DVD Mini System

FWD872/55/98

Service
Service
Service

Service Manual

TABLE OF CONTENTS

CLASS 1
LASER PRODUCT

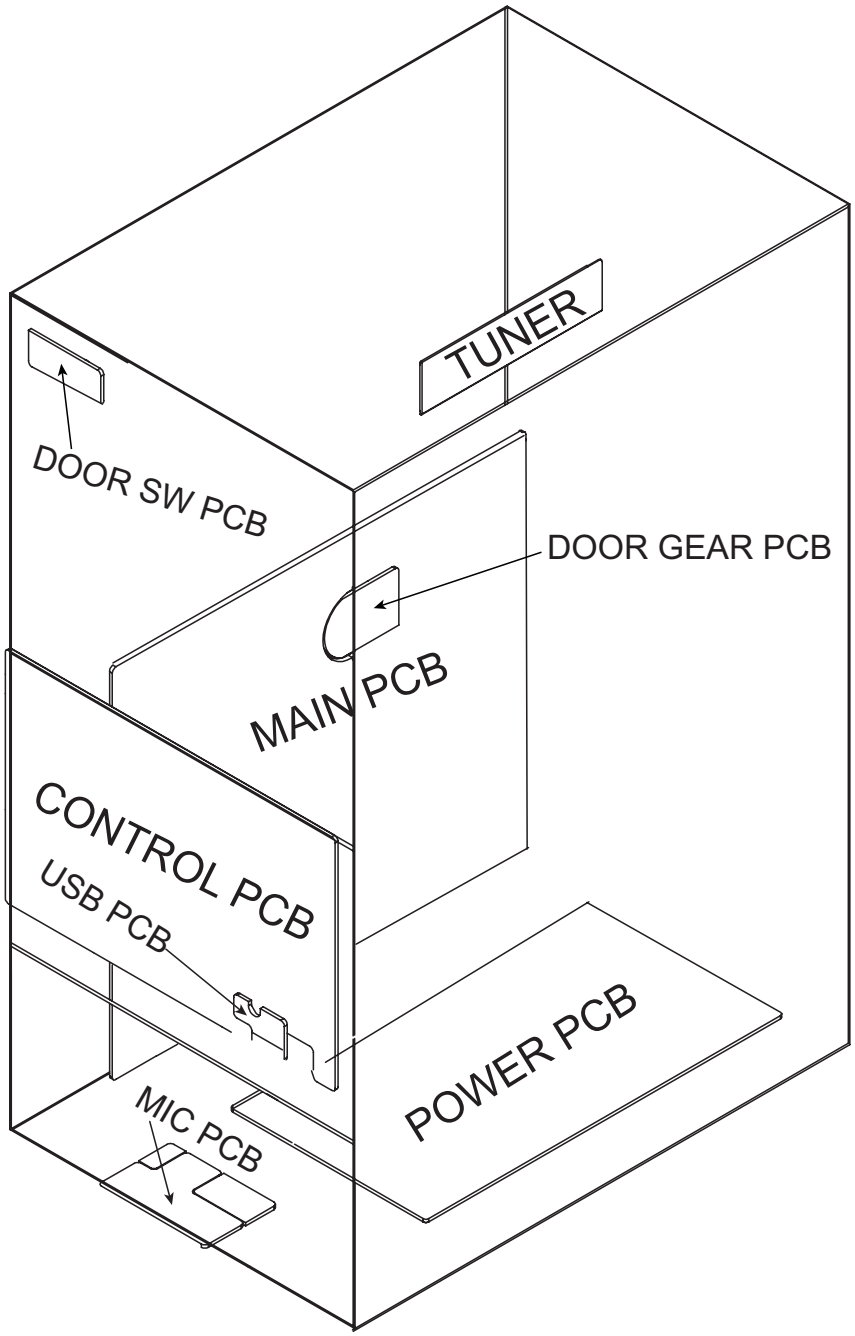
Published by SL-ET 0650 Service Audio Printed in The Netherlands Subject to modification

GB 3141 785 31181

Version 1.1

PHILIPS

LOCATION OF PCB BOARDS



VERSION VARIATION:

Type / Versions: / Features & Board in used	FWD872 /98
Main (output power -200W)	X
Composite video out	X
Power voltage (110 ~ 127 - 220~240v) Dual voltage	X
AC cord (detachable)	X

Specifications

AMPLIFIER SECTION

Total output power ..... 2600W PMPO
Main set ..... 2x100 W RMS
Main speaker L/R ..... 2x120 W RMS
Frequency Response . 150 Hz - 18 kHz / ± 3 dB
Signal-to-Noise Ratio ..... > 62dB (A-weighted)
Input Sensitivity
AUX In ..... 500 mV

