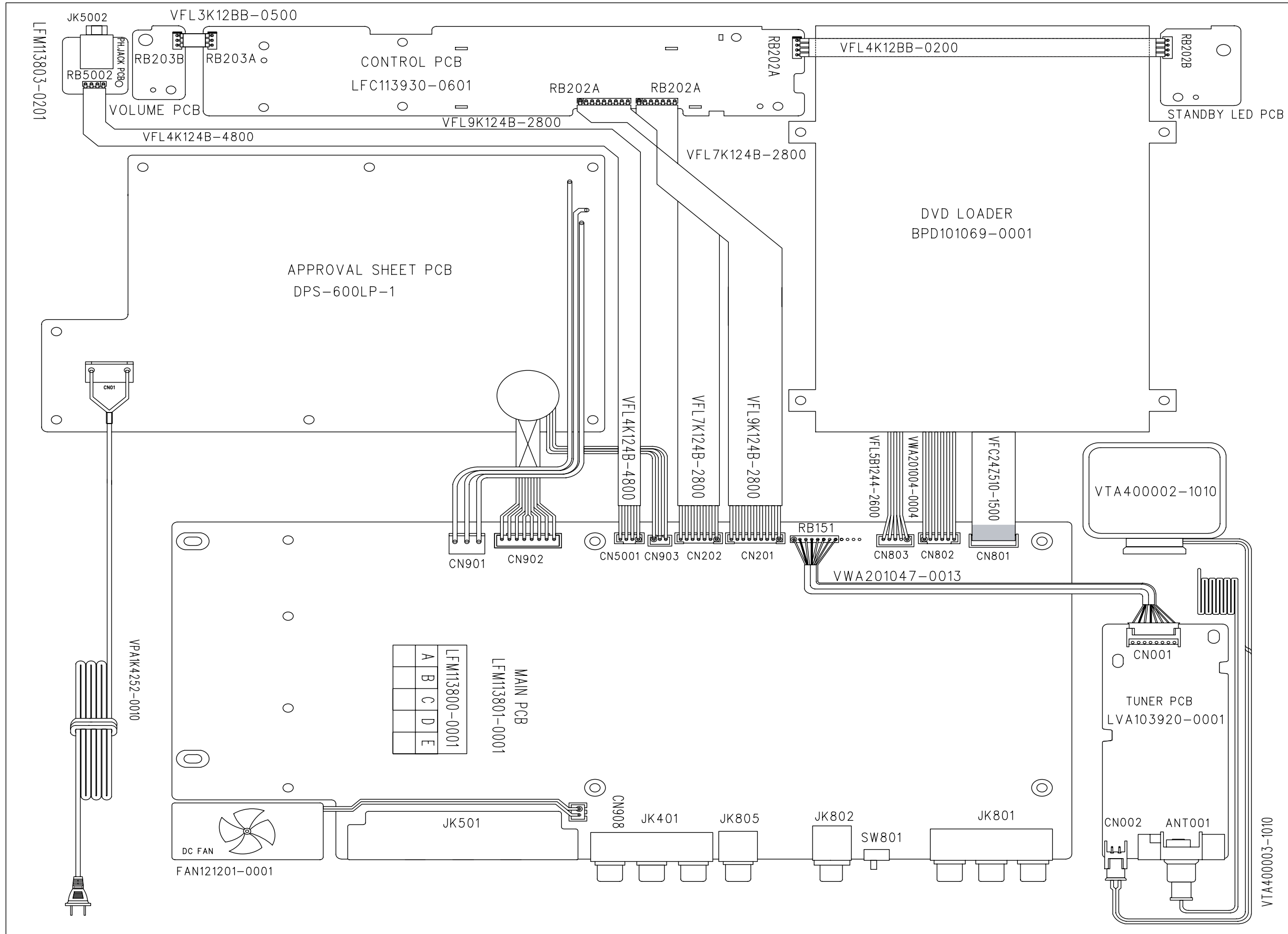
Service position B



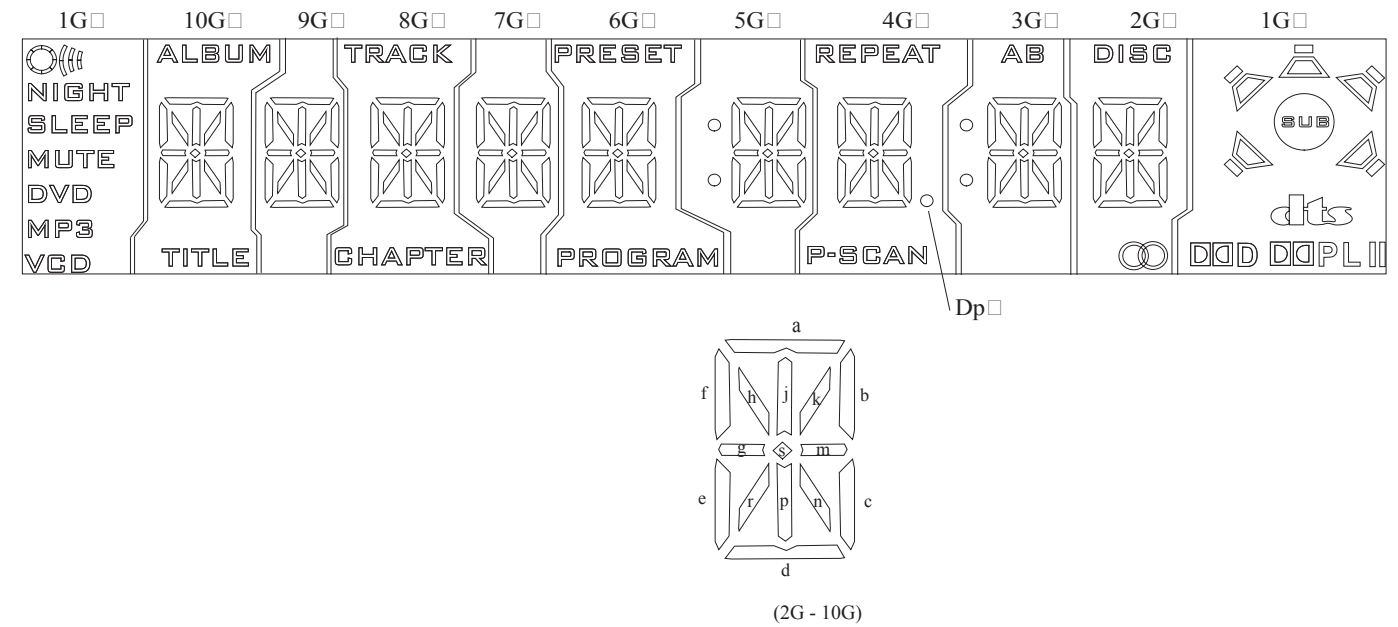
# BLOCK DIAGRAM



# WIRING DIAGRAM



**FTD DISPLAY PIN ASSIGNMENT**



# KEY ( CONTROL / STANDBY / VOL) BOARD

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|     | 10G   | 9G | 8G      | 7G | 6G      | 5G  | 4G     | 3G  | 2G   | 1G    |
|-----|-------|----|---------|----|---------|-----|--------|-----|------|-------|
| P1  | a     | a  | a       | a  | a       | a   | a      | a   | a    |       |
| P2  | b     | b  | b       | b  | b       | b   | b      | b   | b    |       |
| P3  | f     | f  | f       | f  | f       | f   | f      | f   | f    |       |
| P4  | h     | h  | h       | h  | h       | h   | h      | h   | h    |       |
| P5  | j     | j  | j       | j  | j       | j   | j      | j   | j    |       |
| P6  | k     | k  | k       | k  | k       | k   | k      | k   | k    |       |
| P7  | m     | m  | m       | m  | m       | m   | m      | m   | m    |       |
| P8  | s     | s  | s       | s  | s       | s   | s      | s   | s    |       |
| P9  | g     | g  | g       | g  | g       | g   | g      | g   | g    |       |
| P10 | c     | c  | c       | c  | c       | c   | c      | c   | c    |       |
| P11 | e     | e  | e       | e  | e       | e   | e      | e   | e    |       |
| P12 | r     | r  | r       | r  | r       | r   | r      | r   | r    | NIGHT |
| P13 | p     | p  | p       | p  | p       | p   | p      | p   | p    | SLEEP |
| P14 | n     | n  | n       | n  | n       | n   | n      | n   | n    | MUTE  |
| P15 | d     | d  | d       | d  | d       | d   | d      | d   | d    | DVD   |
| P16 |       |    |         |    |         | Col | Dp     | Col |      | MP3   |
| P17 | ALBUM |    | TRACK   |    | PRESET  |     | REPEAT | A   | DISC | V     |
| P18 | TITLE |    | CHAPTER |    | PROGRAM |     | P-SCAN | B   |      | GD    |

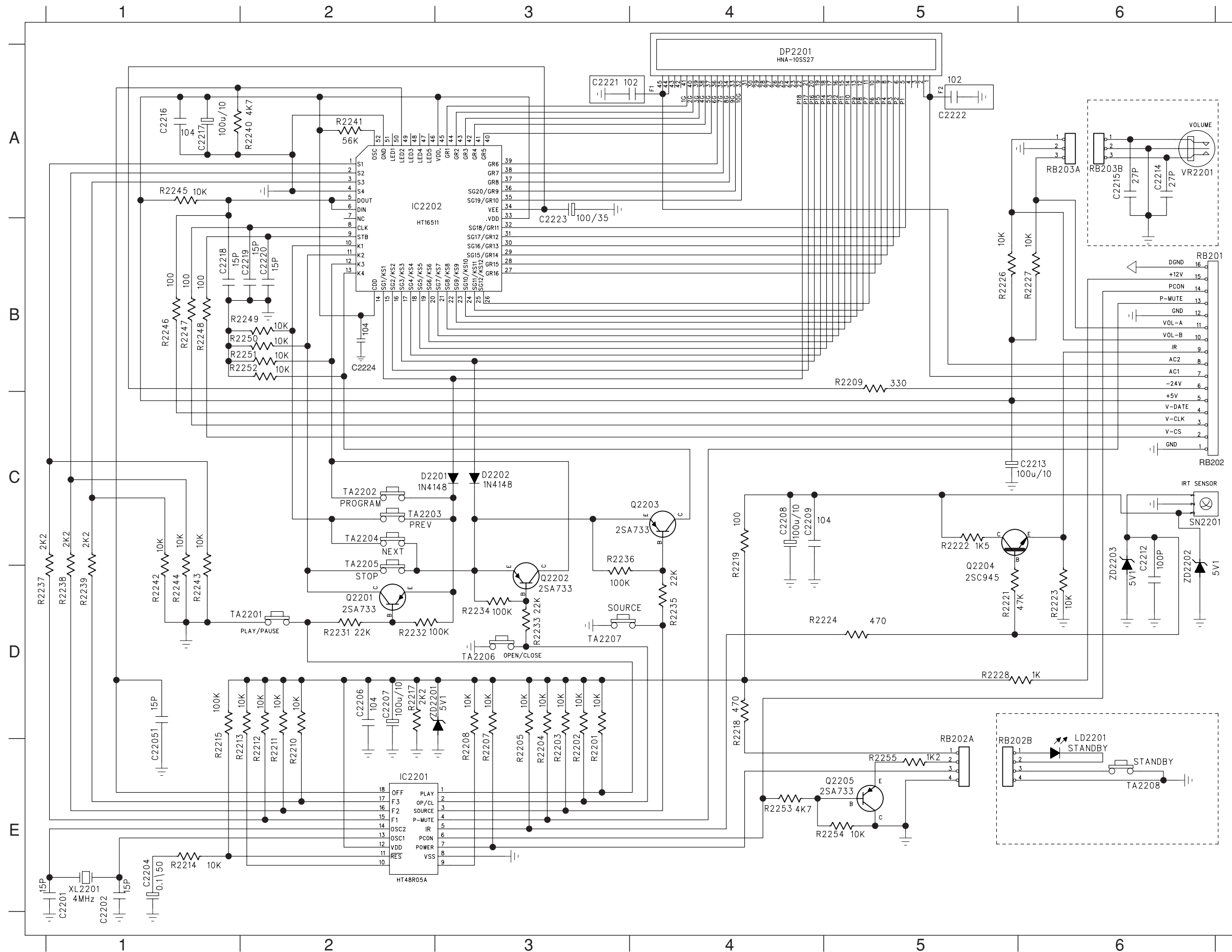
**PIN CONNECTION**

| PIN NO.    | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32  | 31~23 | 22  | 21  | 20  | 19  | 18  | 17  | 16  | 15  | 14  | 13 | 12 | 11 | 10 | 9  | 8  | 7  | 6  | 5  | 4  | 3  | 2  | 1  |
|------------|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| CONNECTION | F2 | F2 | NP | NP | 1G | 2G | 3G | 4G | 5G | 6G | 7G | 8G | 9G | 10G | NX    | P18 | P17 | P16 | P15 | P14 | P13 | P12 | P11 | P10 | P9 | P8 | P7 | P6 | P5 | P4 | P3 | P2 | P1 | NP | NP | F1 | F1 |

