

Service
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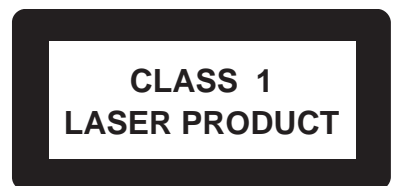


Service Manual



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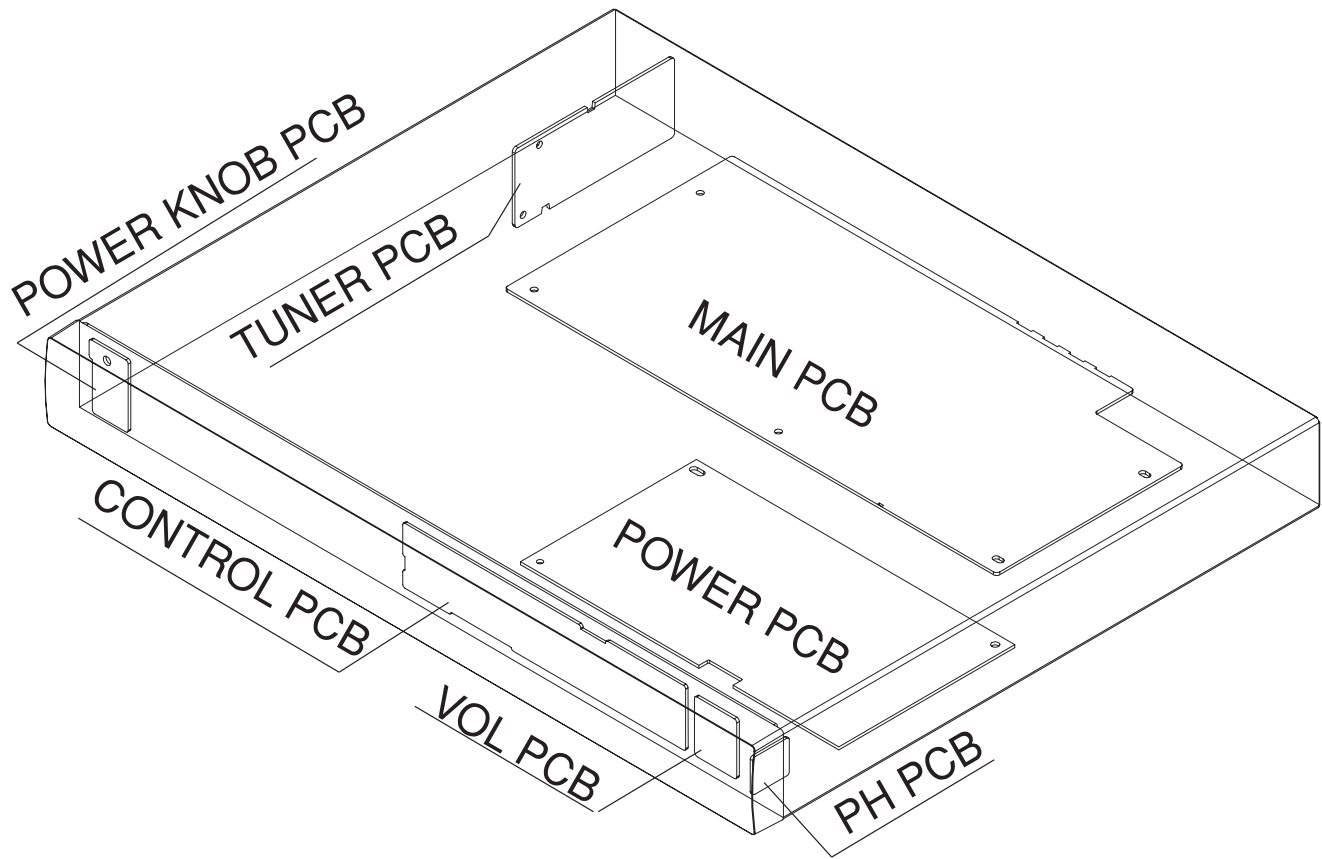
3139 785 30760

Version 1.0



PHILIPS

LOCATION OF PC BOARDS



VERSION VARIATION:

Type /Versions	MX2500D
Features & Board in used:	/78
RDS	
Rotary Encoder (volume control)	x
Aux Input	x
Digital Output	x
Line Output	x
Progressive scan	x
Power supply (110~230V)	x

SPECIFICATIONS

AMPLIFIER SECTION

Output power	200 W Total power
- Front	30 W RMS / channel
.....	30 W FTC®/channel
- Rear	30 W RMS / channel
- Center	30 W RMS
- Subwoofer	50 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
.....	(50 or 100 kHz step)
.....	MW 530 – 1710 kHz (10 kHz)
.....	MW 531 – 1602 kHz (9 kHz)
26 dB Quieting Sensitivity	FM 20 dBf
26 dB Quieting Sensitivity	AM 5000 µV/m
Image Rejection Ratio	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-230V, 50 / 60 Hz
Power Consumption	120W
Dimensions (w × h × d)	435× 53 × 365 (mm)
.....	17.1 × 2.1 × 14.4 (inch)
Weight	4.07 kg / 8.95 pounds

SPEAKERS

Front/Rear speakers	
System	1-way, Bass Reflex system
Impedance	8 Ω
Frequency response	120 Hz – 20 kHz
Dimensions (w × h × d)	90 × 92 × 87 (mm)
.....	3.5× 3.6 × 3.4 (inch)
Weight	0.53 kg/1.17 pounds

CENTER SPEAKERS

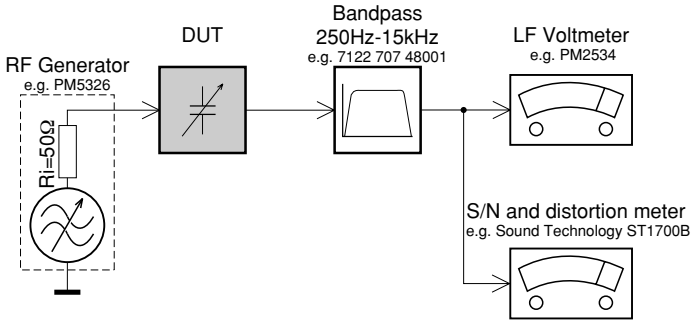
System	1-way, Bass Reflex system
Impedance	8 Ω
speaker drivers	1 x 3 " C
Frequency response	120 Hz – 20 kHz
Dimensions (w × h × d)	90 × 92 × 87 (mm)
.....	3.5 × 3.6 × 3.4 (inch)
Weight	0.53 kg/1.17 pounds

PASSIVE SUBWOOFER

Impedance	4 Ω
speaker drivers	6 1/2" woofer
Frequency response	30 Hz – 120 kHz
Dimensions (w × h × d)	220 × 212 × 350 (mm)
.....	8.7 × 8.3 × 13.8 (inch)
Weight	3.57 kg/7.85 pounds

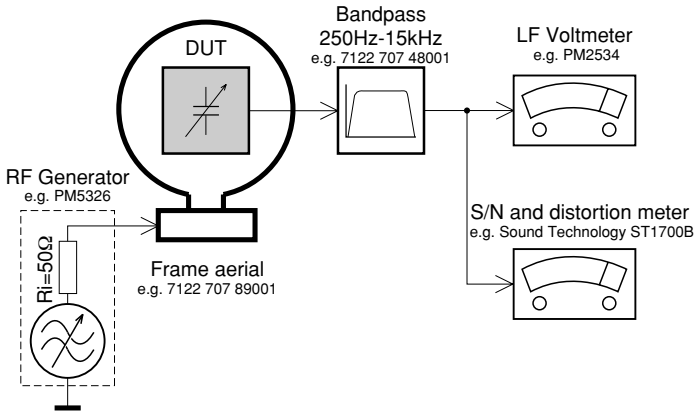
MEASUREMENT SETUP

Tuner FM



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

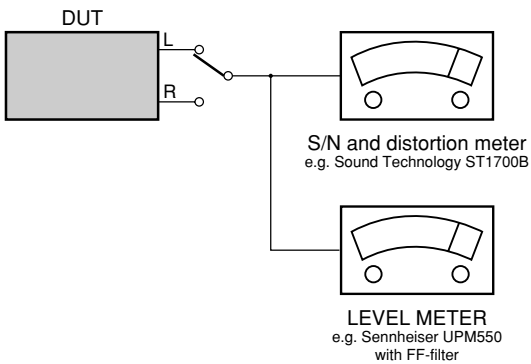
Tuner AM (MW,LW)



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).

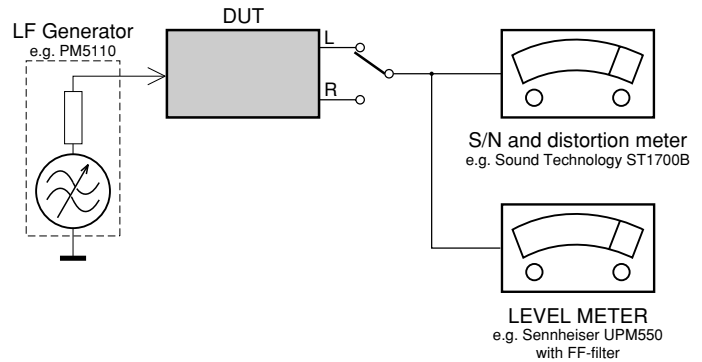
CD

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

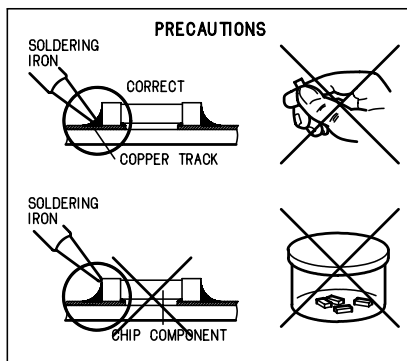
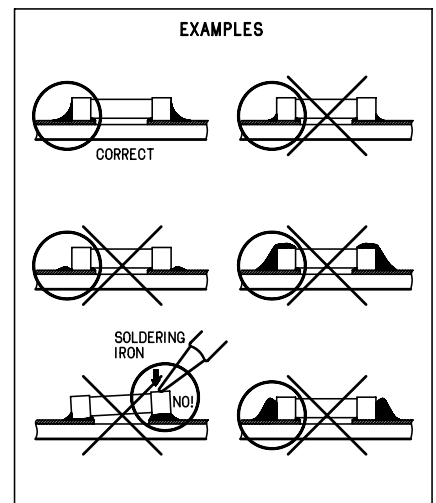
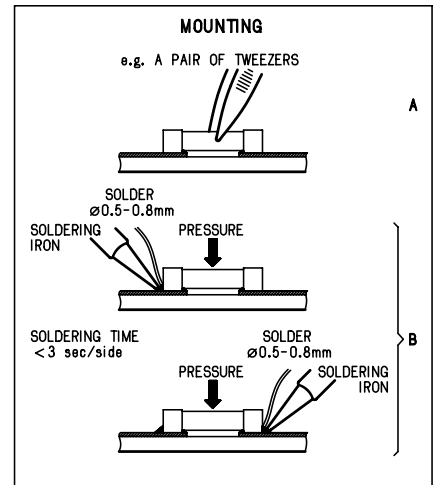
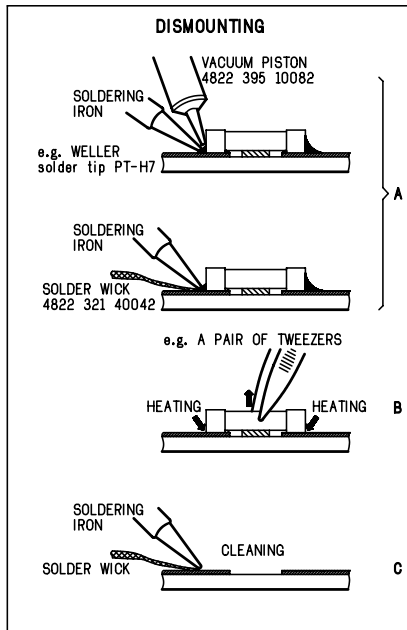
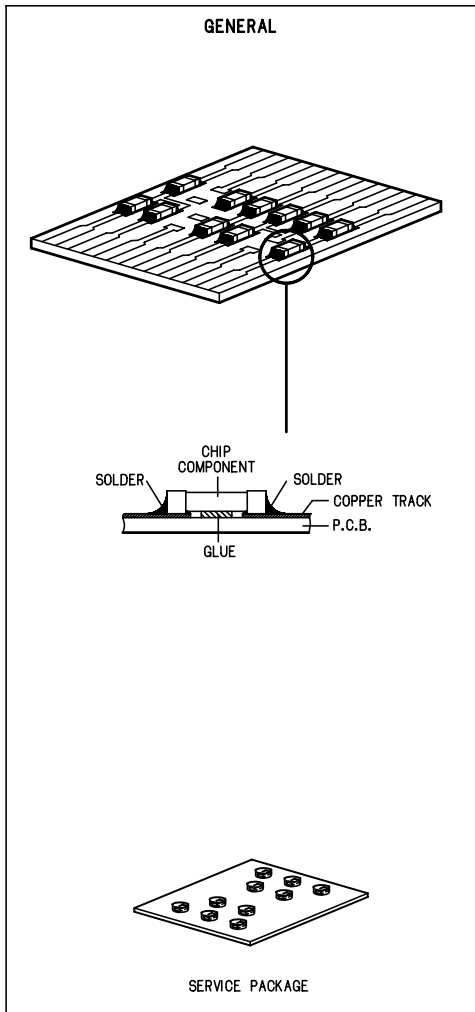
Service Tools:

- Universal Torx driver holder4822 395 91019
- Torx bit T10 150mm4822 395 50456
- Torx driver set T6-T204822 395 50145
- Torx driver T10 extended4822 395 50423

Compact Disc:

- SBC426/426A Test disc 5 + 5A4822 397 30096
- SBC442 Audio Burn-in test disc 1kHz4822 397 30155
- SBC429 Audio Signals disc4822 397 30184
- Dolby Pro-logic Test Disc4822 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 enfiler 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 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) 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 Δ .

(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 Δ .

(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 Δ .

(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 Δ 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 Δ .

(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 spårren är urkopplad. Betrakta ej strålen.

(SF) Varoitus !