TUNER SECTION

Tuning Range .....
..... FM 87.5 – 108 MHz (50 kHz steps)
..... MW 531 – 1602 kHz (9 kHz steps)
..... MW 530 – 1710 kHz (10 kHz steps)
Signal-to-Noise Ratio ..... FM ≥ 50 dB
..... MW ≥ 35 dB

TAPE SECTION

Frequency Response
Normal tape (type 1) ..... 80-12500 Hz
Signal-to-Noise Ratio
Normal tape (type 1) ..... ≥ 46 dBA
Wow and flutter ..... ≥ 0.35%

DVD 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 - 0.714 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)

MAIN UNIT

..... 60/50HZ Switchable
Power Consumption
Active ..... 200 W
Standby ..... <10 W
Dimensions (w × h × d) ... 190.6× 411.8 × 315.2 (mm)
Weight ..... 5.5 kg
Packaging Dimensions (w × h × d) .....
..... 565 x 627 x 397 (mm)
Power Supply Rating ..... 110 - 127 / 220 - 240 V
Gross weight 21.5Kg

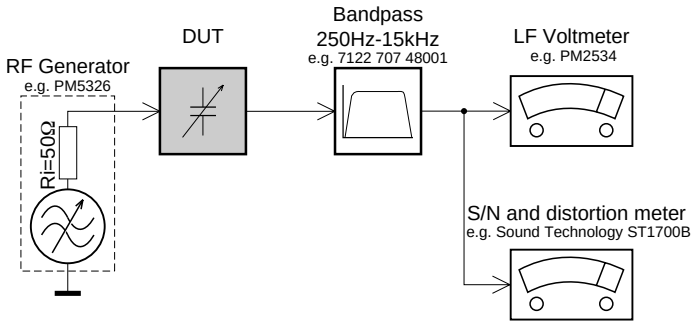
SPEAKERS

Front speakers
System ..... 2-way, Bass reflex
Impedance ..... 3 Ω
Speaker drivers ..... 5.25" woofer on body
..... 2" tweeter on body
..... 3" tweeter on tunable spk
Frequency response ..... 50 Hz – 20 kHz
Dimensions (w × h × d) .....
..... 165 × 554× 282.7 (mm)
Weight 13.5kg/each

Specifications and external appearance are subject to change without notice.