**## Note ##**

- 1. Fn: Filament pin
- 2. NP : No Pin
- 3. NX : No Extended Pin
- 4. nG : Grid Pin
- 5. PN : Anode Pin

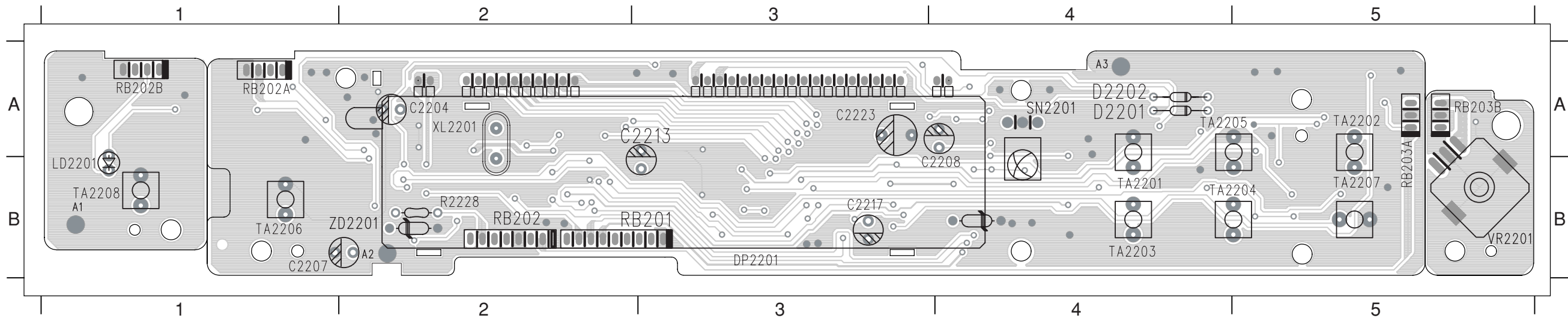
# CIRCUIT DIAGRAM - KEY BOARD



|        |    |        |    |
|--------|----|--------|----|
| C2201  | E1 | R2251  | B2 |
| C2202  | E1 | R2252  | B2 |
| C2204  | E1 | R2253  | E4 |
| C2206  | D2 | R2254  | E5 |
| C2207  | D2 | R2255  | E6 |
| C2208  | C4 | RB201  | B6 |
| C2209  | C4 | RB202  | C6 |
| C2212  | C6 | RB202A | E5 |
| C2213  | C6 | RB202B | E5 |
| C2214  | A6 | RB203A | A6 |
| C2215  | A6 | RB203B | A6 |
| C2216  | A1 | SN2201 | C6 |
| C2217  | A1 | TA2201 | D2 |
| C2218  | B1 | TA2202 | C2 |
| C2219  | B2 | TA2203 | C2 |
| C2220  | B2 | TA2204 | C2 |
| C2221  | A3 | TA2205 | C2 |
| C2222  | A5 | TA2206 | D3 |
| C2223  | A3 | TA2207 | D3 |
| C2224  | B2 | TA2208 | E6 |
| C22051 | D1 | VR2201 | A6 |
| D2201  | C2 | XL2201 | E1 |
| D2202  | C3 | ZD2201 | D2 |
| DP2201 | A4 | ZD2202 | D6 |
| IC2201 | E2 | ZD2203 | D6 |
| IC2202 | A2 |        |    |
| LD2201 | E6 |        |    |
| Q2201  | D2 |        |    |
| Q2202  | D3 |        |    |
| Q2203  | C4 |        |    |
| Q2204  | D5 |        |    |
| Q2205  | E5 |        |    |
| R2201  | E3 |        |    |
| R2202  | E3 |        |    |
| R2203  | E3 |        |    |
| R2204  | E3 |        |    |
| R2205  | E3 |        |    |
| R2207  | E3 |        |    |
| R2208  | E3 |        |    |
| R2209  | B5 |        |    |
| R2210  | E2 |        |    |
| R2211  | E2 |        |    |
| R2212  | E2 |        |    |
| R2214  | E1 |        |    |
| R2215  | D1 |        |    |
| R2217  | D2 |        |    |
| R2218  | D4 |        |    |
| R2219  | C4 |        |    |
| R2221  | D5 |        |    |
| R2222  | C5 |        |    |
| R2223  | D6 |        |    |
| R2224  | D5 |        |    |
| R2226  | B5 |        |    |
| R2227  | B6 |        |    |
| R2228  | D5 |        |    |
| R2231  | D2 |        |    |
| R2232  | D2 |        |    |
| R2233  | D3 |        |    |
| R2234  | D3 |        |    |
| R2235  | D4 |        |    |
| R2236  | C3 |        |    |
| R2237  | D1 |        |    |
| R2238  | D1 |        |    |
| R2239  | D1 |        |    |
| R2240  | A2 |        |    |
| R2241  | A2 |        |    |
| R2242  | D1 |        |    |
| R2243  | D1 |        |    |
| R2244  | D1 |        |    |
| R2245  | A1 |        |    |
| R2246  | B1 |        |    |
| R2247  | B1 |        |    |
| R2248  | B1 |        |    |
| R2249  | B2 |        |    |
| R2250  | B2 |        |    |

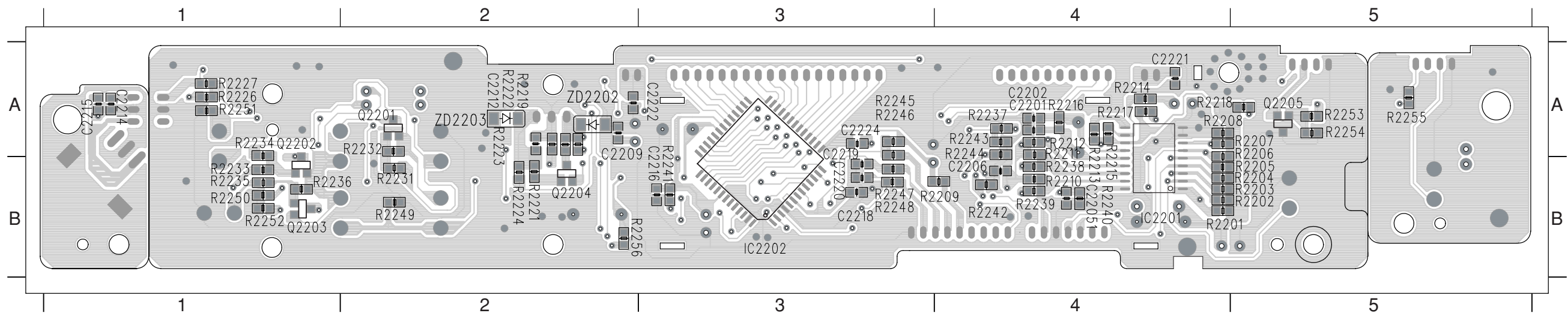
### PCB LAYOUT - KEY BOARD ( TOP )

|       |    |        |    |        |    |        |    |        |    |
|-------|----|--------|----|--------|----|--------|----|--------|----|
| C2204 | A2 | D2201  | A4 | RB202  | B2 | TA2201 | B4 | TA2207 | B5 |
| C2207 | B1 | D2202  | A4 | RB202A | A1 | TA2202 | A5 | TA2208 | B1 |
| C2208 | B4 | DP2201 | B3 | RB202B | A1 | TA2203 | B4 | VR2201 | B5 |
| C2213 | A3 | LD2201 | B1 | RB203A | A5 | TA2204 | B4 | XL2201 | A2 |
| C2217 | B3 | R2228  | B2 | RB203B | A5 | TA2205 | A4 | ZD2201 | B2 |
| C2223 | A3 | RB201  | B3 | SN2201 | A4 | TA2206 | B1 |        |    |



### PCB LAYOUT - KEY BOARD ( BOTTOM )

|              |           |               |           |              |           |              |           |              |           |              |           |              |           |              |           |               |           |
|--------------|-----------|---------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|--------------|-----------|---------------|-----------|
| <b>C2201</b> | <b>A4</b> | <b>C2219</b>  | <b>A3</b> | <b>Q2202</b> | <b>A1</b> | <b>R2207</b> | <b>A5</b> | <b>R2216</b> | <b>A4</b> | <b>R2227</b> | <b>A1</b> | <b>R2239</b> | <b>B4</b> | <b>R2248</b> | <b>B3</b> | <b>ZD2202</b> | <b>A2</b> |
| <b>C2202</b> | <b>A4</b> | <b>C2220</b>  | <b>B3</b> | <b>Q2203</b> | <b>B1</b> | <b>R2208</b> | <b>A4</b> | <b>R2217</b> | <b>A4</b> | <b>R2231</b> | <b>B2</b> | <b>R2240</b> | <b>B4</b> | <b>R2249</b> | <b>B2</b> | <b>ZD2203</b> | <b>A2</b> |
| <b>C2206</b> | <b>B4</b> | <b>C2221</b>  | <b>A4</b> | <b>Q2204</b> | <b>B2</b> | <b>R2209</b> | <b>B4</b> | <b>R2218</b> | <b>A4</b> | <b>R2232</b> | <b>A2</b> | <b>R2241</b> | <b>B3</b> | <b>R2250</b> | <b>B1</b> |               |           |
| <b>C2209</b> | <b>A2</b> | <b>C2222</b>  | <b>A3</b> | <b>Q2205</b> | <b>A5</b> | <b>R2210</b> | <b>B4</b> | <b>R2219</b> | <b>A2</b> | <b>R2233</b> | <b>B1</b> | <b>R2242</b> | <b>B4</b> | <b>R2251</b> | <b>A1</b> |               |           |
| <b>C2212</b> | <b>A2</b> | <b>C2224</b>  | <b>A3</b> | <b>R2201</b> | <b>B4</b> | <b>R2211</b> | <b>A4</b> | <b>R2221</b> | <b>B2</b> | <b>R2234</b> | <b>A1</b> | <b>R2243</b> | <b>A4</b> | <b>R2252</b> | <b>B1</b> |               |           |
| <b>C2214</b> | <b>A1</b> | <b>C22051</b> | <b>B4</b> | <b>R2202</b> | <b>B5</b> | <b>R2212</b> | <b>A4</b> | <b>R2222</b> | <b>A2</b> | <b>R2235</b> | <b>B1</b> | <b>R2244</b> | <b>A4</b> | <b>R2253</b> | <b>A5</b> |               |           |
| <b>C2215</b> | <b>A1</b> | <b>IC2201</b> | <b>B4</b> | <b>R2203</b> | <b>B5</b> | <b>R2213</b> | <b>A4</b> | <b>R2223</b> | <b>A2</b> | <b>R2236</b> | <b>B1</b> | <b>R2245</b> | <b>A3</b> | <b>R2254</b> | <b>A5</b> |               |           |
| <b>C2216</b> | <b>B3</b> | <b>IC2202</b> | <b>B3</b> | <b>R2204</b> | <b>B5</b> | <b>R2214</b> | <b>A4</b> | <b>R2224</b> | <b>B2</b> | <b>R2237</b> | <b>A4</b> | <b>R2246</b> | <b>A3</b> | <b>R2255</b> | <b>A5</b> |               |           |
| <b>C2218</b> | <b>B3</b> | <b>Q2201</b>  | <b>A2</b> | <b>R2205</b> | <b>B5</b> | <b>R2215</b> | <b>A4</b> | <b>R2226</b> | <b>A1</b> | <b>R2238</b> | <b>B4</b> | <b>R2247</b> | <b>B3</b> | <b>R2256</b> | <b>B2</b> |               |           |





**ELECTRICAL PARTS LIST - KEY (CONTROL/STANDBY/VOL) BOARD**

MISCELLANEOUS

|        |                |                               |
|--------|----------------|-------------------------------|
| DP2201 | 9965 000 18031 | VFD 100X25MM                  |
| LD2201 | 9965 000 17400 | LED 3 DIA RED ROUND           |
| TA2201 | 4822 276 13648 | AI TACT SW                    |
| TA2202 | 4822 276 13648 | AI TACT SW                    |
| TA2203 | 4822 276 13648 | AI TACT SW                    |
| TA2204 | 4822 276 13648 | AI TACT SW                    |
| TA2205 | 4822 276 13648 | AI TACT SW                    |
| TA2206 | 4822 276 13648 | AI TACT SW                    |
| TA2207 | 4822 276 13648 | AI TACT SW                    |
| VR2201 | 9965 000 23589 | ENCODER L20 A=12 WITHOUT CC   |
| XL2201 | 9965 000 23590 | CRYSTAL 4MHZ HC-49US +/-15PPM |

DIODES

|        |                |                         |
|--------|----------------|-------------------------|
| D2201  | 4822 130 30621 | 1N4148                  |
| D2202  | 4822 130 30621 | 1N4148                  |
| SN2201 | 9965 000 23591 | IRT RECEIV IRM-2038F4   |
| ZD2201 | 4822 130 34233 | BZX79-B5V1              |
| ZD2202 | 9965 000 19397 | CHIP ZENER 5.6V 5% 0.5W |
| ZD2203 | 9965 000 19397 | CHIP ZENER 5.6V 5% 0.5W |