Avatussa laitteessa ja suojauslaituksen 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 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 /MX2500D
002	MX3600D/MX3800
003	LX3700D/LX3750W

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 use 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 MX2500D/78 (LATAM) :

<PLAY> <159> <411> <001> <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 reach 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)
LATAM (78)	FM	87.5M	108M	50K /100K
	MW	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.

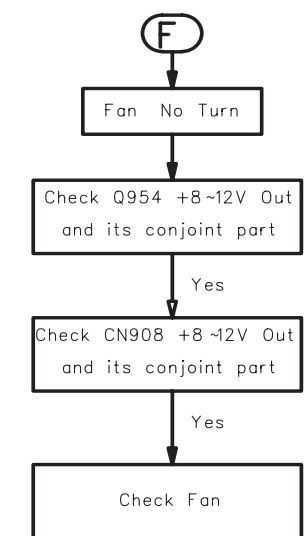
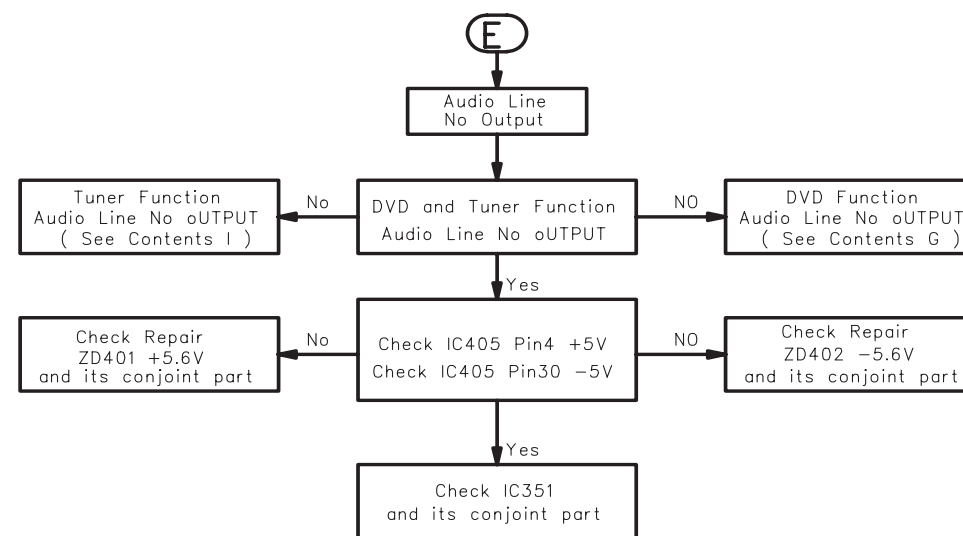
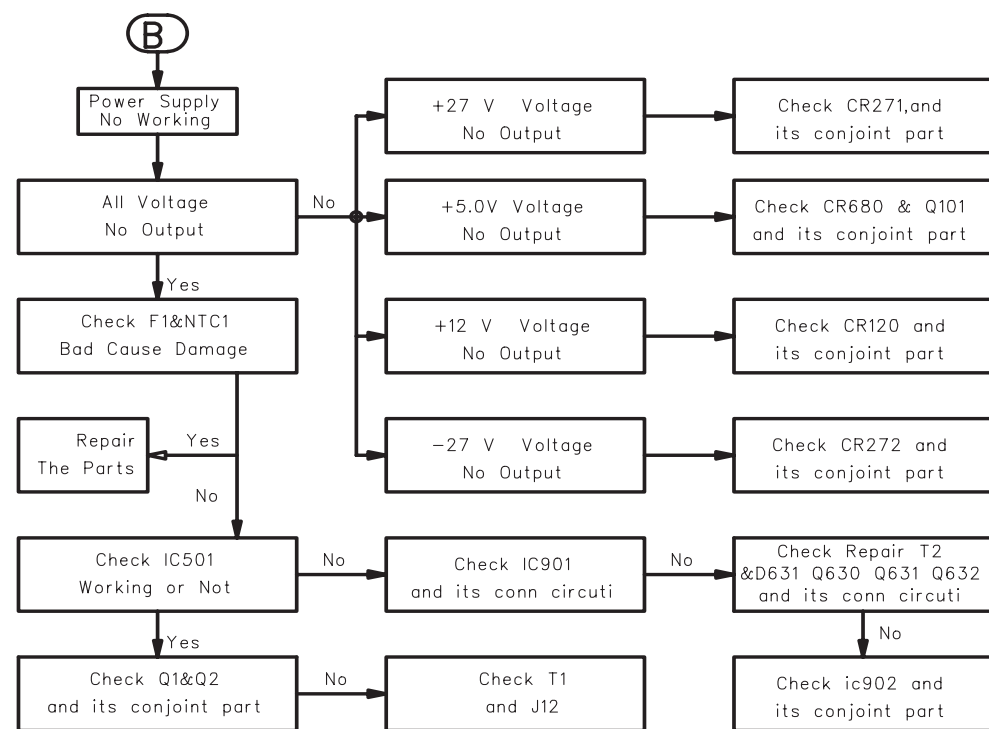
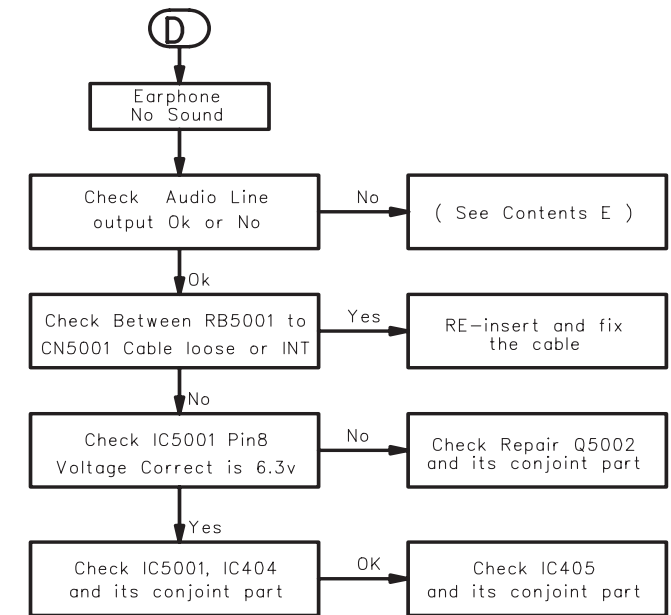
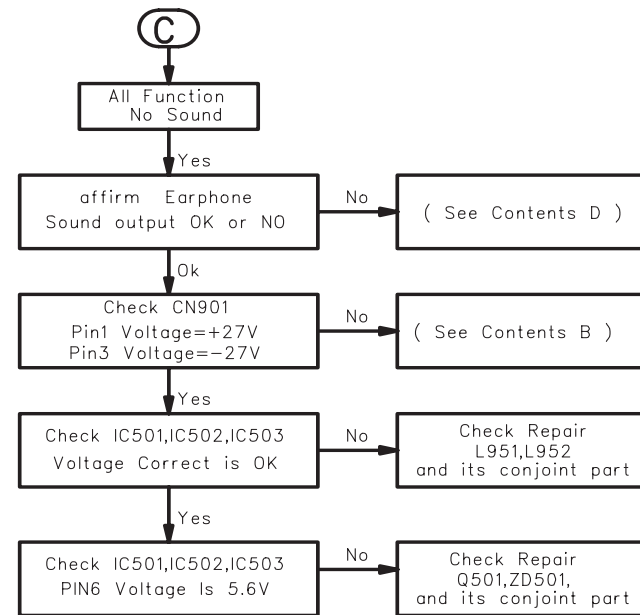
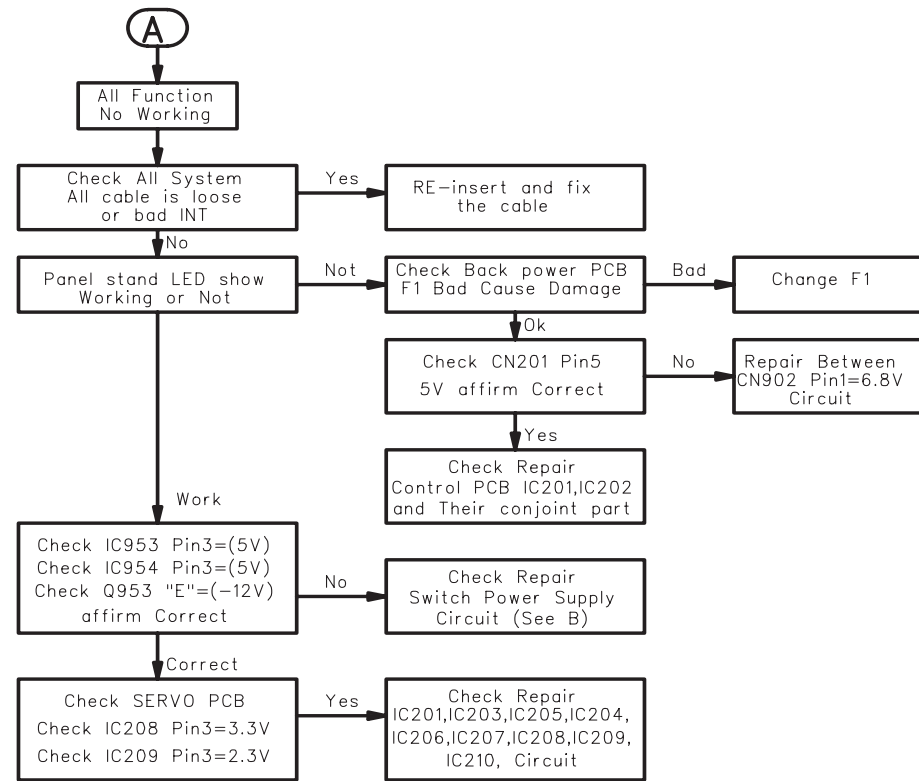
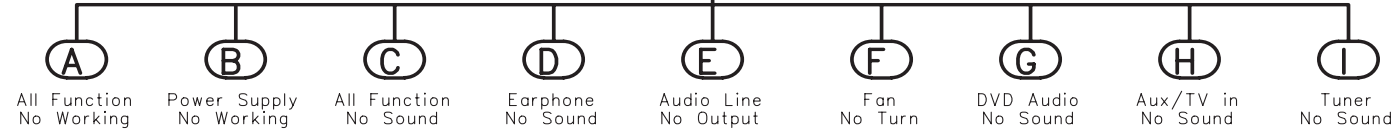
8. Upgrading new software

- 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"