TRANSISTORS & INTEGRATED CIRCUITS

|        |                |                                |
|--------|----------------|--------------------------------|
| Q2201  | 9965 000 14175 | 2SA733Q,P                      |
| Q2202  | 9965 000 14175 | 2SA733Q,P                      |
| Q2203  | 9965 000 14175 | 2SA733Q,P                      |
| Q2204  | 9965 000 20268 | XISTR NPN SMT TYPE (2SC1623)   |
| Q2205  | 9965 000 14175 | 2SA733Q,P                      |
| IC2201 | 9965 000 23592 | IC 18PIN HT48R05A-1 SOP HOLTEK |
| IC2202 | 9965 000 23593 | IC 52PIN HT16511 QFP HOLTEK    |

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

**VOLTAGES**

| IC2201 (HT480051) |     |     |     |   |     |   |     |   |   |     |     |     |    |    |    |    |    |    |  |  |
|-------------------|-----|-----|-----|---|-----|---|-----|---|---|-----|-----|-----|----|----|----|----|----|----|--|--|
| PIN               | 1   | 2   | 3   | 4 | 5   | 6 | 7   | 8 | 9 | 10  | 11  | 12  | 13 | 14 | 15 | 16 | 17 | 18 |  |  |
| VOLTAGE           | 5.1 | 5.1 | 5.1 | 0 | 5.1 | 0 | 5.1 | 0 | 0 | 4.9 | 4.9 | 5.2 | 0  | 0  | 0  | 0  | 0  | 0  |  |  |

| IC2202 (PT16511) |       |       |       |       |       |     |       |     |       |       |       |       |      |       |       |       |       |       |       |       |
|------------------|-------|-------|-------|-------|-------|-----|-------|-----|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| PIN              | 1     | 2     | 3     | 4     | 5     | 6   | 7     | 8   | 9     | 10    | 11    | 12    | 13   | 14    | 15    | 16    | 17    | 18    | 19    | 20    |
| VOLTAGE          | 0     | 0     | 0     | 0     | 3.8   | 3.8 | 0     | 3.8 | 3.7   | 0     | 0     | 0     | 0    | 0     | 19.7  | -22.2 | -22   | -11.2 | -19.9 | -17.8 |
| PIN              | 21    | 22    | 23    | 24    | 25    | 26  | 27    | 28  | 29    | 30    | 31    | 32    | 33   | 34    | 35    | 36    | 37    | 38    | 39    | 40    |
| VOLTAGE          | -21   | -15.6 | -13.4 | -20   | -13.4 | -20 | -22.4 | -18 | -20.3 | -13.6 | -15.8 | -11.4 | -4.6 | -22.6 | -20.4 | -20.4 | -20.4 | -20.4 | -20.4 | -20.4 |
| PIN              | 41    | 42    | 43    | 44    | 45    | 46  | 47    | 48  | 49    | 50    | 51    | 52    |      |       |       |       |       |       |       |       |
| VOLTAGE          | -20.4 | -20.4 | -20.5 | -20.4 | 4.6   | 4.6 | 4.6   | 4.6 | 0     | 4.6   | 0     | 4.6   |      |       |       |       |       |       |       |       |

| Q2201 (2SA733) |   |   |   |
|----------------|---|---|---|
| PIN            | 1 | 2 | 3 |
| VOLTAGE        | 5 | 0 | 5 |

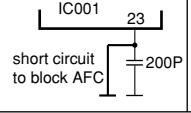
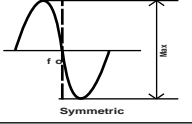

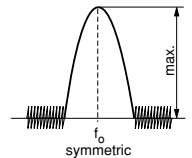
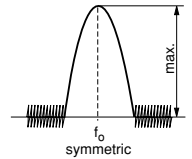
| Q2202 (2SA733) |   |   |   |
|----------------|---|---|---|
| PIN            | 1 | 2 | 3 |
| VOLTAGE        | 5 | 0 | 5 |

| Q2203 (2SA733) |   |   |   |
|----------------|---|---|---|
| PIN            | 1 | 2 | 3 |
| VOLTAGE        | 5 | 0 | 5 |

| Q2204 (2SC1623) |     |     |     |
|-----------------|-----|-----|-----|
| PIN             | 1   | 2   | 3   |
| VOLTAGE         | 4.6 | 4.2 | 4.2 |

| Q2205 (2SA733) |   |   |   |
|----------------|---|---|---|
| PIN            | 1 | 2 | 3 |
| VOLTAGE        | 5 | 0 | 5 |

**TUNER ADJUSTMENT TABLE**

| Waverange   | Input f requency   | Input   | Tuned to  | Adj ust              | Output | Scope/Voltmeter   |
|---|--|---|---|----------------------|--------|---|
| <i>VARICAP ALIGNMENT</i>  |  |   |   |                      |        |   |
| <b>FM</b><br>87.5 - 108MHz<br>(50kHz grid)                      |  |   | 108MHz  | check                |        | 6.5V ±0.2V  |
|   |  |   | 87.5MHz   | check                |        | 1.0V ±0.5V  |
| <b>AM</b><br>530-1710kHz<br>(10kHz grid)<br>( 21L / 21L / 37S ) |  |   | 1602KHz   | check                |        | 7.8V ±0.2V  |
|   |  |   | 531KHz  | T005                 |        | 1.1V ±0.5V  |
|   |  |   | 1700KHz   | check                |        | 8.0V ±0.1HV   |
|   |  |   | 530KHz  | T005                 |        | 1.1V ±0.2V  |
| <i>FM - IF</i>  |  |   |   |                      |        |   |
| <b>FM</b>   | 10.7MHz, 50mV<br>continuous wave   |   |    | No need<br>to adjust |        |    |
| <i>FM - RF</i>  |  |   |   |                      |        |   |
| <b>FM</b>   | 108MHz   |   | 106MHz  | VC001                | MAX    | MAX   |
|   | 87.5MHz  | mod=1kHz<br>$\Delta f = \pm 2.5\text{kHz}$                      | 90.1MHz   | L001                 |        |   |
| <i>AM IF</i>  |  |   |   |                      |        |   |
| <b>AM</b>   | 450kHz   |   |  | T001<br>T002         | MAX    |  |
| <b>AM AFC</b><br><b>MW</b>                                      | Connect pin 29 of<br>IC001 (AM Osc.)<br>with short wire to<br>ground (pin 6) | $\Delta f = \pm 5\text{kHz}$<br>$V_{RF} = 3\text{mV}$           |   | T003                 |        |   |
|   |  | $\Delta V = \text{mV}$  |   |                      |        |   |
| <i>AM RF <sup>3)</sup></i>                                      |  |   |   |                      |        |   |
| <b>MW</b>   | 1404kHz  |   | 1404kHz   | VC001                | MAX    |  |
|   | 576kHz   |   | 612kHz  | T006                 |        |   |
|   | 1400kHz  | $\Delta f = \pm 30\text{kHz}$<br>$V_{RF}$ as low as<br>possible | 1400kHz   | VC002                |        |   |
|   | 610kHz   |   | 610kHz  | T006                 |        |   |

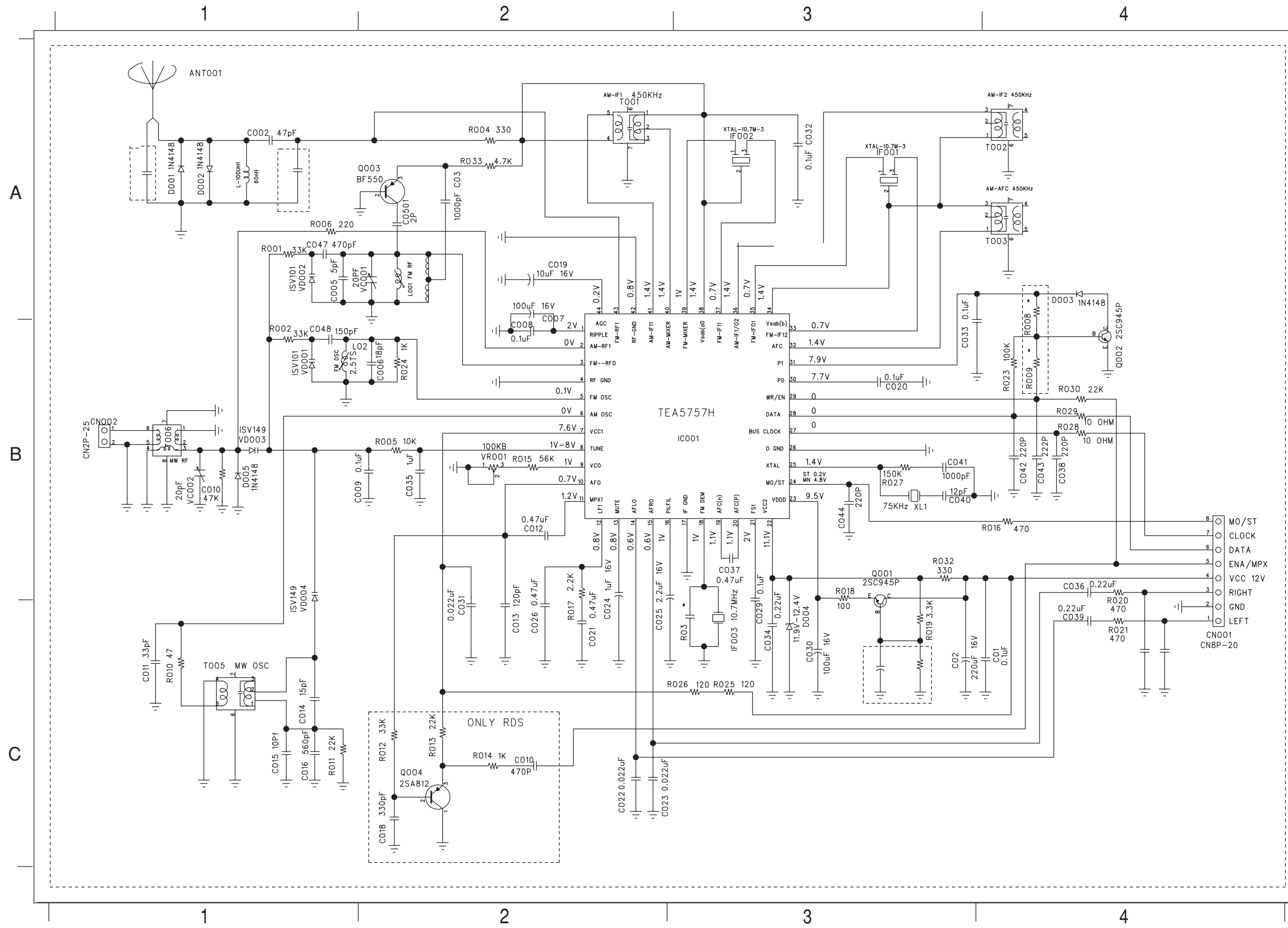
# TUNER BOARD

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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!

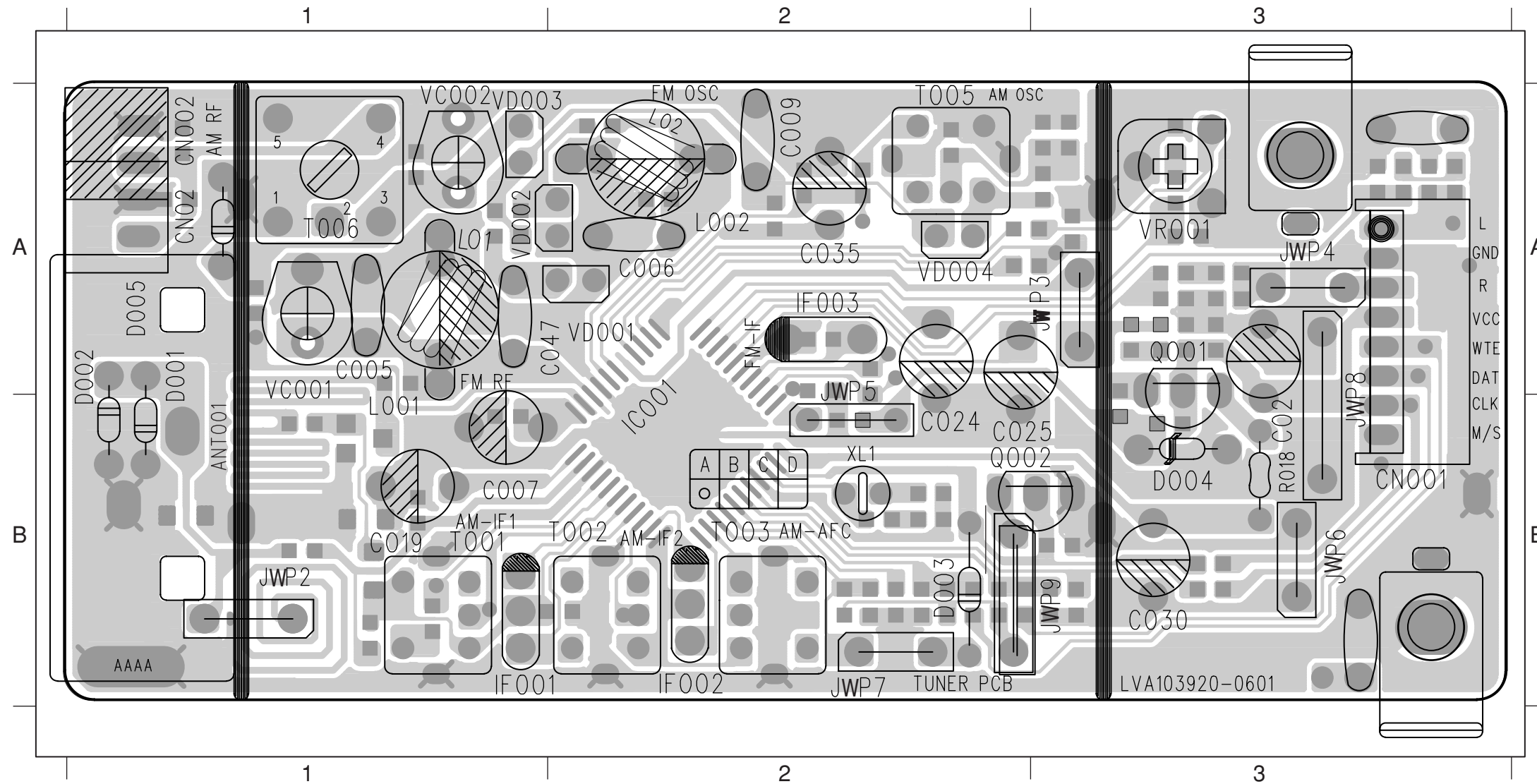
# CIRCUIT DIAGRAM - TUNER BOARD



|        |    |       |    |
|--------|----|-------|----|
| ANT001 | A1 | R004  | A2 |
| C002   | A1 | R005  | B2 |
| C005   | A1 | R006  | A1 |
| C007   | A2 | R010  | C1 |
| C006   | B2 | R011  | C1 |
| C008   | B2 | R015  | B2 |
| C009   | B2 | R016  | B4 |
| C01    | C4 | R017  | C2 |
| C02    | C3 | R018  | B3 |
| C03    | A2 | R019  | C3 |
| C010   | B1 | R020  | B4 |
| C011   | C1 | R021  | C4 |
| C012   | B2 | R023  | B4 |
| C013   | C2 | R024  | B2 |
| C014   | C1 | R025  | C3 |
| C015   | C1 | R026  | C3 |
| C016   | C1 | R027  | B3 |
| C019   | A2 | R028  | B4 |
| C020   | B3 | R029  | B4 |
| C021   | C2 | R030  | B4 |
| C022   | C2 | R032  | B3 |
| C023   | C2 | R033  | A2 |
| C024   | C2 | T001  | A2 |
| C025   | C2 | T002  | A4 |
| C026   | C2 | T003  | A4 |
| C029   | C3 | T005  | C1 |
| C030   | C3 | T006  | B1 |
| C031   | C2 | VC001 | A2 |
| C032   | A3 | VC002 | B1 |
| C033   | B3 | VD001 | B1 |
| C034   | C3 | VD002 | A1 |
| C035   | B2 | VD003 | B1 |
| C036   | B4 | VD004 | C1 |
| C037   | B3 | VR001 | B2 |
| C038   | B4 | XL1   | B3 |
| C039   | C4 |       |    |
| C040   | B3 |       |    |
| C041   | B3 |       |    |
| C042   | B4 |       |    |
| C043   | B4 |       |    |
| C044   | B3 |       |    |
| C047   | A1 |       |    |
| C048   | B1 |       |    |
| C0501  | A2 |       |    |
| CN001  | C4 |       |    |
| CN002  | B1 |       |    |
| D001   | A1 |       |    |
| D002   | A1 |       |    |
| D003   | A4 |       |    |
| D004   | C3 |       |    |
| D005   | B1 |       |    |
| IC001  | B3 |       |    |
| IF001  | A3 |       |    |
| IF002  | A3 |       |    |
| IF003  | C3 |       |    |
| L02    | B1 |       |    |
| L001   | A2 |       |    |
| Q001   | B3 |       |    |
| Q002   | B4 |       |    |
| Q003   | A2 |       |    |
| R001   | A1 |       |    |
| R002   | B1 |       |    |

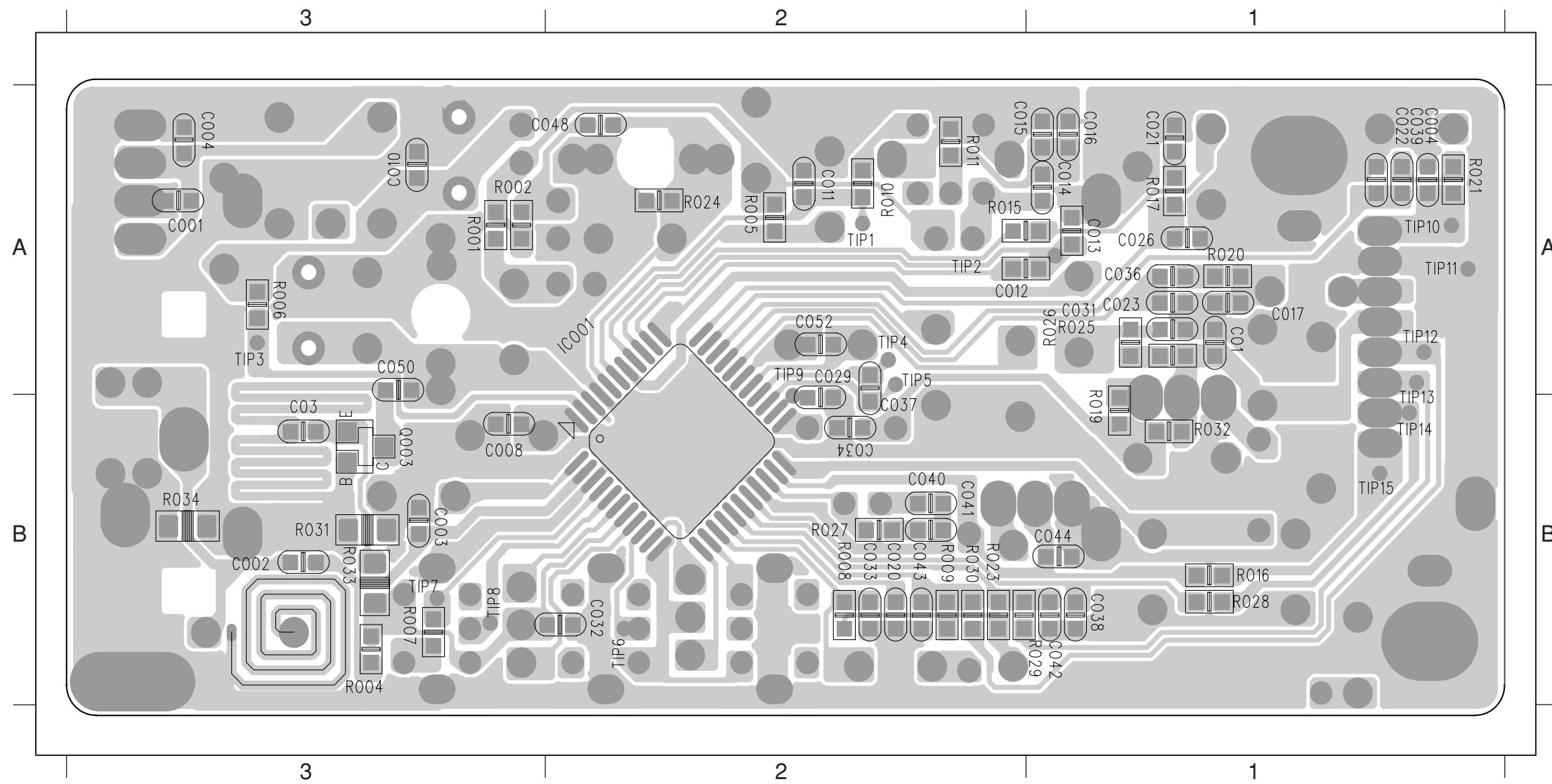
PCB LAYOUT - TUNER BOARD ( TOP)

|        |    |       |    |       |    |       |    |      |    |       |    |       |    |
|--------|----|-------|----|-------|----|-------|----|------|----|-------|----|-------|----|
| ANT001 | B1 | C025  | B2 | D002  | A1 | IF003 | A2 | JWP8 | A3 | T001  | B1 | VD001 | A2 |
| C005   | A1 | C030  | B3 | D003  | B2 | JWP2  | B1 | JWP9 | B3 | T002  | B2 | VD002 | A1 |
| C006   | A2 | C035  | A2 | D004  | B3 | JWP3  | A3 | L02  | A2 | T003  | B2 | VD003 | A1 |
| C007   | B1 | C047  | A1 | D005  | A1 | JWP4  | A3 | L001 | B1 | T005  | A2 | VD004 | A2 |
| C009   | A2 | CN001 | B3 | IC001 | B2 | JWP5  | B2 | Q001 | A3 | T006  | A1 | VR001 | A3 |
| C019   | B1 | CN002 | A1 | IF001 | B1 | JWP6  | B3 | Q002 | B2 | VC001 | A1 | XL1   | B2 |
| C024   | B2 | D001  | A1 | IF002 | B2 | JWP7  | B2 | R018 | B3 | VC002 | A1 |       |    |



PCB LAYOUT - TUNER BOARD ( BOTTOM)

|      |    |      |    |      |    |      |    |       |    |      |    |      |    |      |    |
|------|----|------|----|------|----|------|----|-------|----|------|----|------|----|------|----|
| C01  | A3 | C013 | A3 | C023 | A3 | C037 | A2 | C048  | A2 | R005 | A2 | R019 | B3 | R028 | B3 |
| C03  | B3 | C014 | A3 | C026 | A3 | C038 | B3 | C050  | A3 | R006 | A3 | R020 | A3 | R029 | B3 |
| C001 | A3 | C015 | A2 | C029 | A2 | C039 | A3 | C052  | A2 | R007 | B3 | R021 | A3 | R030 | B2 |
| C002 | B3 | C016 | A3 | C031 | A3 | C040 | B2 | IC001 | A2 | R010 | A2 | R023 | B2 | R031 | B3 |
| C008 | B3 | C020 | B2 | C032 | A2 | C041 | B2 | Q003  | B3 | R011 | A2 | R024 | A2 | R032 | B3 |
| C010 | A3 | C021 | A3 | C033 | B2 | C042 | B3 | R001  | A3 | R015 | A2 | R025 | A3 | R033 | B3 |
| C011 | A2 | C022 | A3 | C034 | B2 | C043 | B2 | R002  | A3 | R016 | B3 | R026 | A3 | R034 | B3 |
| C012 | A2 | C023 | A3 | C036 | A3 | C044 | B3 | R004  | B3 | R017 | A3 | R027 | B2 |      |    |



**ELECTRICAL PARTS LIST - TUNER BOARD**

**MISCELLANEOUS**

|        |                |                                |
|--------|----------------|--------------------------------|
| ANT001 | 9965 000 17361 | RF JACK FEMALE TYPE ID1.44MM   |
| CN002  | 9965 000 15855 | CONNECTOR S2B-XH-A 2P          |
| IF001  | 9965 000 17368 | CER FILTER 10.7 MHZ            |
| IF002  | 9965 000 15868 | CER FILTER 10.7 MHZ            |
| IF003  | 9965 000 23585 | CER FILTER CDA10.7MG-18A       |
| L001   | 9965 000 23586 | SPRING COIL 0.8X4.5DX(1-2)2.5T |
| L02    | 9965 000 23587 | MOULDED COIL 2.5T 57-89nH      |
| T001   | 9965 000 22254 | AM IFT 455KHZ 180pF            |
| T002   | 9965 000 22255 | AM IFT 455KHZ 180pF            |
| T003   | 9965 000 22255 | AM IFT 455KHZ 180pF            |
| T005   | 9965 000 22253 | OSC COIL AM 120uH (796 KHZ)    |
| T006   | 9965 000 15874 | ANT OSC AM 4-6:10T 1-3:86T     |
| VC001  | 9965 000 15866 | COND TRIM 4.2 - 20 pF N450     |
| VC002  | 9965 000 15866 | COND TRIM 4.2 - 20 pF N450     |
| VR001  | 9965 000 22264 | CNTL TRIMMER 100KR P=5X5MM     |
| XL1    | 9965 000 23588 | CRYSTAL 75KHZ +/-15 PPM COLUMN |