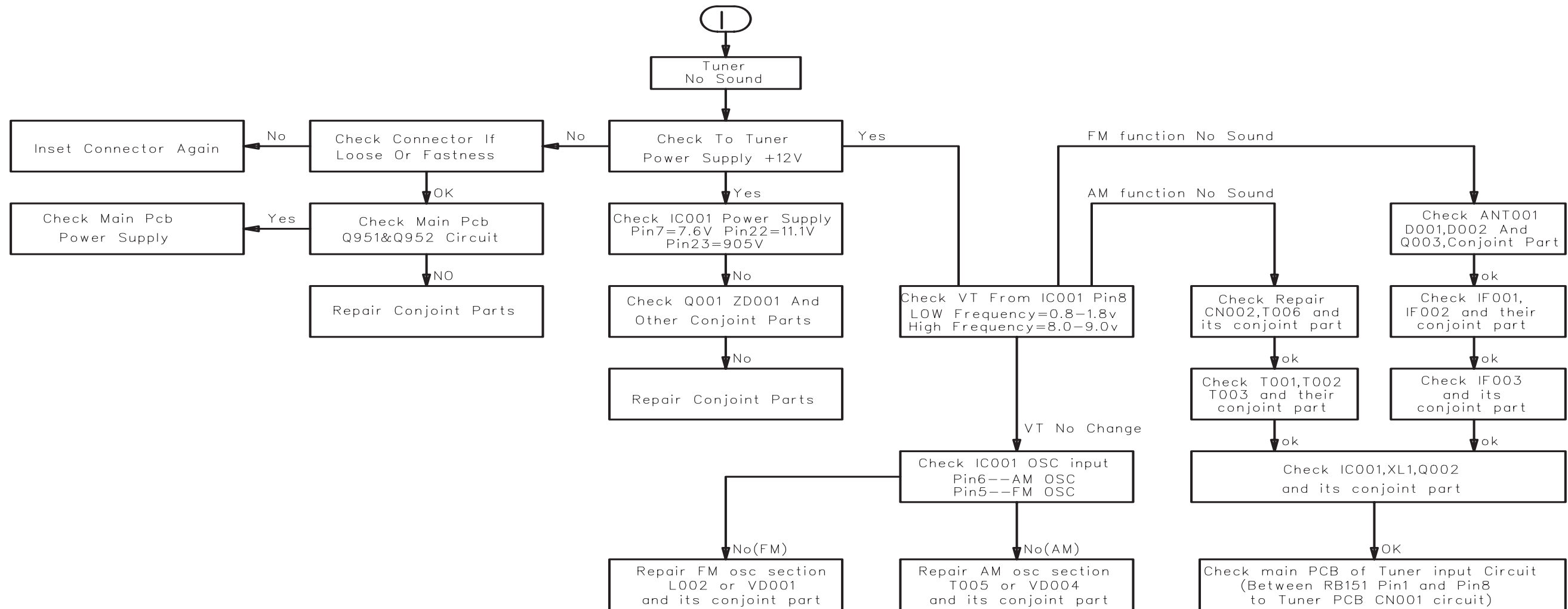
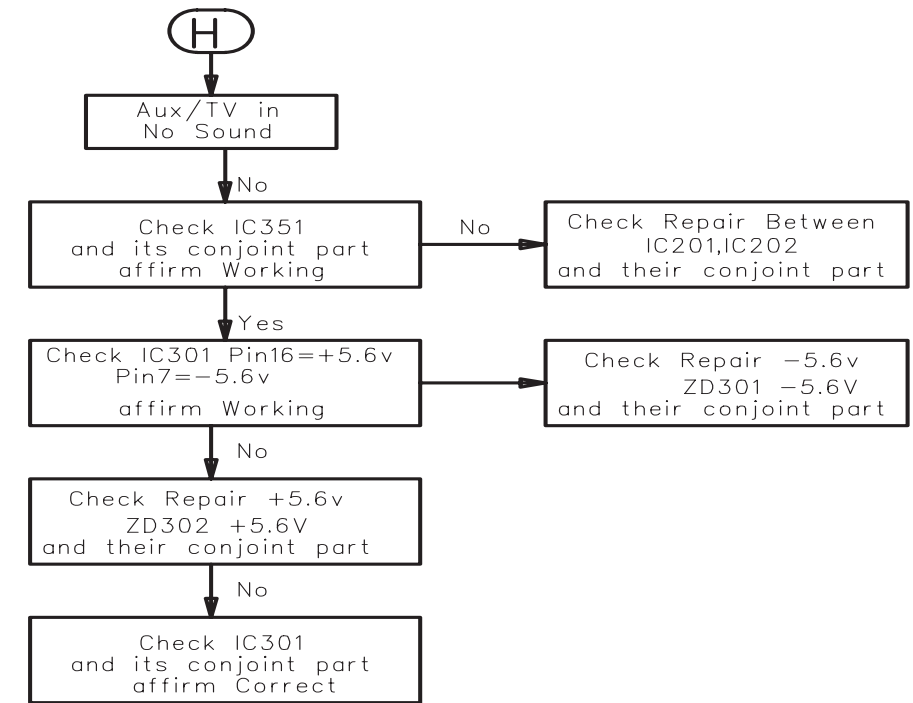
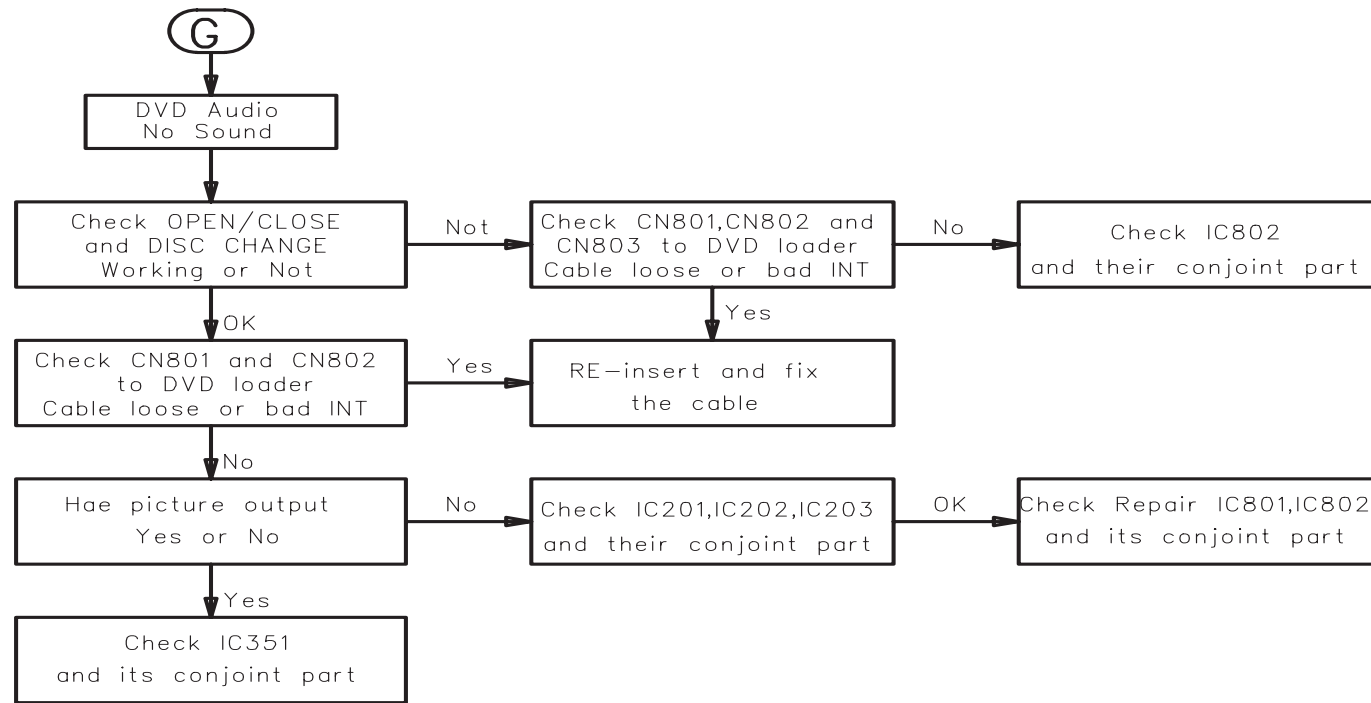
* The latest upgraded is in version VER0610.

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.

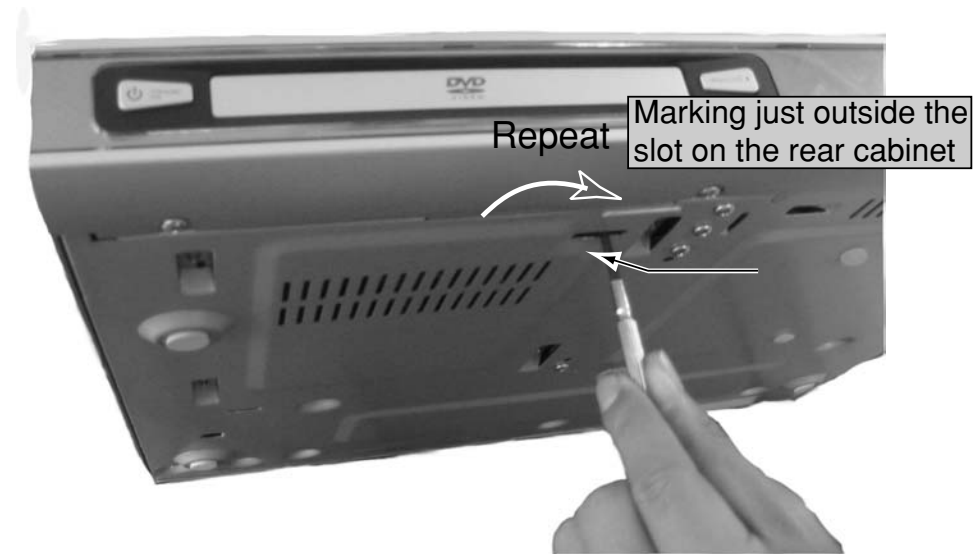


Figure 1



Figure 2

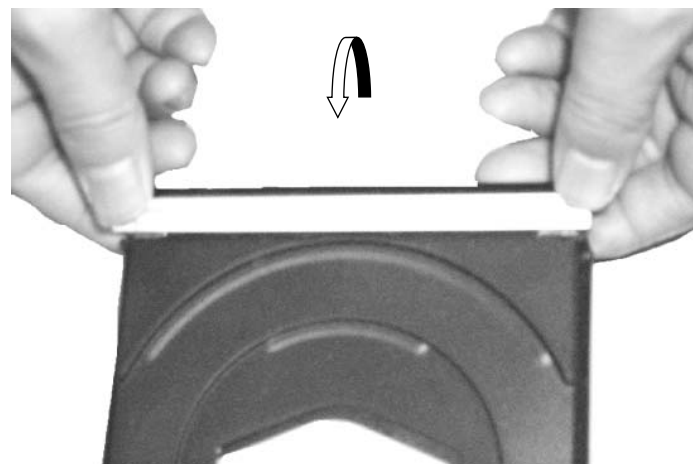


Figure 3

- 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

Dismantling of the DVD Module

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

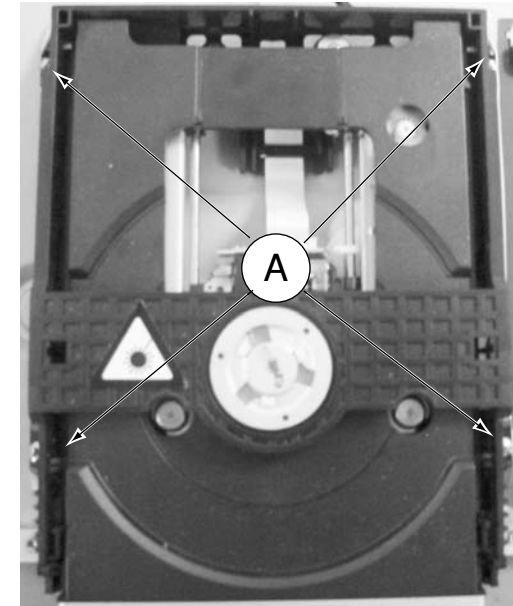


Figure 4

Dismantling of the Power Board

- 1) Loosen 4 screws "B" at the top of the Power Board as shown in figure 5

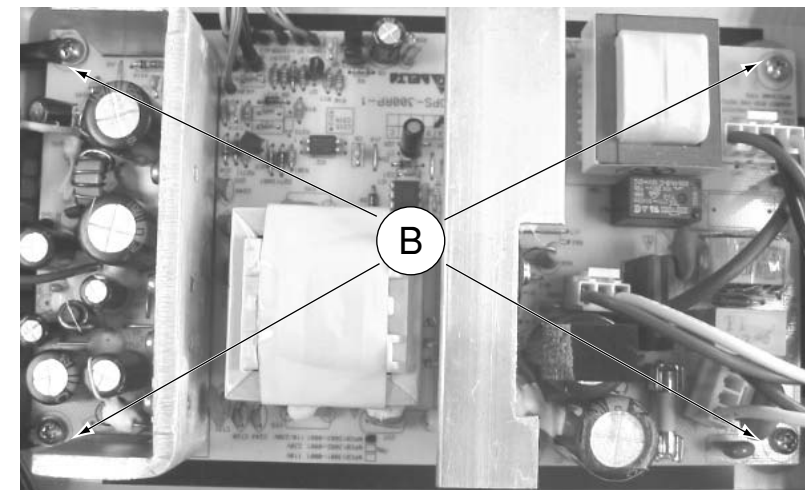


Figure 5

Dismantling of the Tuner PCB

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

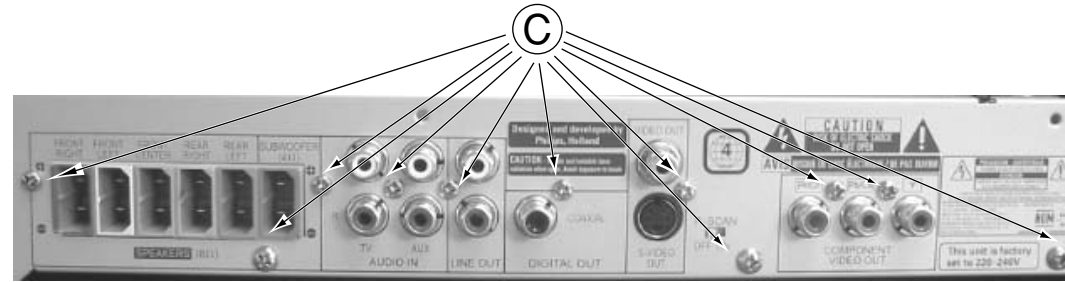


Figure 7



Figure 8

SERVICE POSITIONS

Service position A

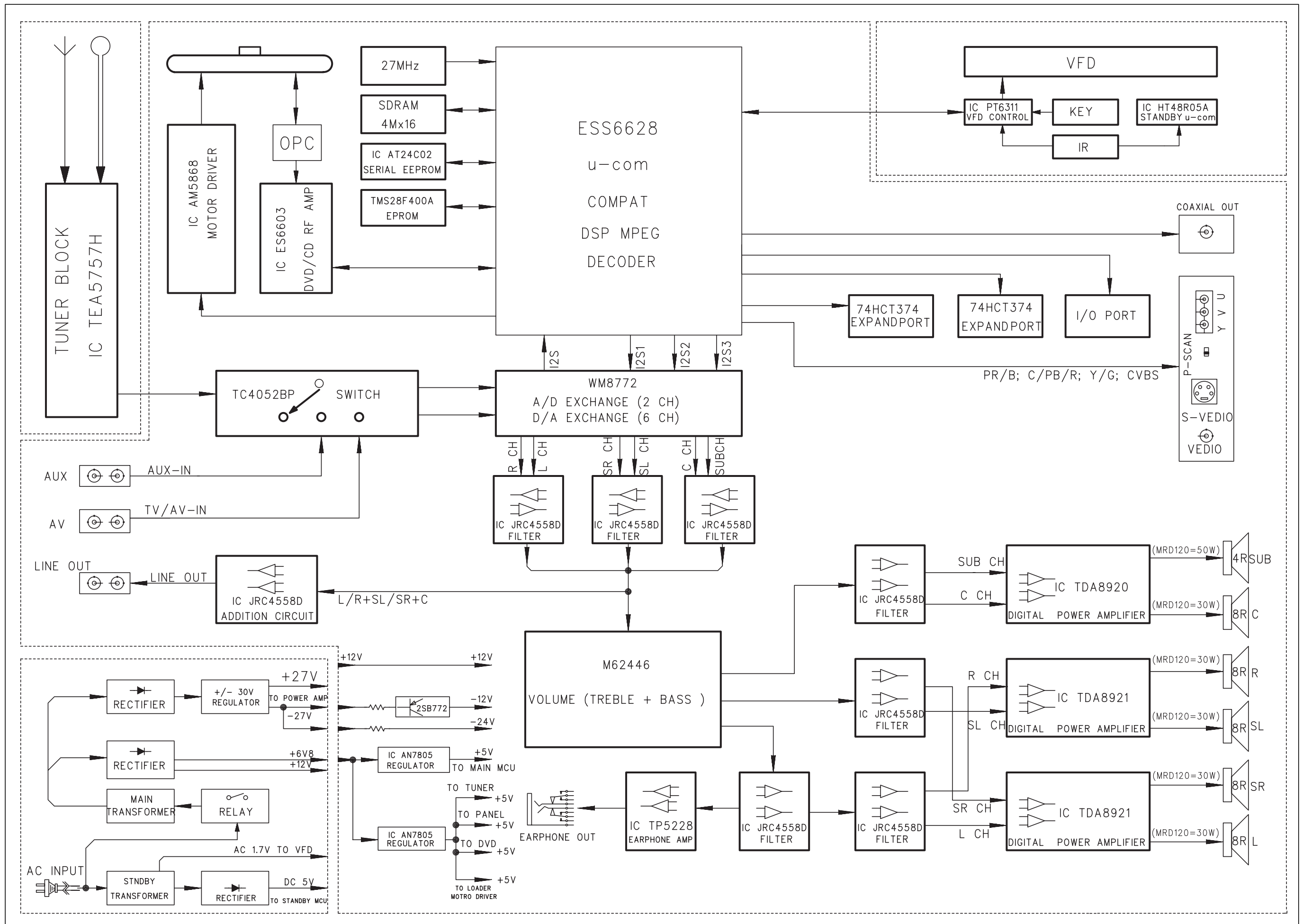


Note: In some service positions the components or copper patterns of one board may risk touching its neighbouring pc boards or metallic parts. To prevent such short-circuit use a piece of hard paper or other insulating material between them.