**DIODES**

|       |                |                 |
|-------|----------------|-----------------|
| D001  | 4822 130 30621 | 1N4148          |
| D002  | 4822 130 30621 | 1N4148          |
| D003  | 4822 130 30621 | 1N4148          |
| D004  | 9965 000 17375 | 11.9-12.4V 0.5W |
| D005  | 4822 130 30621 | 1N4148          |
| VD001 | 4822 130 30621 | 1N4148          |
| VD002 | 4822 130 30621 | 1N4148          |
| VD003 | 4822 130 81673 | 1SV149          |
| VD004 | 4822 130 81673 | 1SV149          |

**TRANSISTORS & INTEGRATED CIRCUITS**

|       |                |                         |
|-------|----------------|-------------------------|
| Q001  | 4822 130 41198 | 2SC945P                 |
| Q002  | 4822 130 41198 | 2SC945P                 |
| Q003  | 9965 000 22272 | XISTR PNP BF550 SOT23   |
| IC001 | 9965 000 22265 | IC 44PIN TEA5757H QFP44 |

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

**VOLTAGES**

| IC101 (TEA5757H) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| PIN              | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
| VOLTAGE(FM)      | 2.1  | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 7.21 | 4.49 | 1    | 0.7  | 1.24 | 0.83 | 0.77 | 0.63 | 0.64 | 1.01 | 0.01 | 0    | 1.15 | 1.15 |
| VOLTAGE(AM)      | 2.1  | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 7.45 | 1.12 | 1.36 | 0.58 | 1.24 | 0.18 | 0.77 | 0.63 | 0.64 | 1.01 | 0.01 | 0    | 1.15 | 1.15 |
| PIN              | 21   | 22   | 23   | 24   | 25   | 26   | 27   | 28   | 29   | 30   | 31   | 32   | 33   | 34   | 35   | 36   | 37   | 38   | 39   | 40   |
| VOLTAGE(FM)      | 1.94 | 10.9 | 9.13 | 1.26 | 1.92 | 0.01 | 0.19 | 0.52 | 0.2  | 0.01 | 0.01 | 1.43 | 0.75 | 1.43 | 0.7  | 1.43 | 0.62 | 1.35 | 1.02 | 1.34 |
| VOLTAGE(AM)      | 1.94 | 10.9 | 9.13 | 1.2  | 1.88 | 0.01 | 0.19 | 0.52 | 0.2  | 0.01 | 0.01 | 1.43 | 1.44 | 1.47 | 1.42 | 1.47 | 1.32 | 1.35 | 1.41 | 1.37 |
| PIN              | 41   | 42   | 43   | 44   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| VOLTAGE(FM)      | 1.35 | 0.01 | 0.75 | 0.15 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| VOLTAGE(AM)      | 1.35 | 0.01 | 0.75 | 0.43 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

**Q101 (BF550)**

| PIN         | 1    | 2    | 3    |
|-------------|------|------|------|
| VOLTAGE(FM) | 0.01 | 0.66 | 0.01 |
| VOLTAGE(AM) | 0.01 | 0.66 | 0.01 |

**Q104 (2SC945)**

| PIN         | 1    | 2     | 3    |
|-------------|------|-------|------|
| VOLTAGE(FM) | 0.07 | -0.03 | 1.3  |
| VOLTAGE(AM) | 0.08 | 0.01  | 1.24 |

**Q105 (2SC945)**

| PIN         | 1     | 2     | 3     |
|-------------|-------|-------|-------|
| VOLTAGE(FM) | 10.12 | 11.8  | 10.77 |
| VOLTAGE(AM) | 10.17 | 11.81 | 10.82 |

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# DVD LOADER

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## *(For Information only)*

It is not recommended for component repair on this module but to replace the module when it becomes defective.

Therefore no service parts list is published in this chapter.

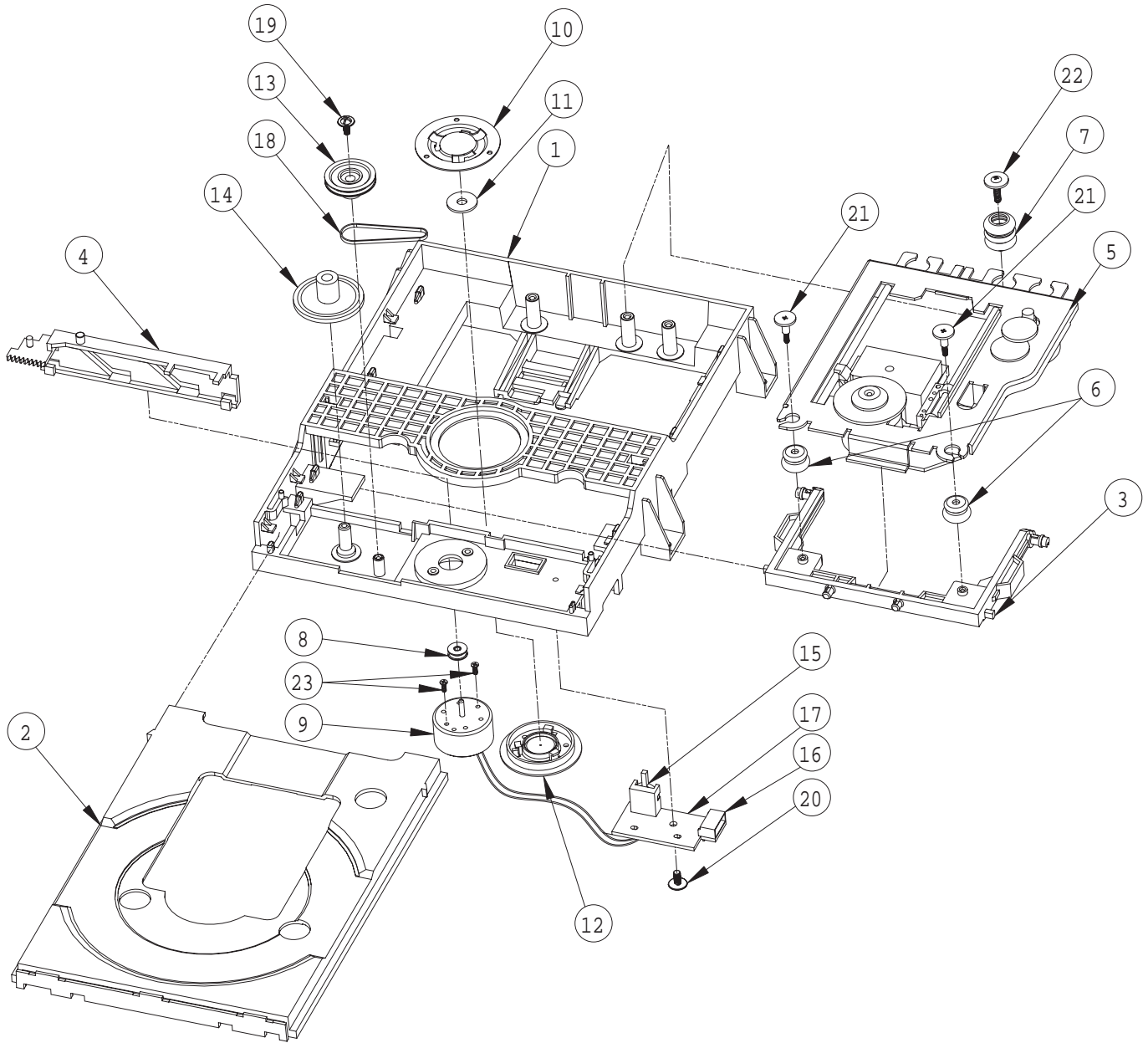
The only service part available for replacement is:

DVD MECH. LOADER ASSY ..... 9965 000 23573

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# Exploded View (DVD Loader)



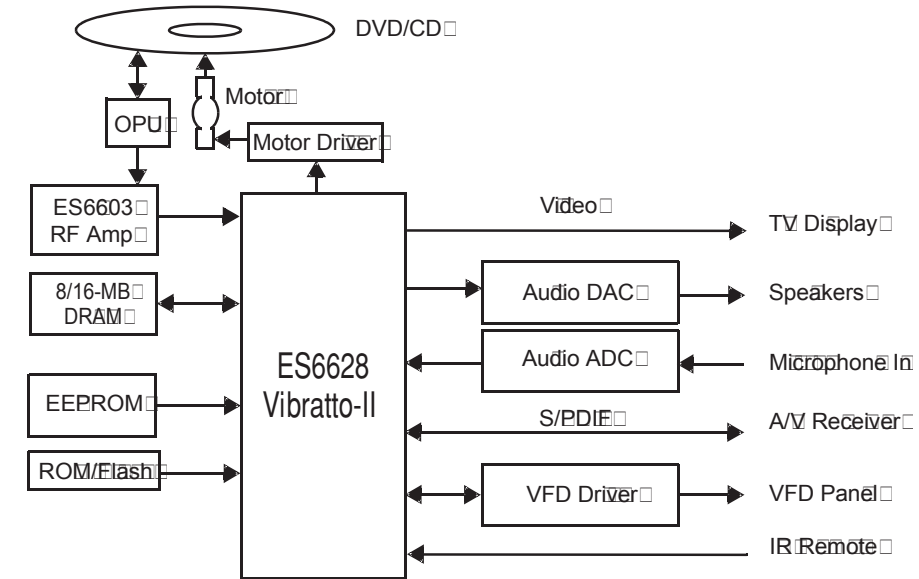


# MAIN BOARD

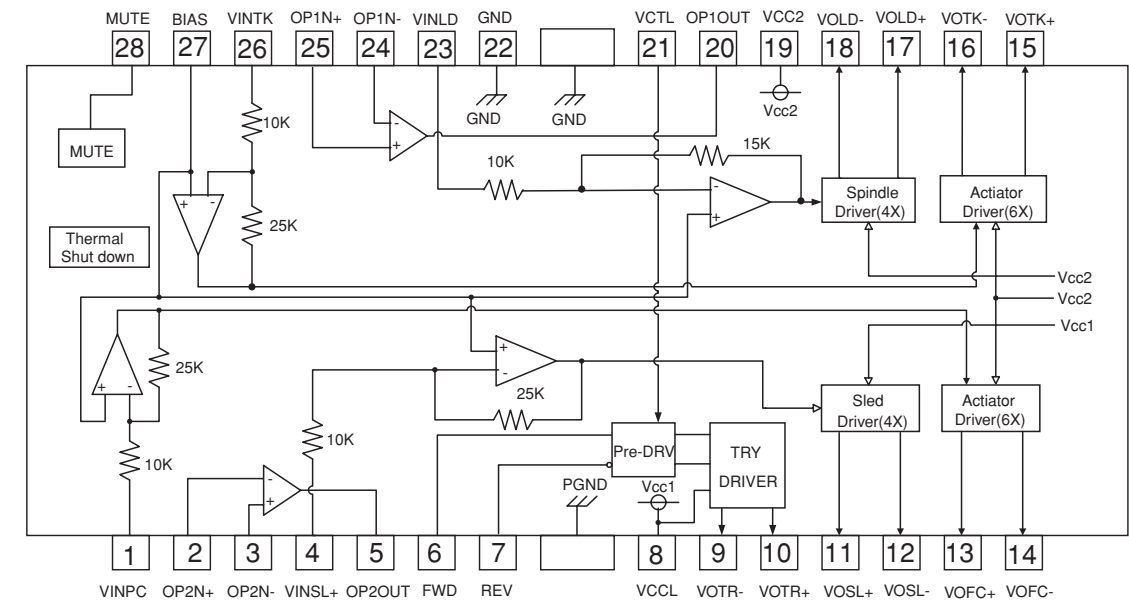
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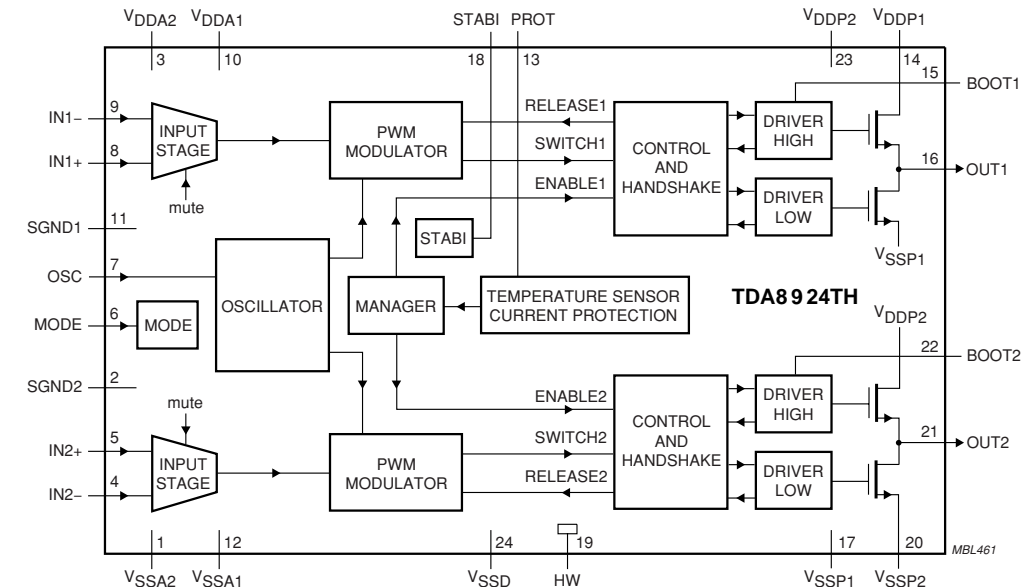
### ES6628 F INTERNAL IC DIAGRAM