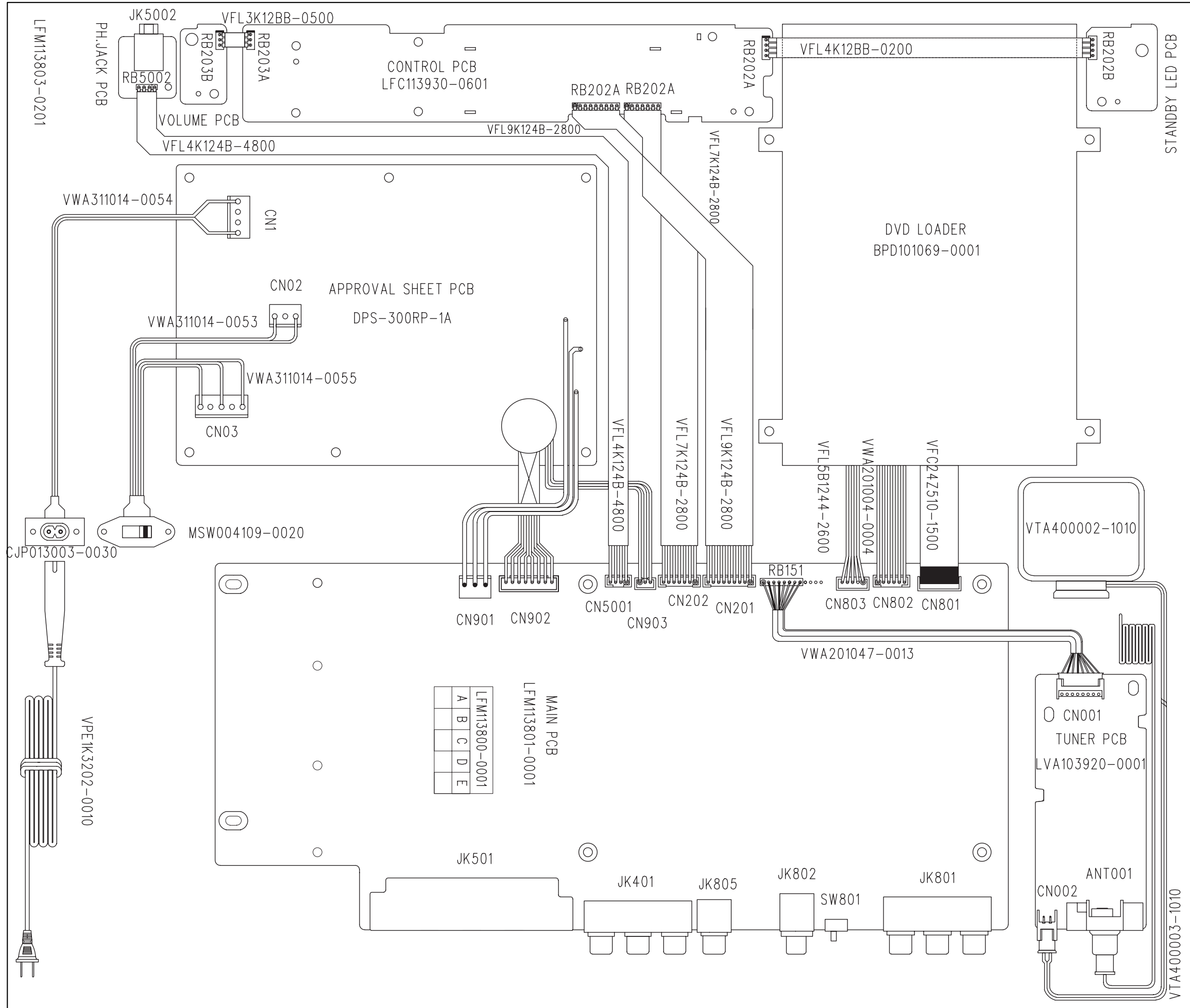
Service position B



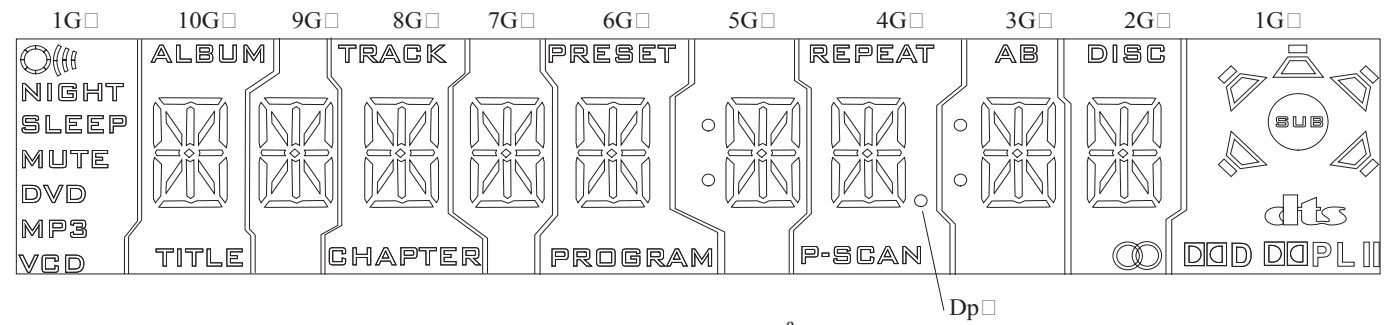
BLOCK DIAGRAM



WIRING DIAGRAM



FTD DISPLAY PIN ASSIGNMENT



KEY (CONTROL / STANDBY / VOL) BOARD

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FTD Display Pin Assignment 5-1
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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

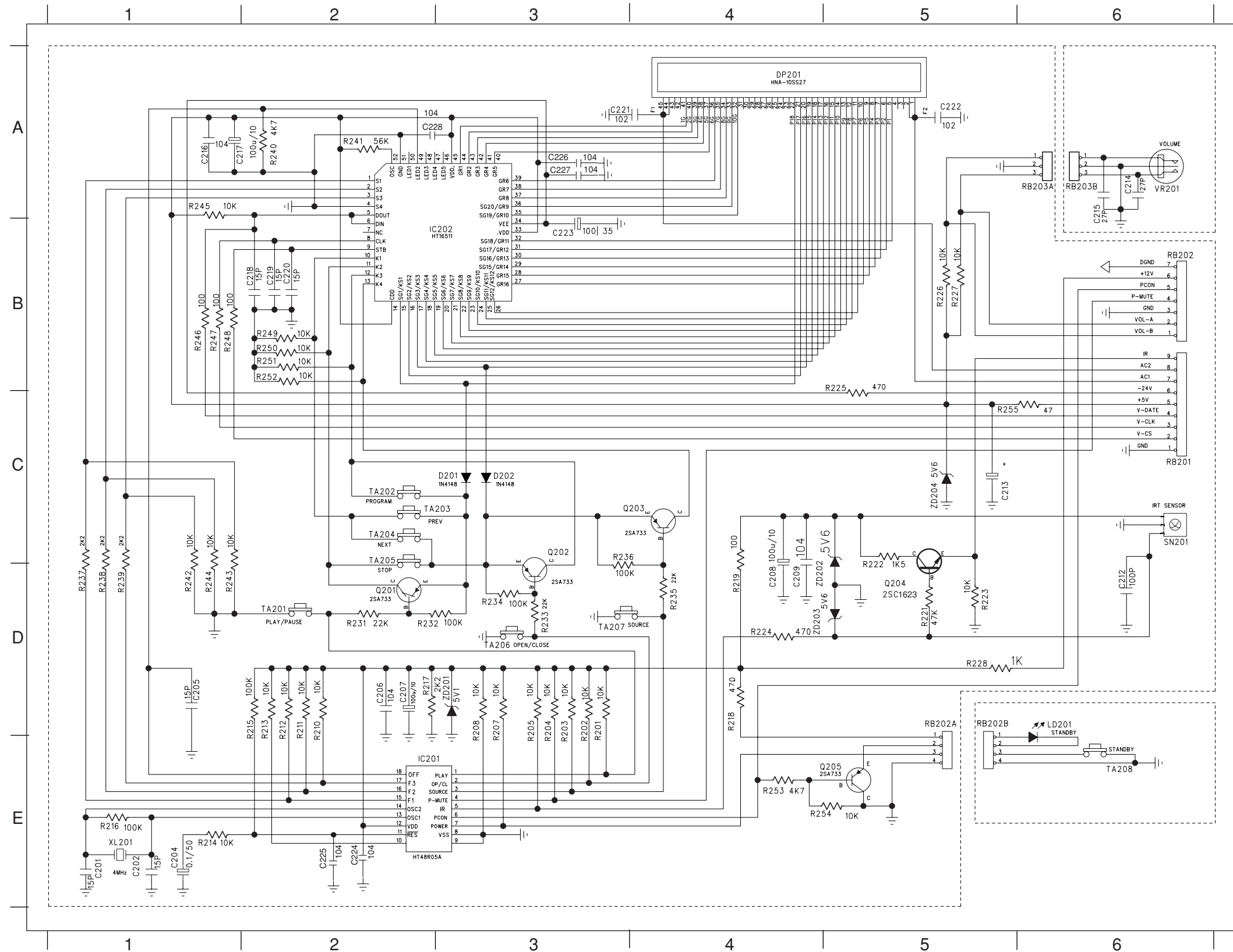
PIN CONNECTION

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

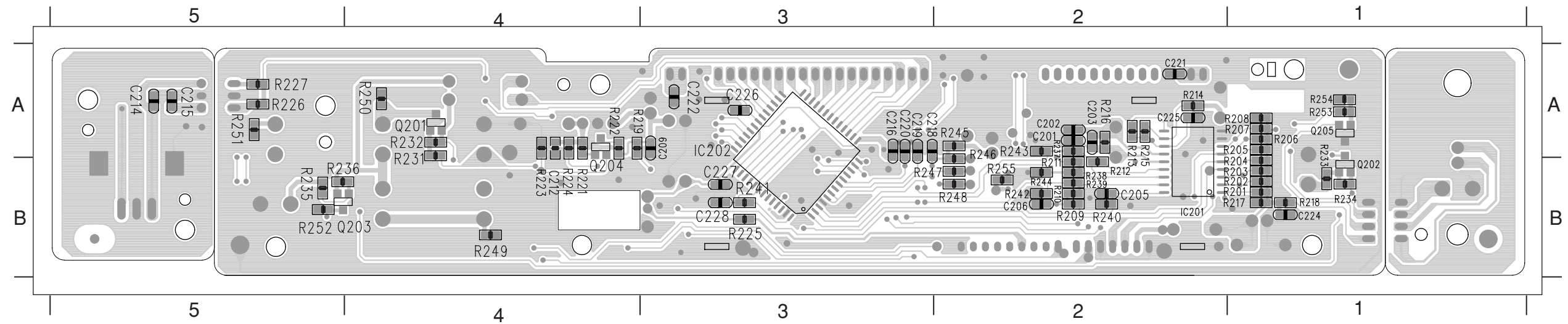
CIRCUIT DIAGRAM - KEY BOARD



C201	E1	R232	D2
C202	E1	R233	D3
C204	E1	R234	D3
C205	D1	R235	D4
C206	D2	R236	D3
C207	D2	R237	D1
C208	D4	R238	D1
C209	D4	R239	D1
C212	D6	R240	A2
C214	A6	R241	A2
C215	A6	R242	D1
C216	A1	R243	D1
C217	A1	R244	D1
C218	B2	R245	A1
C219	B2	R246	B1
C220	B2	R247	B1
C221	A3	R248	B1
C222	A5	R249	B2
C223	B2	R250	B2
C224	E2	R251	B2
C225	E2	R252	B2
C226	A3	R253	E4
C227	A3	R254	E5
C228	A2	R255	C6
D201	C3	RB201	C6
D202	C3	RB202	B6
DP201	A4	RB202A	D5
IC201	E2	RB202B	D5
IC202	B3	RB203A	A6
LD201	D6	RB203B	A6
Q201	D2	SN201	C6
Q202	D3	TA201	D2
Q203	C4	TA202	C2
Q204	D5	TA203	C2
Q205	E5	TA204	C2
R201	D3	TA205	C2
R202	D3	TA206	D3
R203	D3	TA207	D3
R204	D3	TA208	E6
R205	D3	VR201	A6
R207	D3	XL201	E1
R208	D3	ZD201	D3
R210	D2	ZD202	D4
R211	D2	ZD203	D4
R212	D2	ZD204	C5
R213	D2		
R214	E1		
R215	D2		
R216	E1		
R217	D2		
R218	D4		
R219	D4		
R221	D5		
R222	C5		
R223	D5		
R224	D4		
R225	C5		
R226	B5		
R227	B5		
R228	D5		
R231	D2		

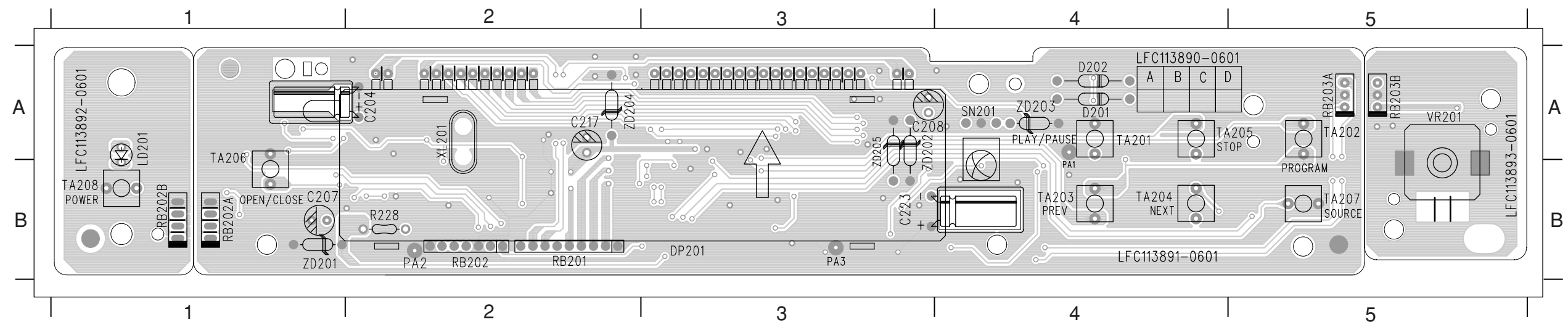
PCB LAYOUT - KEY BOARD (TOP)

C201	A2	C214	A5	C221	A2	C228	B3	Q204	B5	R205	A1	R213	A2	R219	A4	R226	A5	R235	B5	R241	B3	R247	B2	R253	A1
C202	A2	C215	A5	C222	A3	IC201	B2	Q205	A1	R207	A1	R214	A2	R221	B4	R227	A5	R236	B5	R242	B2	R248	B2	R254	A1
C205	B2	C216	A3	C224	B1	IC202	A3	R201	B1	R208	A1	R215	A2	R222	A4	R231	A4	R237	A2	R243	A2	R249	B4	R255	B2
C206	A2	C218	A3	C225	A2	Q201	A4	R202	B1	R210	B2	R216	A2	R223	B4	R232	A4	R238	B2	R244	B2	R250	A4		
C209	A3	C219	A3	C226	A3	Q202	B1	R203	B1	R211	B2	R217	B1	R224	B4	R233	B1	R239	B2	R245	A2	R251	A5		
C212	B4	C220	A3	C227	B3	Q203	B5	R204	A1	R212	B2	R218	B1	R225	B3	R234	B1	R240	B2	R246	A2	R252	B5		



PCB LAYOUT - KEY BOARD (BOTTOM)

C204	A2	D202	A4	RB202A	B1	TA202	A5	TA208	B1	ZD204	A2
C207	B1	DP201	B3	RB202B	B1	TA203	B4	VR201	A5		
C208	A3	LD201	A1	RB203A	A5	TA204	B4	XL201	A2		
C217	A2	R228	B2	RB203B	A5	TA205	A4	ZD201	B1		
C223	B3	RB201	B2	SN201	A4	TA206	B1	ZD202	A3		
D201	A4	RB202	B2	TA201	A4	TA207	B5	ZD203	A4		



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

MISCELLANEOUS

DP2201	9965 000 18031	VFD 100x25mm
LD2201	9965 000 17400	LED 3 DIA RED ROUND
SN2201	9965 000 23591	IRT RECEIV IRM-2038F4
TA2201	4822 276 13648	AI TACT SW SKHVBE3520 ALPS
TA2202	4822 276 13648	AI TACT SW SKHVBE3520 ALPS
TA2203	4822 276 13648	AI TACT SW SKHVBE3520 ALPS
TA2204	4822 276 13648	AI TACT SW SKHVBE3520 ALPS
TA2205	4822 276 13648	AI TACT SW SKHVBE3520 ALPS
TA2206	4822 276 13648	AI TACT SW SKHVBE3520 ALPS
TA2207	4822 276 13648	AI TACT SW SKHVBE3520 ALPS
TA2208	4822 276 13648	AI TACT SW SKHVBE3520 ALPS
VR2201	9965 000 23589	ENCODER L20 a=12 WITHOUT CC
XL2201	9965 000 23590	CRYSTAL4MHz HC-49US +/-15PPM

DIODES

D2201	4822 130 30621	1N4148
D2202	4822 130 30621	1N4148
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 18 PIN HT48R05A-1 SOPHOLTEK
IC2202	9965 000 20647	IC 52 PIN TP6311QH QFP TOPRO

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 (PT6311)																				
PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VOLTAGE	0	4.8	0	4.8	3.9	3.9	0	5	4.6	0	0	0	0	-27.8	-23.4	18.5	-30.5	-30.5	-30.5	-13.5
PIN	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
VOLTAGE	-28.8	-23.3	-28.2	-30.5	-28.2	-23.3	-22	-16.1	-17	-25.8	-29.3	-29	-29	-29	-29	-29	-29	-28.9	-29	-28.9
PIN	41	42	43	44	45	46	47	48	49	50	51	52								
VOLTAGE	-29	-28.9	-29.3	29.6	4.8	0	4.8	0	4.8	0	0	2.6								

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

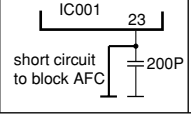
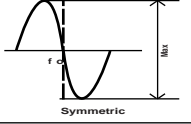
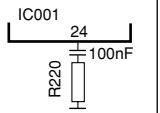
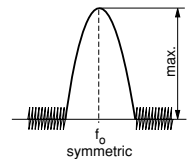
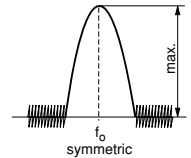
Q2202 (2SA733)			
PIN	1	2	3
VOLTAGE	5	0	5

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>						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check		6.5V ±0.2V
			87.5MHz	check		1.0V ±0.5V
AM 530-1710kHz (10kHz grid) (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>						
FM	10.7MHz, 50mV continuous wave			No need to adjust		
<i>FM - RF</i>						
FM	108MHz		106MHz	VC001	MAX	MAX
	87.5MHz	mod=1kHz Δf=±2.5kHz	90.1MHz	L001		
<i>AM IF</i>						
AM	450kHz			T001 T002	MAX	
AM AFC MW	Connect pin 29 of IC001 (AM Osc.) with short wire to ground (pin 6)	Δf = ±0.5kHz V _{RF} = 3mV		T003		
		ΔV=mV				
<i>AM RF ³⁾</i>						
MW	1404kHz		1404kHz	VC001	MAX	
	576kHz		612kHz	T006		
	1400kHz	Δf = ±30kHz V _{RF} as low as possible	1400kHz	VC002		
	610kHz		610kHz	T006		

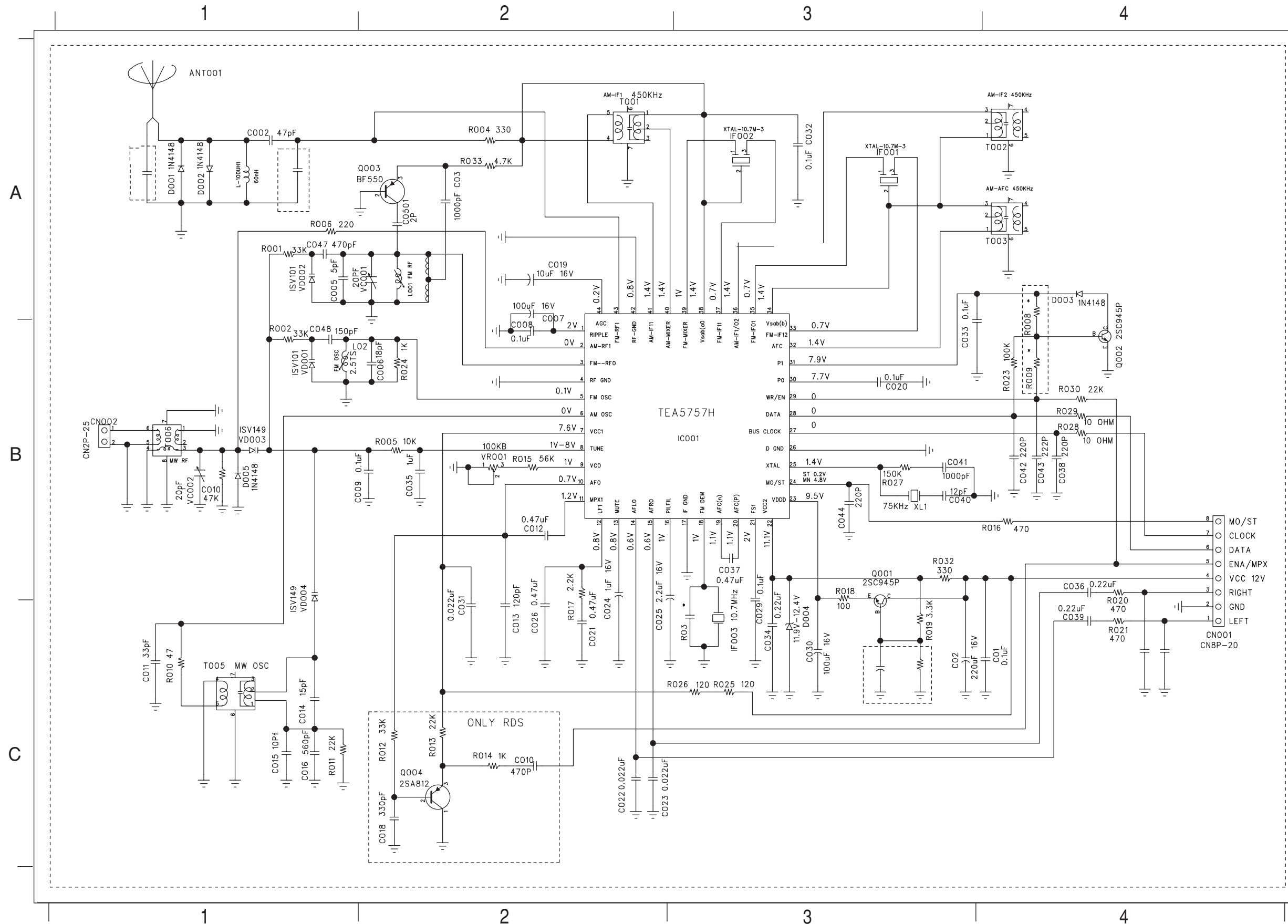
TUNER BOARD

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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!