### AM5868 S INTERNAL IC DIAGRAM

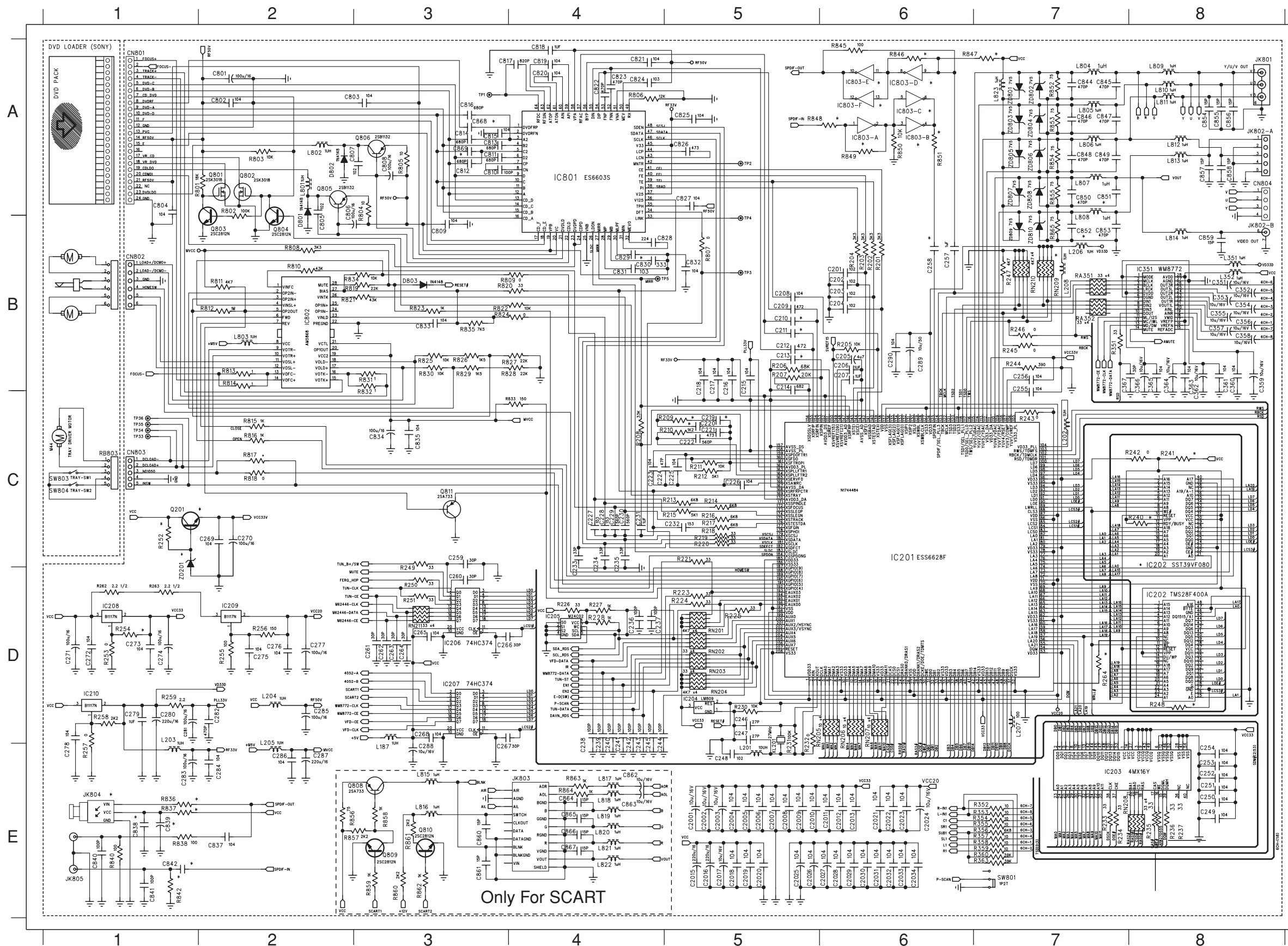


### TDA8924TH INTERNAL IC DIAGRAM





# CIRCUIT DIAGRAM ( 1) - MAIN BOARD



|      |    |       |    |          |    |       |    |
|------|----|-------|----|----------|----|-------|----|
| C201 | B6 | C801  | A2 | IC210    | D1 | R360  | E7 |
| C202 | B6 | C802  | A2 | IC351    | B8 | R363  | E7 |
| C203 | B6 | C803  | A3 | IC801    | A4 | R801  | A1 |
| C204 | B6 | C804  | A1 | IC802    | B2 | R802  | A2 |
| C205 | B6 | C805  | B2 | J K801   | A8 | R803  | A2 |
| C206 | B6 | C806  | A2 | J K802-A | A8 | R804  | A3 |
| C207 | B6 | C807  | A2 | J K802-B | B8 | R805  | A3 |
| C208 | B5 | C808  | A3 | J K805   | E1 | R806  | A4 |
| C209 | B5 | C809  | B3 | L187     | E3 | R807  | B5 |
| C212 | B5 | C810  | A3 | L201     | E5 | R808  | B2 |
| C214 | B5 | C811  | A3 | L202     | C7 | R809  | B2 |
| C215 | B5 | C812  | A3 | L203     | D1 | R810  | B2 |
| C216 | B5 | C813  | A3 | L204     | D2 | R811  | B2 |
| C217 | B5 | C814  | A3 | L205     | E2 | R812  | B2 |
| C218 | B5 | C815  | A3 | L206     | B7 | R813  | B2 |
| C221 | C5 | C816  | A3 | L207     | D7 | R814  | B2 |
| C222 | C5 | C817  | A4 | L351     | B8 | R815  | C2 |
| C223 | C4 | C818  | A4 | L352     | B8 | R816  | C2 |
| C224 | C4 | C819  | A4 | L801     | A2 | R818  | C2 |
| C225 | C5 | C820  | A4 | L802     | A2 | R819  | B2 |
| C226 | C5 | C821  | A4 | L803     | B2 | R820  | B3 |
| C227 | C4 | C822  | A4 | L804     | A7 | R821  | B2 |
| C228 | C4 | C823  | A4 | L805     | A7 | R822  | B3 |
| C229 | C4 | C824  | A4 | L806     | A7 | R823  | B3 |
| C230 | C4 | C825  | A5 | L807     | A7 | R824  | B3 |
| C231 | C4 | C826  | A5 | L808     | B7 | R825  | B3 |
| C232 | C5 | C827  | A5 | L809     | A8 | R826  | B3 |
| C233 | C4 | C828  | B4 | L810     | A8 | R827  | B3 |
| C234 | C4 | C830  | B4 | L811     | A8 | R828  | B4 |
| C235 | C4 | C831  | B4 | L812     | A8 | R829  | B3 |
| C236 | D4 | C832  | B5 | L813     | A8 | R830  | B3 |
| C237 | D4 | C833  | B3 | L814     | B8 | R831  | B3 |
| C238 | D4 | C834  | C3 | L823     | A7 | R832  | B3 |
| C239 | D4 | C835  | C3 | Q801     | A2 | R833  | C2 |
| C240 | D4 | C837  | E2 | Q802     | A2 | R834  | B2 |
| C241 | D4 | C840  | E1 | Q803     | B2 | R835  | B3 |
| C242 | D4 | C841  | E1 | Q804     | B2 | R838  | E1 |
| C243 | D4 | C844  | A7 | Q805     | A2 | R840  | E1 |
| C244 | D4 | C845  | A7 | Q806     | A3 | R845  | A6 |
| C245 | D4 | C846  | A7 | Q811     | C3 | R850  | A6 |
| C246 | D6 | C847  | A7 | R201     | B6 | R852  | A7 |
| C247 | D6 | C848  | A7 | R202     | B6 | R853  | A7 |
| C248 | E5 | C849  | A7 | R203     | B6 | R854  | A7 |
| C249 | E8 | C850  | A7 | R204     | B6 | R855  | A7 |
| C250 | E8 | C851  | A7 | R205     | B6 | R855  | B7 |
| C251 | E8 | C852  | B7 | R206     | B5 | RA351 | B7 |
| C252 | E8 | C853  | B7 | R207     | B5 | RA352 | B7 |
| C253 | E8 | C854  | A8 | R208     | C4 | RA201 | D6 |
| C254 | E8 | C855  | A8 | R210     | C5 | RA202 | D6 |
| C255 | B7 | C856  | A8 | R211     | C5 | RA203 | D6 |
| C256 | B7 | C857  | A8 | R212     | C5 | RA204 | D6 |
| C257 | B6 | C858  | A8 | R213     | C5 | RA205 | D6 |
| C259 | C3 | C859  | B8 | R214     | C5 | RA206 | D6 |
| C260 | D3 | C2001 | E5 | R215     | C5 | RA207 | D6 |
| C261 | D3 | C2002 | E5 | R216     | C5 | RA208 | E8 |
| C262 | D3 | C2003 | E5 | R217     | C5 | RA210 | B7 |
| C263 | D3 | C2004 | E5 | R218     | C5 | RA211 | D3 |
| C264 | D3 | C2005 | E5 | R219     | C5 | SW804 | C1 |
| C265 | D3 | C2006 | E5 | R220     | C5 | XL201 | E5 |
| C266 | D3 | C2007 | E5 | R221     | C5 | ZD801 | A7 |
| C267 | E3 | C2008 | E5 | R222     | D6 | ZD802 | A7 |
| C268 | D3 | C2009 | E6 | R224     | D6 | ZD803 | A7 |
| C269 | C2 | C2010 | E6 | R225     | D6 | ZD804 | A7 |
| C270 | C2 | C2011 | E6 | R226     | D4 | ZD805 | A7 |
| C271 | D1 | C2012 | E6 | R227     | D4 | ZD806 | A7 |
| C272 | D1 | C2013 | E6 | R228     | D4 | ZD807 | A7 |
| C273 | D1 | C2015 | E5 | R230     | D6 | ZD808 | A7 |
| C274 | D1 | C2016 | E5 | R231     | E5 | ZD809 | B7 |
| C275 | D2 | C2017 | E5 | R232     | D5 | ZD810 | B7 |
| C276 | D2 | C2018 | E5 | R233     | E7 |       |    |
| C277 | D2 | C2019 | E5 | R234     | E7 |       |    |
| C278 | E1 | C2020 | E5 | R235     | E8 |       |    |
| C279 | D1 | C2021 | E6 | R236     | E8 |       |    |
| C280 | D1 | C2022 | E6 | R237     | E8 |       |    |
| C281 | D1 | C2023 | E6 | R242     | C8 |       |    |
| C282 | D2 | C2024 | E6 | R243     | C7 |       |    |
| C283 | E1 | C2025 | E5 | R244     | B7 |       |    |
| C284 | E2 | C2026 | E5 | R245     | B7 |       |    |
| C285 | D2 | C2027 | E6 | R246     | B7 |       |    |
| C286 | E2 | C2028 | E6 | R247     | B7 |       |    |
| C287 | E2 | C2029 | E6 | R248     | D8 |       |    |
| C288 | E3 | C2030 | E6 | R249     | D8 |       |    |
| C289 | B6 | C2031 | E6 | R250     | D3 |       |    |
| C290 | B6 | C2032 | E6 | R251     | D3 |       |    |
| C351 | B8 | C2033 | E6 | R253     | D1 |       |    |
| C352 | B8 | C2034 | E6 | R255     | D2 |       |    |
| C353 | B8 | CN801 | A1 | R256     | D2 |       |    |
| C354 | B8 | CN802 | B1 | R257     | E1 |       |    |
| C355 | B8 | CN803 | C1 | R258     | D1 |       |    |
| C356 | B8 | D801  | B2 | R259     | D1 |       |    |
| C357 | B8 | D802  | A2 | R262     | D1 |       |    |
| C358 | B8 | D803  | B3 | R263     | D1 |       |    |
| C359 | B8 | IC201 | C6 | R351     | B7 |       |    |
| C360 | B8 | IC202 | C8 | R352     | E7 |       |    |
| C361 | B8 | IC203 | E7 | R353     | E7 |       |    |
| C362 | B8 | IC204 | D6 | R354     | E7 |       |    |
| C363 | B8 | IC205 | D4 | R355     | E7 |       |    |
| C364 | B8 | IC206 | D3 | R356     | E7 |       |    |
| C365 | B8 | IC207 | D3 | R357     | E7 |       |    |
| C366 | B8 | IC208 | D1 | R358     | E7 |       |    |
| C367 | B7 | IC209 | D2 | R359     | E7 |       |    |