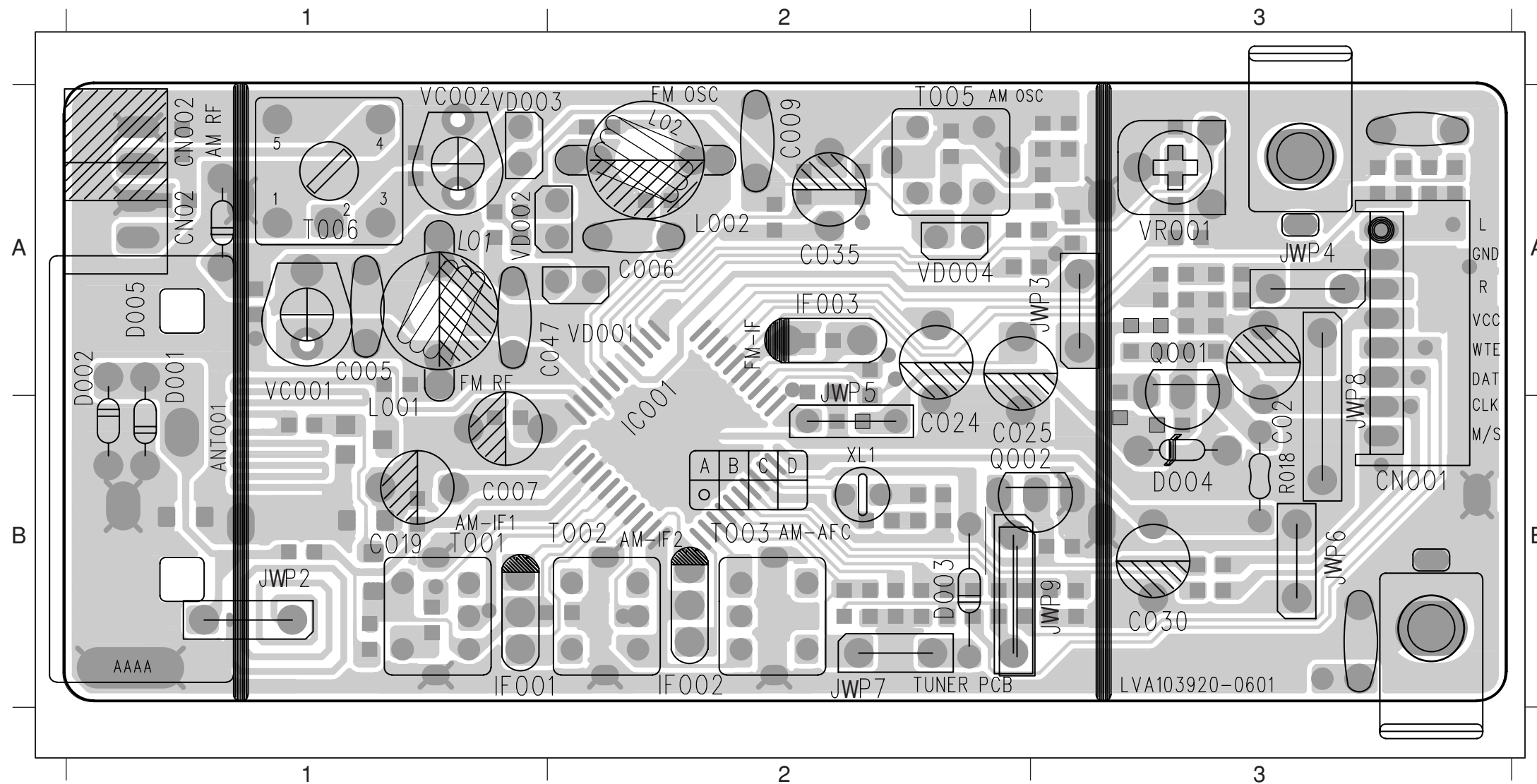
CIRCUIT DIAGRAM - TUNER BOARD



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		

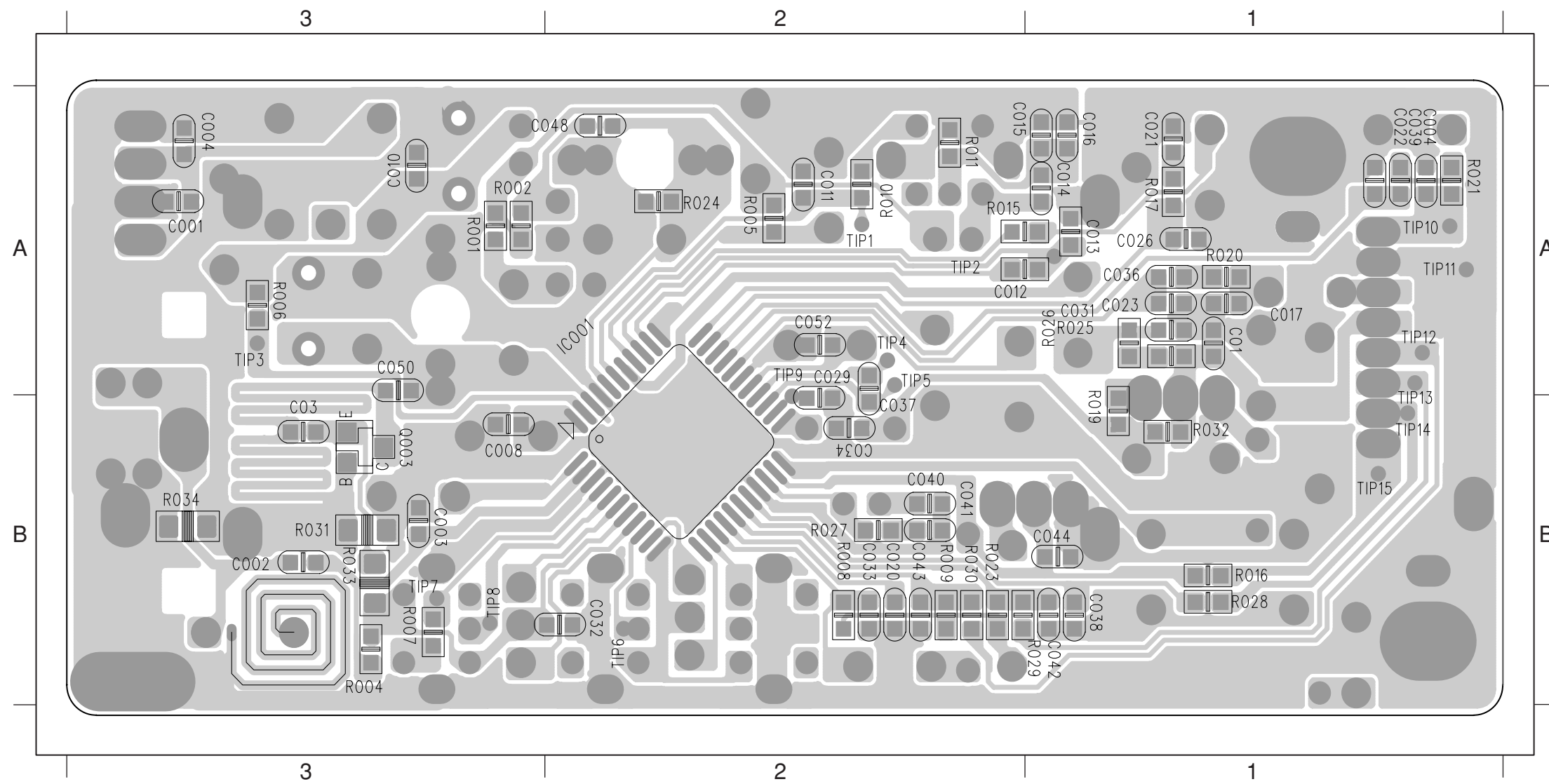
PCB LAYOUT - TUNER BOARD (TOP)

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 24668	RF JACK MALE TYPE 75 OHM
CN002	9965 000 25150	CONNECTOR S2B-XH-A 2P
IF001	9965 000 24669	CER FILTER 10.7MHz
IF002	9965 000 24670	CER FILTER 10.7MHz
IF003	9965 000 24671	CER FILTER CDA10.7MG-18A
L001	9965 000 23587	MOULDED COIL 2.5T 57-89nH
L02	9965 000 23586	SPRING COIL 0.8X4.5DX(1~2)2.5T
T001	9965 000 24672	AM IFT 450kHz 180pF Q=80MIN
T002	9965 000 24673	AM IFT 450kHz 180pF Q=80MIN
T003	9965 000 24673	AM IFT 450kHz 180pF Q=80MIN
T005	9965 000 24674	OSC COIL AM 120uH (796kHz)
T006	9965 000 24675	ANT OSC AM 4-6:10T 1-3:86T
VC001	9965 000 24676	CONDTRIM3-10pFNP0PB<1000PPM
VC002	9965 000 24676	CONDTRIM3-10pFNP0PB<1000PPM
VR001	9965 000 24677	CNTL TRIMR 50KB 30% P=5x5mm
XL1	9965 000 23588	CRYSTAL 75kHz +/-15 PPMCOLUMN

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 44 PIN TEA5757H QFP44

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

VOLTAGES

IC001 (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																

Q003 (BF550)

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

Q001 (2SC945)

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

Q002 (2SC945)

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

DVD LOADER

(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.

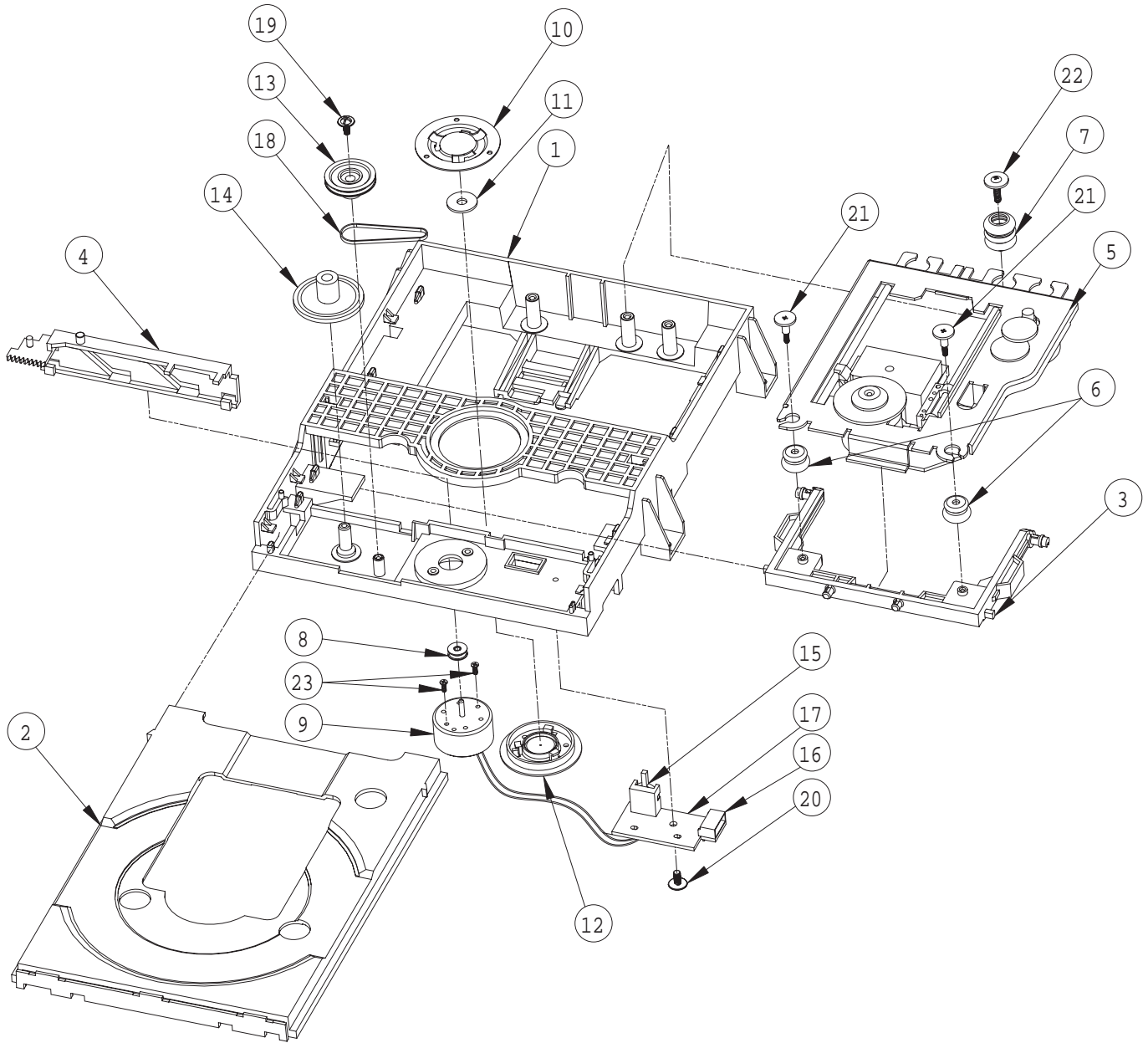
The only service part available for replacement is:

DVD MECH. LOADER ASSY 9965 000 23573

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Exploded View

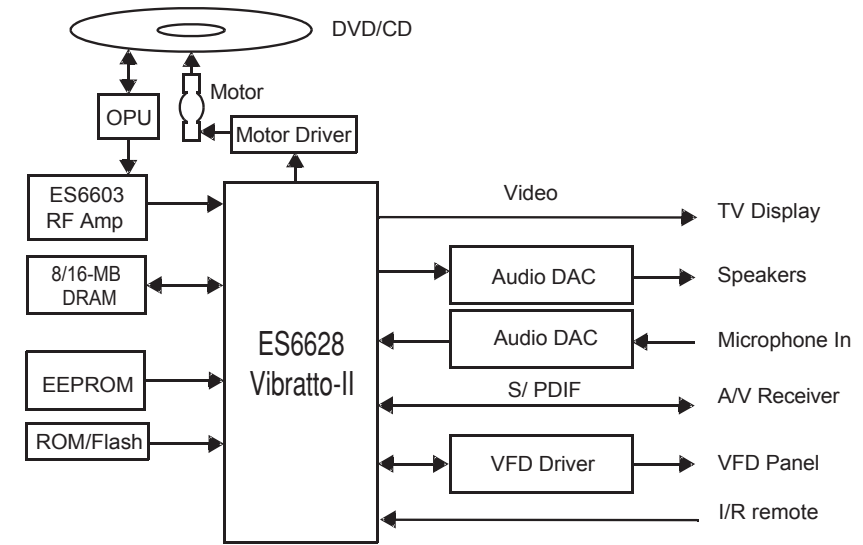


MAIN BOARD

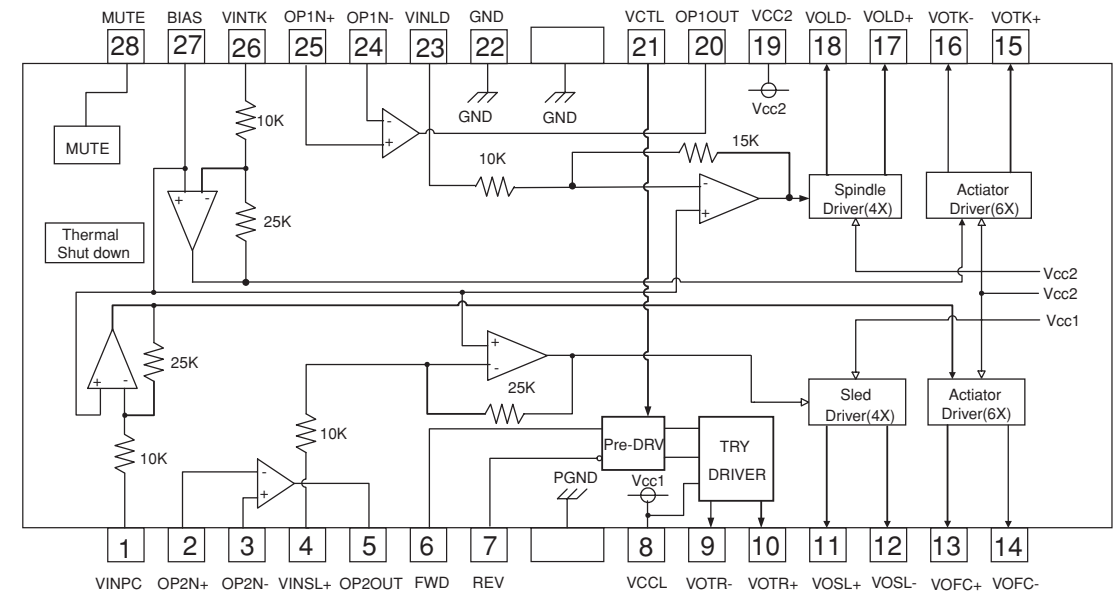
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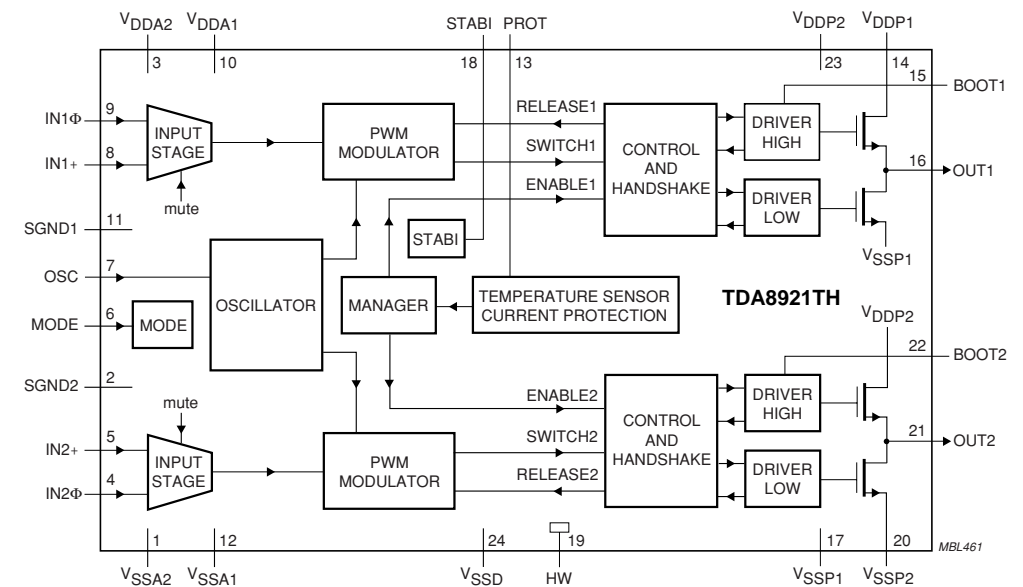
ES6628F INTERNAL IC DIAGRAM



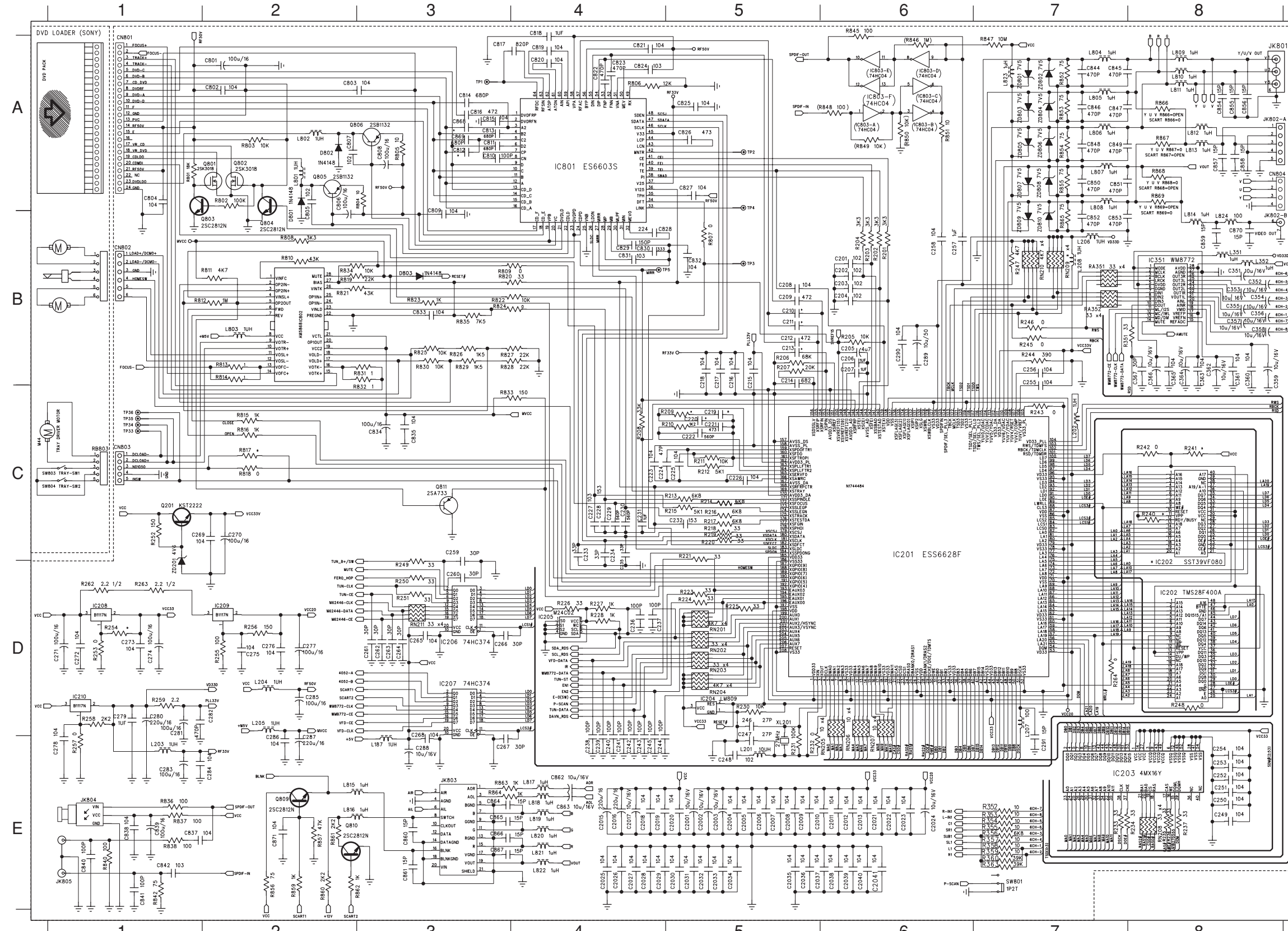
AM5868S INTERNAL IC DIAGRAM



TDA8921TH INTERNAL IC DIAGRAM



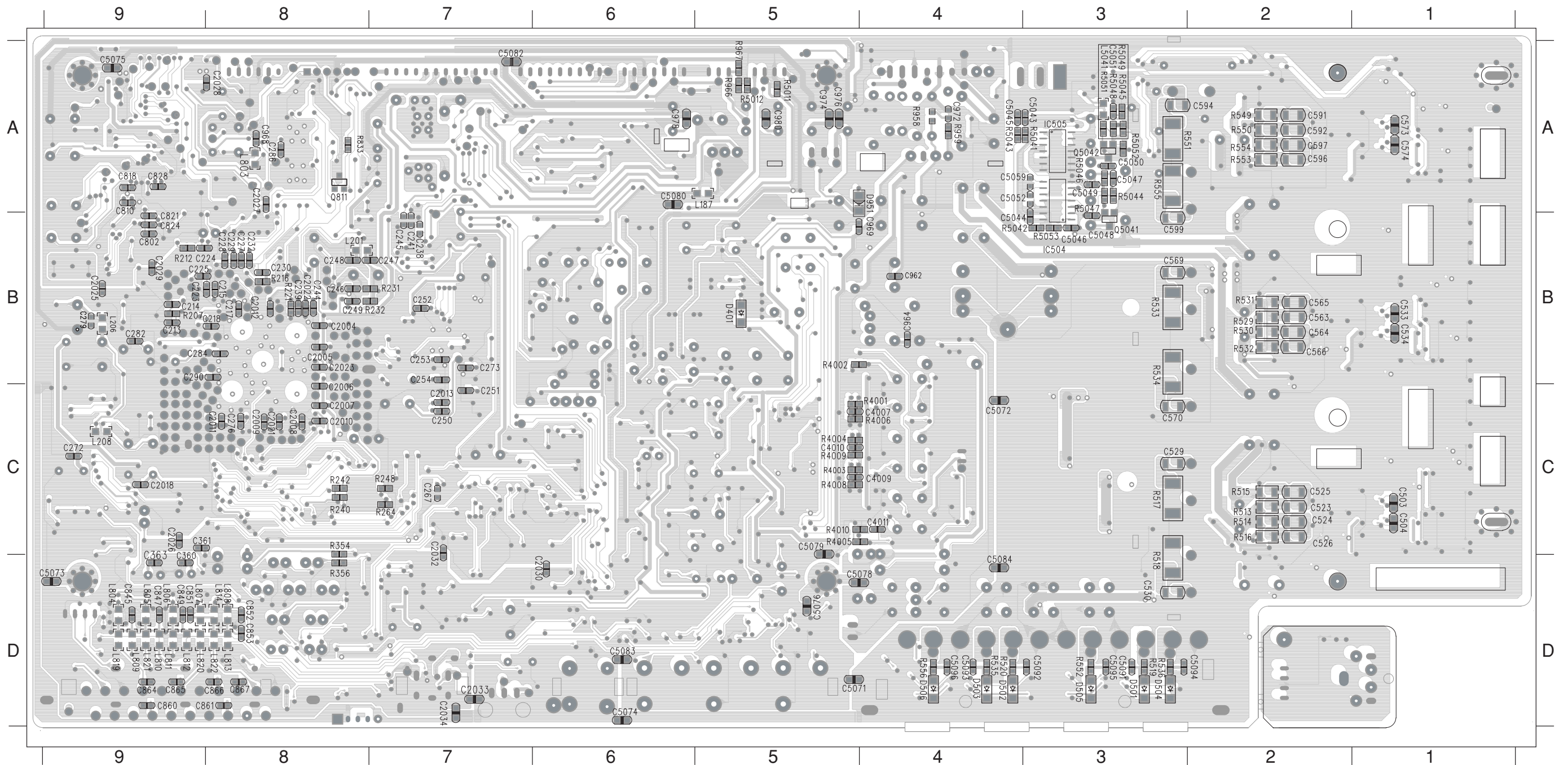
CIRCUIT DIAGRAM (1)- MAIN BOARD



C201	B6	C801	A2	IC801	A4	R801	A1
C202	B6	C802	A2	IC802	B2	R802	A2
C203	B6	C803	A3	JK801	A8	R803	A2
C204	B6	C804	A1	JK802-A	A8	R804	A3
C205	B6	C805	B2	JK802-B	E1	R805	A3
C206	B6	C806	A2	JK805	B8	R806	A4
C207	B6	C807	A2	L187	E3	R807	B5
C208	B5	C808	A3	L201	E5	R808	B2
C209	B5	C809	B3	L202	C7	R809	B2
C210	B5	C810	A3	L203	D1	R810	B2
C211	B5	C811	A3	L204	D2	R811	B2
C212	B5	C812	A3	L205	E2	R812	B2
C213	B5	C813	A3	L206	B7	R813	B2
C214	B5	C814	A3	L207	D7	R814	B2
C215	B5	C815	A3	L351	B8	R815	C2
C216	B5	C816	A3	L352	B8	R816	C2
C217	B5	C817	A4	L801	A2	R817	C2
C218	B5	C818	A4	L802	A2	R818	C2
C219	B5	C819	A4	L803	B2	R819	C2
C220	C5	C820	A4	L804	A7	R820	B3
C221	C5	C821	A4	L805	A7	R821	B3
C222	C5	C822	A4	L806	A7	R822	B3
C223	C4	C823	A4	L807	A7	R823	B3
C224	C4	C824	A4	L808	B7	R824	B3
C225	C4	C825	A5	L809	A8	R825	B3
C226	C4	C826	A5	L810	A8	R826	B3
C227	C4	C827	A5	L811	A8	R827	B3
C228	C4	C828	B4	L812	A8	R828	B4
C229	C4	C829	B4	L813	A8	R829	B3
C230	C4	C830	B4	L814	B8	R830	B3
C231	C4	C831	B4	L815	B8	R831	B3
C232	C4	C832	B5	L816	A7	R832	B3
C233	D4	C833	B3	Q801	A2	R833	C3
C234	D4	C834	C3	Q802	A2	R834	C3
C235	D4	C835	C3	Q803	B2	R835	C3
C236	D4	C836	E2	Q804	B2	R836	E1
C237	D4	C837	E1	Q805	A2	R837	E1
C238	D4	C838	E1	Q806	A3	R838	A6
C239	D4	C839	A7	Q811	C3	R839	A6
C240	D4	C840	A7	R201	B6	R840	A7
C241	D4	C841	A7	R202	B6	R841	A7
C242	D4	C842	A7	R203	B6	R842	A7
C243	D4	C843	A7	R204	B6	R843	A7
C244	D6	C844	A7	R205	B6	R844	A7
C245	D6	C845	A7	R206	B5	R845	A7
C246	D6	C846	A7	R207	B5	R846	A7
C247	D6	C847	A7	R208	C4	R847	A7
C248	E5	C848	A7	R209	C5	R848	A7
C249	E8	C849	A7	R210	C5	R849	A7
C250	E8	C850	A7	R211	C5	R850	A7
C251	E8	C851	A7	R212	C5	R851	A7
C252	E8	C852	A7	R213	C5	R852	A7
C253	E8	C853	A7	R214	C5	R853	A7
C254	E8	C854	A7	R215	C5	R854	A7
C255	B7	C855	A8	R216	C5	R855	A7
C256	B7	C856	A8	R217	C5	R856	A7
C257	B6	C857	A8	R218	C5	R857	A7
C258	C3	C858	B8	R219	C5	R858	A7
C259	C3	C859	B8	R220	C5	R859	A7
C260	D3	C2001	E5	R221	C5	R860	A7
C261	D3	C2002	E5	R222	C5	R861	A7
C262	D3	C2003	E5	R223	C5	R862	A7
C263	D3	C2004	E5	R224	C5	R863	A7
C264	D3	C2005	E5	R225	C5	R864	A7
C265	D3	C2006	E5	R226	C5	R865	A7
C266	D3	C2007	E5	R227	C5	R866	A7
C267	E3	C2008	E5	R228	C5	R867	A7
C268	D3	C2009	E6	R229	C5	R868	A7
C269	C2	C2010	E6	R230	C5	R869	A7
C270	C2	C2011	E6	R231	C5	R870	A7
C271	D1	C2012	E6	R232	C5	R871	A7
C272	D1	C2013	E6	R233	C5	R872	A7
C273	D1	C2014	E6	R234	C5	R873	A7
C274	D1	C2015	E6	R235	C5	R874	A7
C275	D1	C2016	E6	R236	C5	R875	A7
C276	D2	C2017	E5	R237	C5	R876	A7
C277	D2	C2018	E5	R238	C5	R877	A7
C278	E1	C2019	E5	R239	C5	R878	A7
C279	D1	C2020	E5	R240	C5	R879	A7
C280	D1	C2021	E6	R241	C5	R880	A7
C281	D1	C2022	E6	R242	C5	R881	A7
C282	E2	C2023	E6	R243	C5	R882	A7
C283	E1	C2024	E6	R244	C5	R883	A7
C284	E2	C2025	E6	R245	C5	R884	A7
C285	E2	C2026	E6	R246	C5	R885	A7
C286	E2	C2027	E6	R247	C5	R886	A7
C287	E2	C2028	E6	R248	C5	R887	A7
C288	E2	C2029	E6	R249	C5	R888	A7
C289	E3	C2030	E6	R250	C5	R889	A7
C290	B6	C2031	E6	R251	C5	R890	A7
C291	B6	C2032	E6	R252	C5	R891	A7
C351	B8	CN801	A1	R253	D1	R892	D2
C352	B8	CN802	B1	R254	D1	R893	D1
C353	B8	CN803	C1	R255	D1	R894	D1
C354	B8	D801	B2	R256	D1	R895	D1
C355	B8	D802	A2	R257	D1	R896	D1
C356	B8	D803	B3	R258	D1	R897	D1
C357	B8	D804	C3	R259	D1	R898	D1
C358	B8	D805	C6	R260	D1	R899	D1
C359	B8	D806	C7	R261	D1	R900	D1
C360	B8	D807	D4	R262	D1	R901	D1
C361	B8	D808	D6	R263	D1	R902	D1
C362	B8	D809	D3	R264	D1	R903	D1
C363	B8	D810	D3	R265	D1	R904	D1
C364	B8	D811	D1	R266	D1	R905	D1
C365	B8	D812	D1	R267	D1	R906	D1
C366	B8	D813	D1	R268	D1	R907	D1
C367	B7	IC351	B8	R269	D1	R908	D1