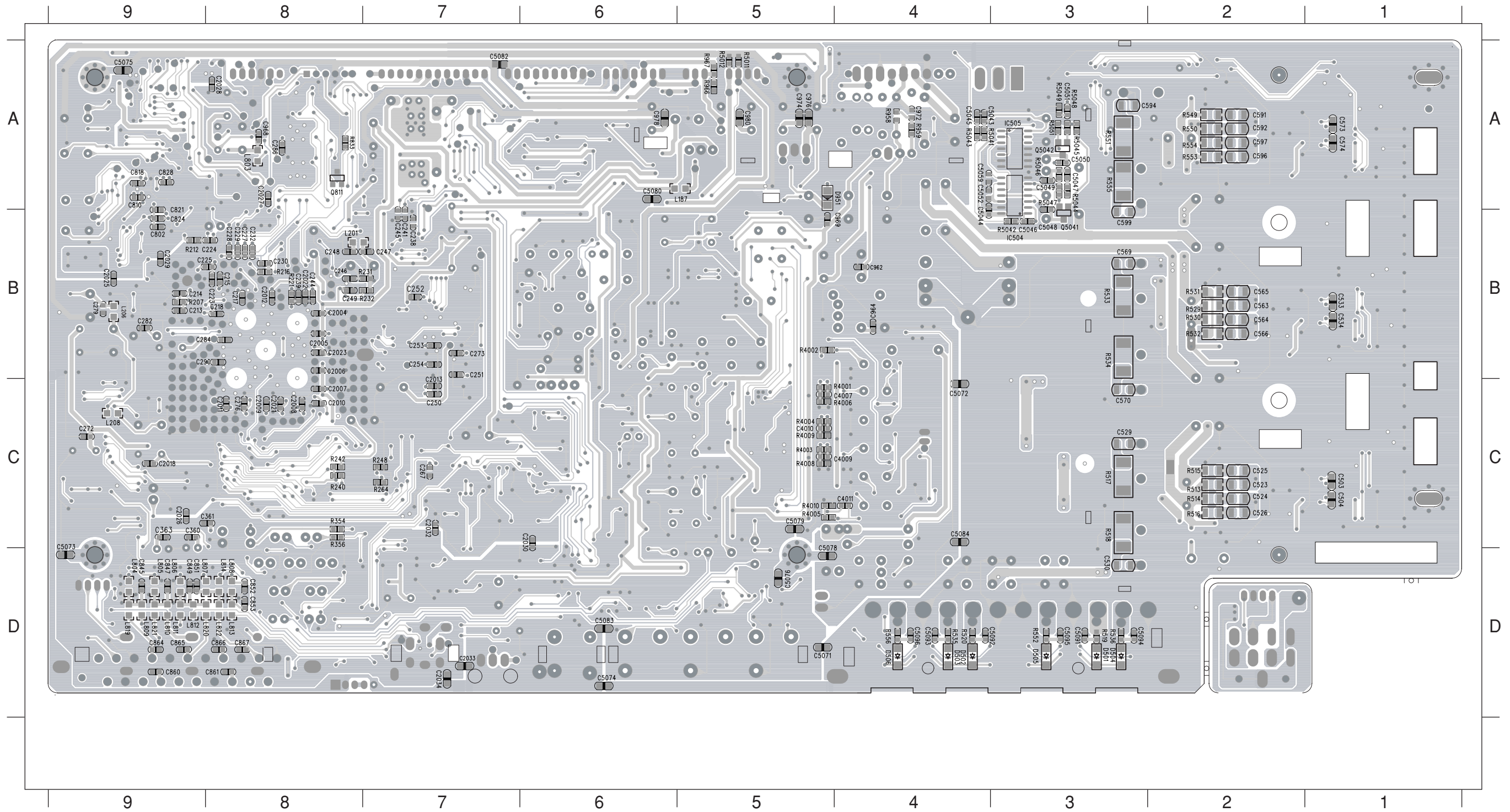
Only For SCART





# PCB LAYOUT - MAIN BOARD ( BOTTOM )

|      |    |      |    |      |    |      |    |      |    |      |    |       |    |       |    |       |    |       |    |       |    |       |    |       |    |      |    |      |    |       |    |       |    |
|------|----|------|----|------|----|------|----|------|----|------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|------|----|------|----|-------|----|-------|----|
| C214 | B9 | C239 | B8 | C267 | C7 | C504 | C1 | C569 | B3 | C821 | B9 | C972  | A4 | C2012 | B8 | C4010 | C5 | C5071 | D5 | C5092 | D3 | IC505 | A3 | L811  | D9 | R242 | C8 | R529 | B2 | R555  | A3 | R4009 | C5 |
| C215 | B8 | C241 | B7 | C272 | C9 | C523 | C2 | C570 | C3 | C824 | B9 | C974  | A5 | C2013 | C7 | C4011 | C4 | C5072 | C4 | C5093 | D4 | L187  | A5 | L812  | D9 | R248 | C7 | R530 | B2 | R556  | D4 | R4010 | C5 |
| C217 | B8 | C244 | B8 | C273 | B7 | C524 | C2 | C573 | A1 | C828 | A9 | C976  | A5 | C2018 | C9 | C5043 | A3 | C5073 | D9 | C5094 | D3 | L201  | B8 | L813  | D8 | R354 | C8 | R531 | B2 | R633  | A8 | R5011 | A5 |
| C218 | B8 | C245 | B7 | C276 | C8 | C525 | C2 | C574 | A1 | C845 | D9 | C978  | A6 | C2021 | C8 | C5044 | B4 | C5074 | D6 | C5095 | D3 | L206  | B9 | L814  | D8 | R356 | D8 | R532 | B2 | R558  | A4 | R5012 | A5 |
| C223 | B8 | C246 | B8 | C279 | B9 | C526 | C2 | C591 | A2 | C847 | D9 | C980  | A5 | C2022 | B8 | C5045 | A4 | C5075 | A9 | C5096 | D4 | L208  | C9 | Q5041 | B3 | R513 | C2 | R533 | B3 | R559  | A4 | R5041 | A3 |
| C224 | B8 | C247 | B7 | C282 | B9 | C529 | C3 | C592 | A2 | C849 | D9 | C2004 | B8 | C2023 | B8 | C5046 | B3 | C5076 | D5 | D501  | D3 | L803  | A8 | Q5042 | A3 | R514 | C2 | R534 | B3 | R567  | A5 | R5042 | B3 |
| C225 | B9 | C248 | B8 | C284 | B8 | C530 | D3 | C594 | A2 | C851 | D9 | C2005 | B8 | C2025 | B9 | C5047 | A3 | C5078 | D5 | D502  | D4 | L804  | D9 | Q811  | A8 | R515 | C2 | R535 | D4 | R4001 | C4 | R5043 | A4 |
| C227 | B8 | C249 | B8 | C286 | A8 | C533 | B1 | C596 | A2 | C852 | D8 | C2006 | C8 | C2030 | D6 | C5048 | B3 | C5079 | C5 | D503  | D4 | L805  | D9 | R207  | B9 | R516 | C2 | R536 | D3 | R4002 | B5 | R5044 | A3 |
| C228 | B8 | C250 | C7 | C290 | B8 | C534 | B1 | C597 | A2 | C853 | D8 | C2007 | C8 | C2032 | C7 | C5049 | A3 | C5080 | A6 | D504  | D3 | L806  | D9 | R212  | B9 | R517 | C3 | R549 | A2 | R4003 | C5 | R5045 | A3 |
| C229 | B8 | C251 | C7 | C360 | D9 | C563 | B2 | C599 | B3 | C962 | B4 | C2008 | C8 | C2033 | D7 | C5050 | A3 | C5082 | A7 | D505  | D3 | L807  | D8 | R216  | B8 | R518 | D3 | R550 | A2 | R4004 | C5 | R5046 | A3 |
| C230 | B8 | C252 | B7 | C361 | C8 | C564 | B2 | C802 | B9 | C964 | B4 | C2009 | C8 | C2034 | D7 | C5051 | A3 | C5083 | D6 | D506  | D4 | L808  | D8 | R221  | B8 | R519 | D3 | R551 | A3 | R4005 | C5 | R5047 | B3 |
| C232 | B8 | C253 | B7 | C363 | D9 | C565 | B2 | C810 | B9 | C968 | A8 | C2010 | C8 | C4007 | C4 | C5052 | A4 | C5084 | D4 | D951  | A4 | L809  | D9 | R231  | B7 | R520 | D4 | R553 | A2 | R4006 | C4 | R5048 | A3 |
| C238 | B7 | C254 | C7 | C503 | C1 | C566 | B2 | C818 | A9 | C969 | B4 | C2011 | C8 | C4009 | C4 | C5059 | A4 | C5091 | D3 | IC504 | B3 | L810  | D9 | R232  | B7 | R522 | D3 | R554 | A2 | R4008 | C5 | R5049 | A3 |





**ELECTRICAL PARTS LIST - MAIN BOARD**

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## TRANSISTORS &amp; INTEGRATED CIRCUITS

|        |                |                              |
|--------|----------------|------------------------------|
| IC207  | 9965 000 20293 | IC 20 PIN 74F374D            |
| IC208  | 9965 000 23617 | 3P B1117N 3.3V BAY-LINEAR 1A |
| IC209  | 9965 000 23617 | 3P B1117N 3.3V BAY-LINEAR 1A |
| IC210  | 9965 000 23617 | 3P B1117N 3.3V BAY-LINEAR 1A |
| IC301  | 9965 000 23619 | IC 16 PIN CD4052BM SOIC TI   |
| IC351  | 9965 000 20295 | IC 28 PIN WM8772 TSOP        |
| IC401  | 9965 000 15886 | IC RC4558D                   |
| IC402  | 9965 000 15886 | IC RC4558D                   |
| IC403  | 9965 000 15886 | IC RC4558D                   |
| IC404  | 9965 000 15886 | IC RC4558D                   |
| IC405  | 9965 000 12514 | M62446FP                     |
| IC406  | 9965 000 15886 | IC RC4558D                   |
| IC407  | 9965 000 15886 | IC RC4558D                   |
| IC408  | 9965 000 15886 | IC RC4558D                   |
| IC409  | 9965 000 15886 | IC RC4558D                   |
| IC501  | 9965 000 22228 | IC 24PIN TDA8920TH           |
| IC502  | 9965 000 22228 | IC 24PIN TDA8920TH           |
| IC503  | 9352 719 94518 | IC SM TDA8924TH/N1 (PHSE) R  |
| IC504  | 9965 000 22230 | IC 14 PIN 74LVC04AD          |
| IC505  | 9965 000 22229 | IC14 PIN HEF4013BT           |
| IC801  | 9965 000 21182 | IC 64 PIN ES6603S LQFP ESS   |
| IC802  | 9965 000 23620 | IC 28 PIN AM5868S HSOP AMTEK |
| IC5001 | 9965 000 23621 | IC8PAPA3541 SOP-8 HEADPHONE  |

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



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# POWER BOARD

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## *(For Information only)*

It is not recommended for component repair on this board but to replace the board when it becomes defective.

Therefore no service parts list is published in this chapter.

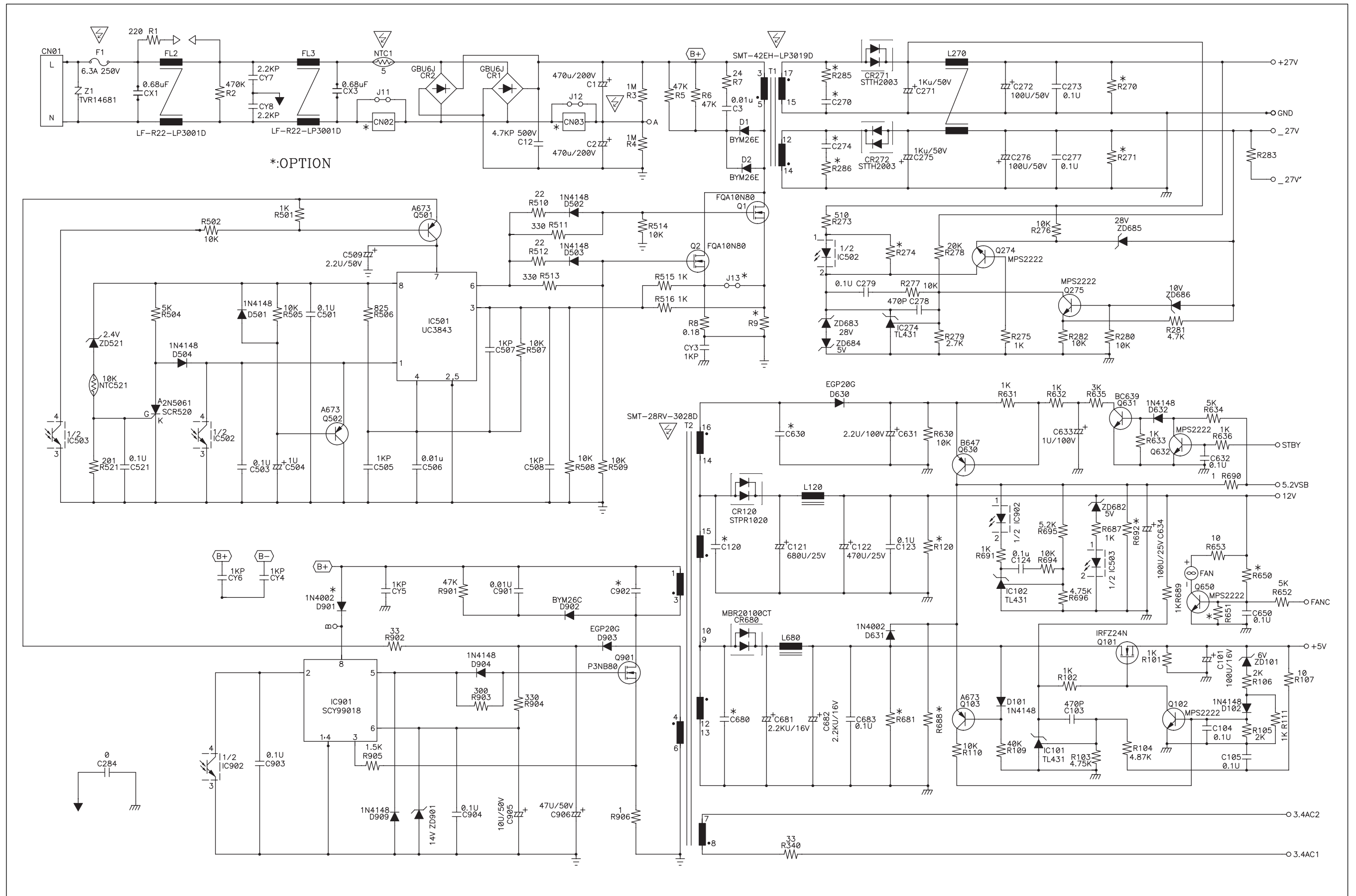
The only service part available for replacement is:

SW PWR SUP ASSY (110V) ..... 9965 000 23652

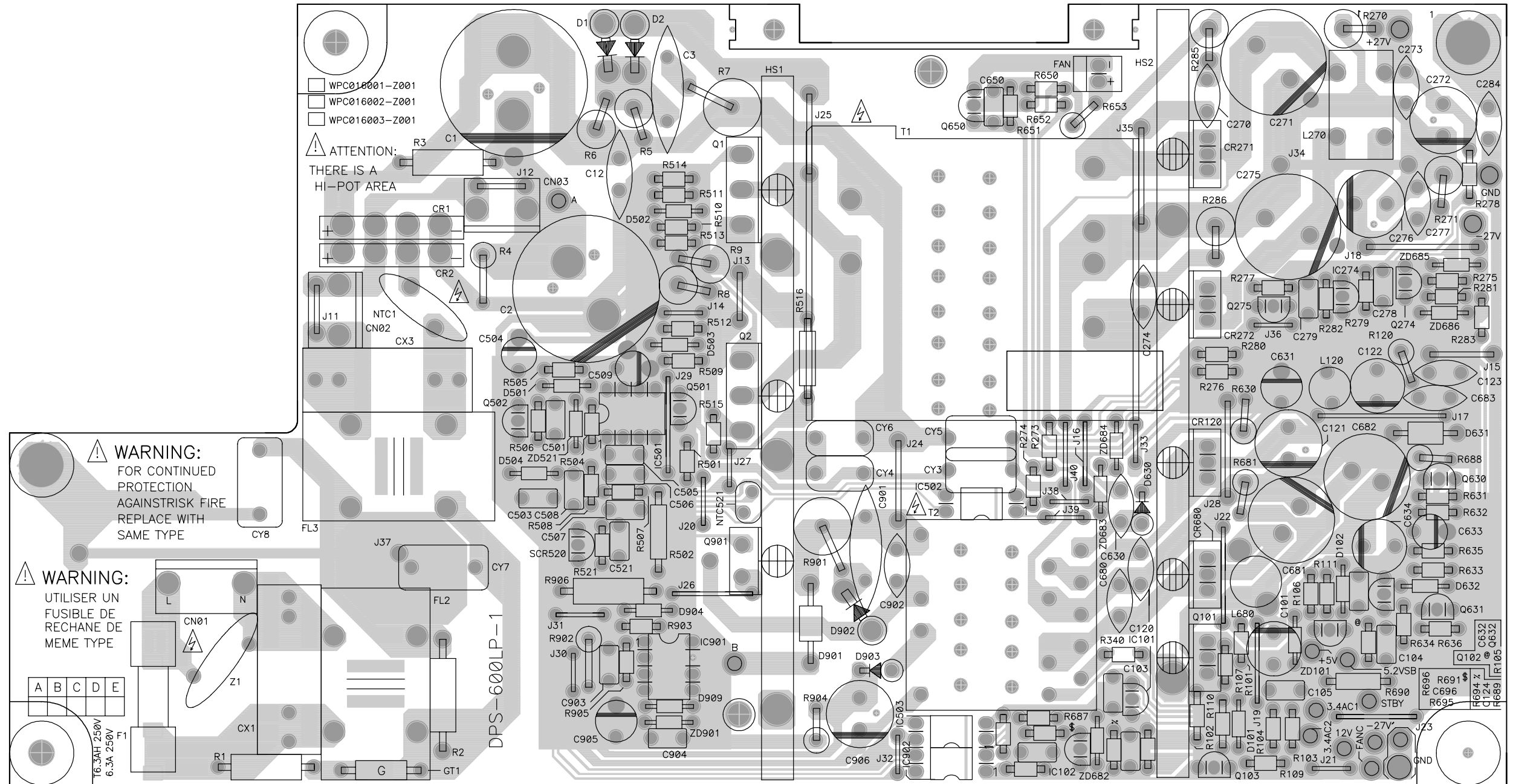
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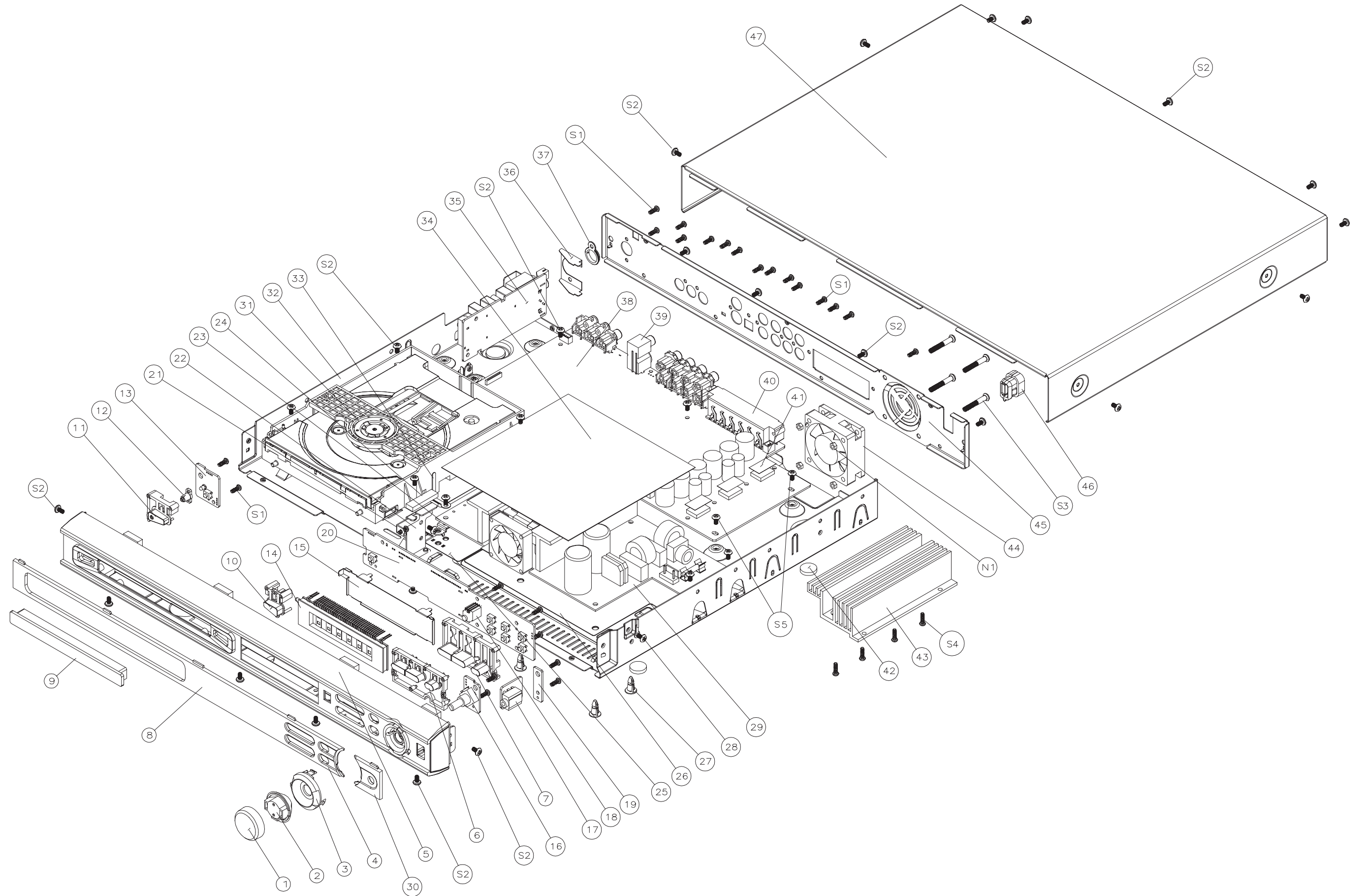
# CIRCUIT DIAGRAM - POWER BOARD ( /17)



PCB LAYOUT - POWER BOARD ( /17)



# MECHANICAL EXPLODED VIEW



**MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT****SCREW LISTS - MAIN UNIT**

|    |                |                        |
|----|----------------|------------------------|
| 1  | 9965 000 23639 | VOLUME KNOB            |
| 2  | 9965 000 23640 | VOLUME DOCKING         |
| 3  | 9965 000 23641 | VOLUME RING            |
| 4  | 9965 000 23642 | VOLUME KNOB LENS       |
| 5  | 9965 000 23643 | FRONT CABINET          |
| 6  | 9965 000 23644 | FUNCTION BUTTON 1      |
| 7  | 9965 000 23645 | FUNCTION BUTTON 2      |
| 8  | 9965 000 23646 | DISPLAY LENS           |
| 9  | 9965 000 23647 | DVD DOOR               |
| 10 | 9965 000 23648 | OPEN/CLOSE BUTTON      |
| 11 | 9965 000 23649 | POWER BUTTON           |
| 12 | 9965 000 23650 | POWER LED LENS         |
| 27 | 9965 000 23651 | SPACER PCB             |
| 29 | 9965 000 23652 | SW PWR SUP ASSY (110V) |
| 31 | 9965 000 23573 | DVD MECH. LOADER ASSY  |
| 37 | 9965 000 23575 | FM ANTENNA HOLDER      |
| 42 | 9965 000 23571 | FOOT RUBBER            |
| 44 | 9965 000 23653 | DC FAN 12V 0.09A       |
| 46 | 9965 000 12817 | BUSHING                |
|    | 9965 000 23654 | SATELLITE SPEAKER ASSY |
|    | 9965 000 23655 | SUBWOOFER ASSY         |
|    | 9965 000 19380 | FFC WIRE 24P 150MM     |
|    | 9965 000 23579 | △ LINE CORD            |
|    | 9965 000 20577 | RCA CABLE 1500MM       |
|    | 9965 000 20234 | RCA CABLE 1500MM       |
|    | 9965 000 23582 | LOOP ANTENNA           |
|    | 9965 000 23583 | FM ANTENNA             |
|    | 9965 000 23656 | REMOTE CONTROL         |
|    | 9965 000 23657 | IFU - ENGLISH/SPANISH  |

**Satellite Speaker Assembly Breakdown**

|                |                             |
|----------------|-----------------------------|
| 9965 000 23664 | CENTER SPEAKER BOX          |
| 9965 000 23665 | CLOTH FRAME ASSY (CENTER)   |
| 9965 000 23666 | FRONT SPEAKER BOX L         |
| 9965 000 23667 | FRONT SPEAKER BOX R         |
| 9965 000 23668 | REAR SPEAKER BOX L          |
| 9965 000 23669 | REAR SPEAKER BOX R          |
| 9965 000 23670 | CLOTHFRAMEASSY (FRONT/REAR) |
| 9965 000 23671 | WALL MOUNT BRACKET          |
| 9965 000 23663 | BADGE PHILIPS               |

**Subwoofer Assembly Breakdown**

|                |                            |
|----------------|----------------------------|
| 9965 000 23662 | CLOTHFRAMEASSY (SUBWOOFER) |
| 9965 000 23663 | BADGE PHILIPS              |

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

|    |         |
|----|---------|
| S1 | D3 x 8  |
| S2 | M3 x 6  |
| S3 | M4 x 25 |
| S4 | D3 x 10 |
| S5 | M3 x 8  |