PCB LAYOUT - MAIN BOARD (BOTTOM)

C214	B9	C239	B8	C267	C7	C504	C1	C569	B3	C821	B9	C972	A4	C2012	B8	C4007	C4	C5052	A4	C5084	D4	L808	D8	R221	B8	R529	B2	R958	A4	R5011	A5
C215	B8	C241	B7	C272	C9	C523	C2	C570	C3	C824	B9	C974	A5	C2013	C7	C4009	C4	C5059	A4	D951	A4	L809	D9	R231	B7	R530	B2	R959	A4	R5012	A5
C217	B8	C244	B8	C273	B7	C524	C2	C573	A1	C828	A9	C976	A5	C2018	C9	C4010	C5	C5071	D5	IC504	B3	L810	D9	R232	B7	R531	B2	R966	A5	R5041	A3
C218	B8	C245	B7	C276	C8	C525	C2	C574	A1	C845	D9	C978	A6	C2021	C8	C4011	C4	C5072	C4	IC505	A3	L811	D9	R242	C8	R532	B2	R967	A5	R5042	B3
C223	B8	C246	B8	C279	B9	C526	C2	C591	A2	C847	D9	C980	A5	C2022	B8	C5043	A1	C5073	D9	L187	A5	L812	D9	R248	C7	R533	B3	R4001	C4	R5043	A4
C224	B8	C247	B7	C282	B9	C529	C3	C592	A2	C849	D9	C2004	B8	C2023	B8	C5044	A4	C5074	D6	L201	B8	L813	D8	R354	C8	R534	B3	R4002	B5	R5044	A3
C225	B9	C248	B8	C284	B8	C530	D3	C594	A2	C851	D9	C2005	B8	C2025	B9	C5045	A4	C5075	A9	L206	B9	L814	D8	R356	D8	R549	A2	R4003	C5	R5045	A3
C227	B8	C249	B8	C286	A8	C533	B1	C596	A2	C852	D8	C2006	C8	C2026	C9	C5046	B3	C5076	D5	L208	C9	Q5041	B3	R513	C2	R550	A2	R4004	C5	R5046	A3
C228	B8	C250	C7	C290	B8	C534	B1	C597	A2	C853	D8	C2007	C8	C2027	A8	C5047	A3	C5078	D5	L803	A8	Q5042	A3	R514	C2	R551	A3	R4005	C5	R5047	B3
C229	B8	C251	C7	C360	D9	C563	B2	C599	B3	C962	B4	C2008	C8	C2028	A8	C5048	B3	C5079	C5	L804	D9	Q811	A8	R515	C2	R553	A2	R4006	C4	R5048	A3
C230	B8	C252	B7	C361	C8	C564	B2	C802	B9	C964	B4	C2009	C8	C2029	B9	C5049	A3	C5080	A6	L805	D9	R207	B9	R516	C2	R554	A2	R4008	C5	R5049	A3
C232	B8	C253	B7	C363	D9	C565	B2	C810	B9	C968	A8	C2010	C8	C2030	D6	C5050	A3	C5082	A7	L806	D9	R212	B9	R517	C3	R555	A3	R4009	C5		
C238	B7	C254	C7	C503	C1	C566	B2	C818	A9	C969	B4	C2011	C8	C2032	C7	C5051	A3	C5083	D6	L807	D8	R216	B8	R518	D3	R833	A8	R4010	C5		



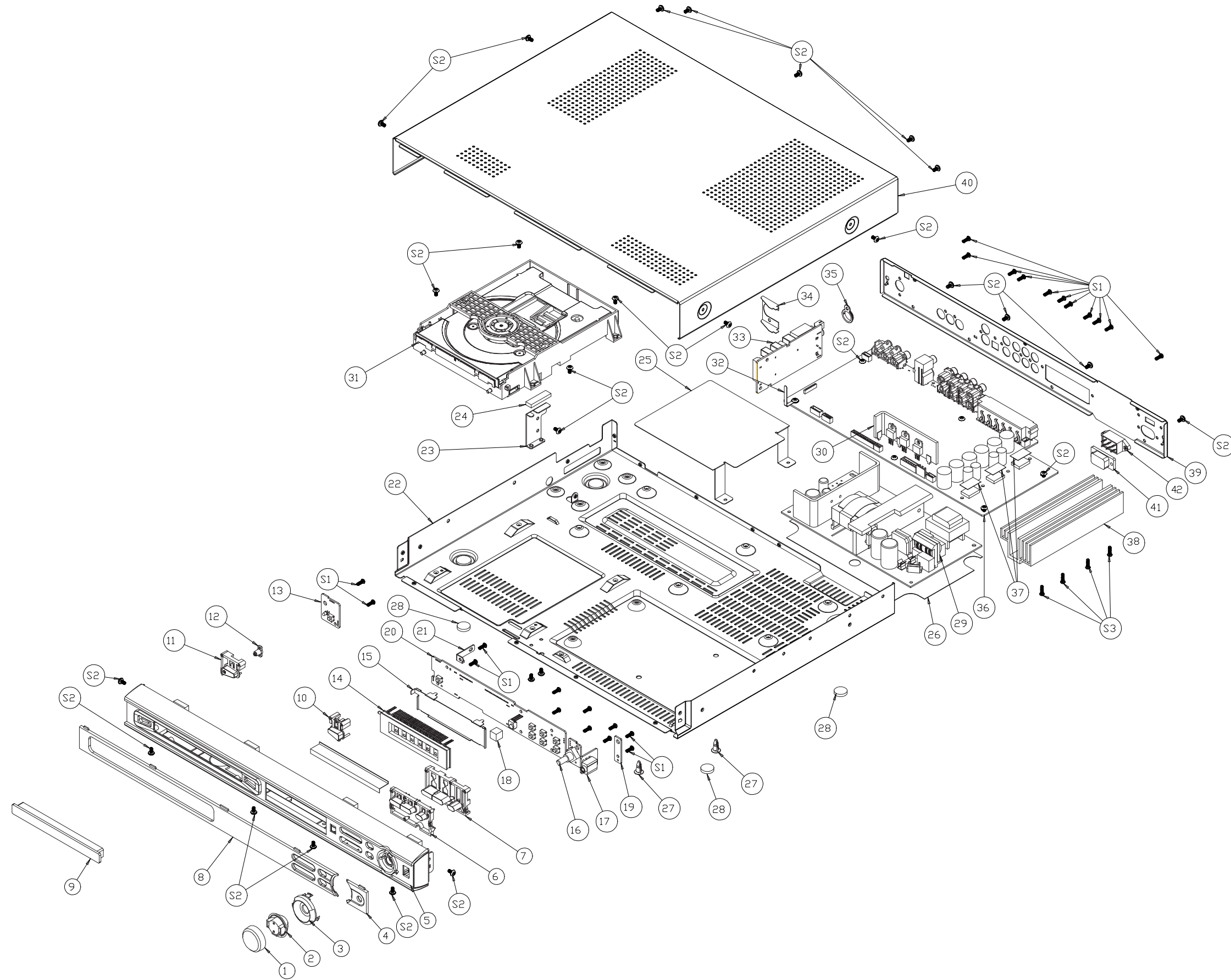
ELECTRICAL PARTS LIST - MAIN BOARD

TRANSISTORS & INTEGRATED CIRCUITS

IC407	9965 000 15886	IC 8 PIN RC4558D
IC408	9965 000 15886	IC 8 PIN RC4558D
IC409	9965 000 15886	IC 8 PIN RC4558D
IC501	9965 000 23618	IC 24PIN TDA8921TH HSOP24
IC502	9965 000 23618	IC 24PIN TDA8921TH HSOP24
IC503	9965 000 23618	IC 24PIN TDA8921TH HSOP24
IC504	9965 000 22230	IC 14 PIN 74LVC04AD
IC505	9965 000 22229	IC 14 PIN HEF4013BT
IC801	9965 000 21182	IC 64 PIN ES6603S LQFP ESS
IC802	9965 000 23620	IC 28 PIN AM5868S HSOP AMTEK
IC953	9965 000 12512	IC 3 PIN BA05T TO220FP ROHM
IC954	9965 000 12512	IC 3 PIN BA05T TO220FP ROHM
IC5001	9965 000 23621	IC8PAPA3541 SOP-8 HEADPHONE

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

MECHANICAL EXPLODED VIEW



MECHANICAL & ACCESSORIES PARTS LIST - MAIN UNIT

	9965 000 24683	MAIN+PH JACK+PH BKT+RGB PCBA
	9965 000 24684	CONTROL PCB ASSY
	9965 000 24658	RADIO (TUNER) PCB ASSY
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 24685	FRONT PANNEL
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
28	9965 000 23571	FOOT RUBBER
29	9965 000 25165	SW PWR SUP ASSY INPUT 110~230V
31	9965 000 23573	DVD MECH. LOADER ASSY
35	9965 000 23575	ANTENNA HOLDER
41	9965 000 20576	△ AC SOCKET SO-222-PC-S(TECX)
42	9965 000 16339	SWITCH SLIDE 6 PIN SL14-22AH
	9965 000 25159	SATELLITE SPEAKER ASSY 30Wx5
	9965 000 25160	SUBWOOFER ASSY 50W
	9965 000 23578	FFC WIRE 24P L=150mm P=0.5mm
	9965 000 24688	△ LINE CORD
	9965 000 23580	RCA CABLE (VIDEO CABLE)
	9965 000 23889	RCA CABLE (AUDIO CABLE)
	9965 000 23582	LOOP ANTENNA
	9965 000 23583	FM ANTENNA
	9965 000 23656	REMOTE CONTROL
	9965 000 25158	CONVERSION PLUG SAA TO 2 FLAT PIN
	9965 000 25163	BEAD FERIT OD28xID16xH20mm BLK

SATELLITE SPEAKER ASSY BREAKDOWN

	9965 000 24689	SPEAKER BOX FRONT-L
	9965 000 24690	SPEAKER BOX FRONT-R
	9965 000 24691	SPEAKER BOX REAR-L
	9965 000 24692	SPEAKER BOX REAR-R
	9965 000 24693	SPEAKER BOX CENTER
	9965 000 23627	RUBBER FOOT

SCREW LISTS - MAIN UNIT

S1	D3 x 8
S2	M3 x 6
S3	D3 x 10

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

POWER BOARD

(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.

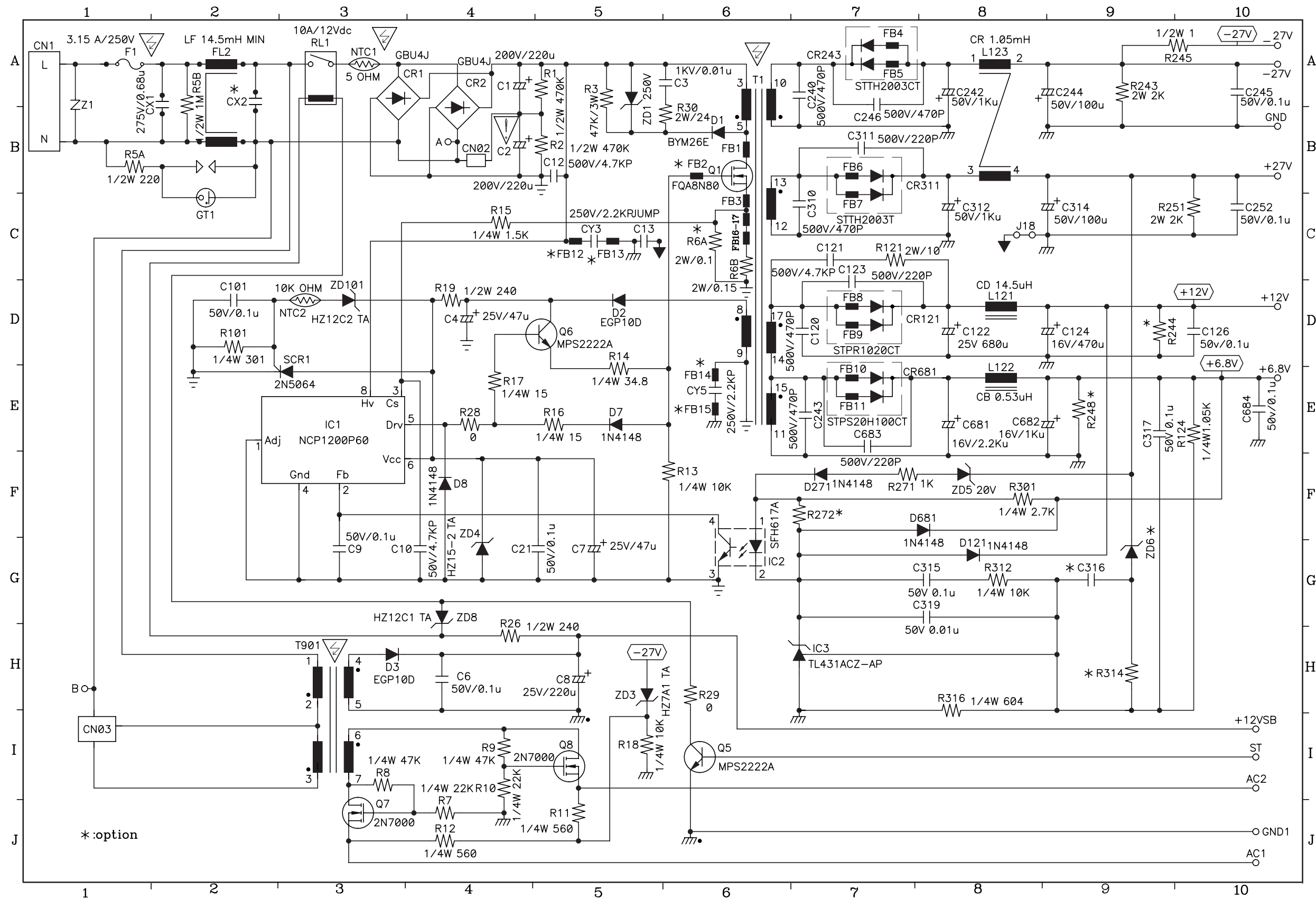
The only service part available for replacement is:

SW PWR SUP ASSY INPUT 110 ~ 230V 9965 000 25165

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CIRCUIT DIAGRAM - POWER BOARD (/78)



PCB LAYOUT - POWER BOARD (/78)