MEASUREMENT SETUP

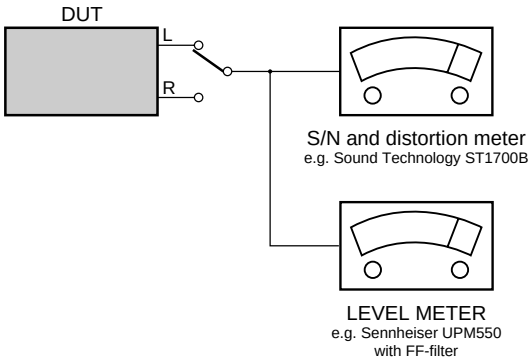
Tuner FM



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

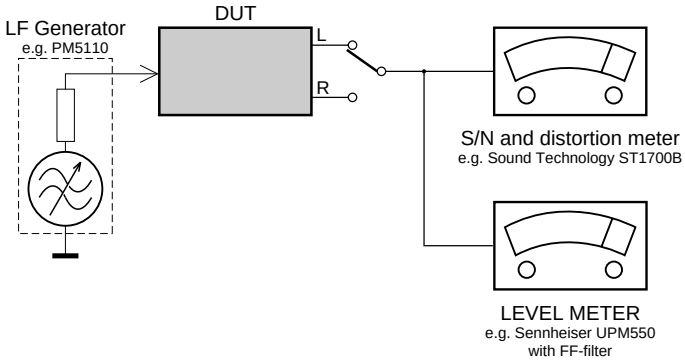
CD

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

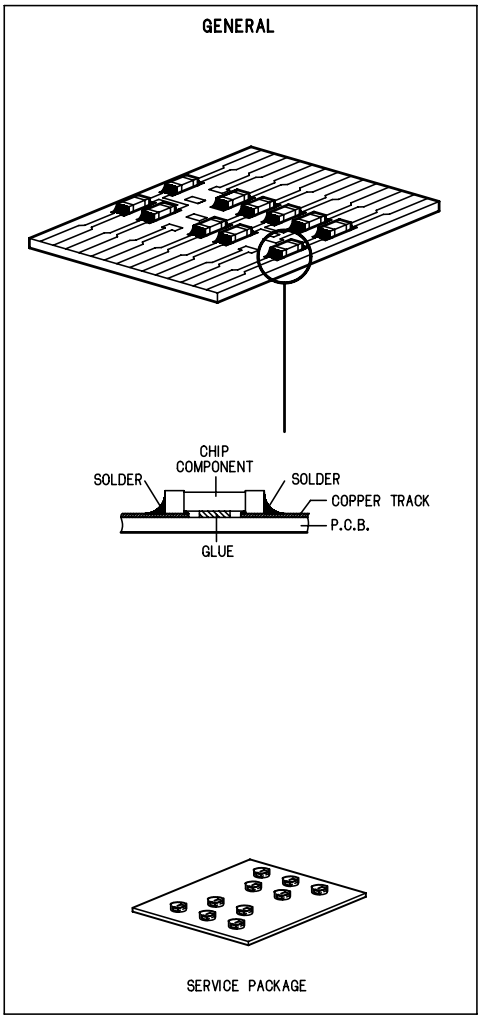
Compact Disc:

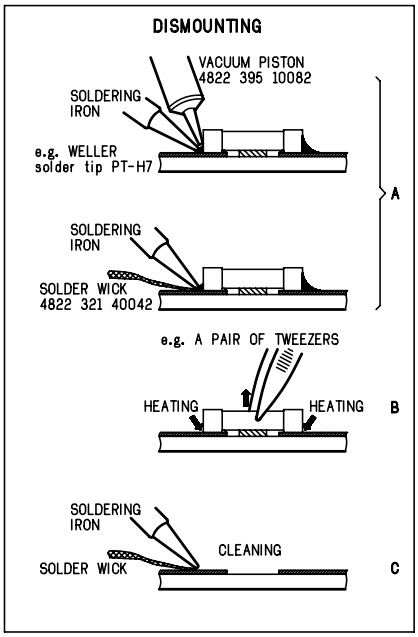
SBC426/426A Test disc 5 + 5A 4822 397 30096
SBC442 Audio Burn-in test disc 1kHz 4822 397 30155
SBC429 Audio Signals disc 4822 397 30184
Dolby Pro-logic Test Disc 4822 395 10216

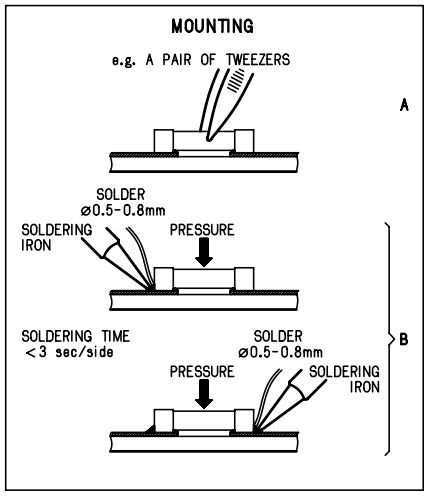
ESD Equipment:

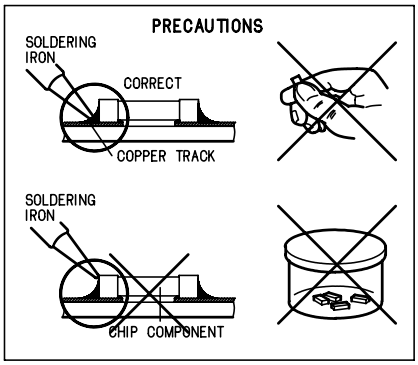
Anti-static table mat - large 1200x650x1.25mm ...4822 466 10953
anti-static table mat - small 600x650x1.25mm 4822 466 10958
Anti-static wristband 4822 395 10223
Connectorbox (1MΩ) 4822 395 11307
Extension cable
(to connect wristband to conn.box) 4822 320 11305
Connecting cable
(to connect table mat to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

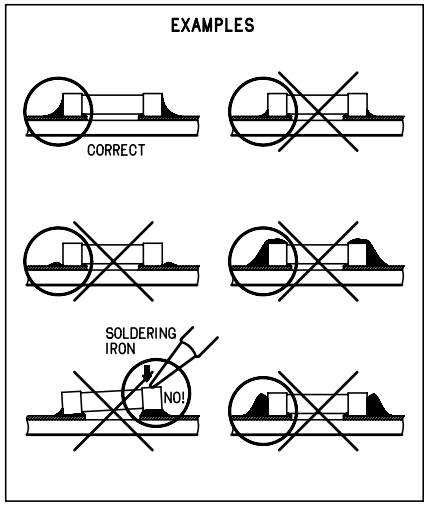
HANDLING CHIP COMPONENTS











ESD

(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).
Unsorgfältige Behandlung im Reparaturfall kan 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, extention 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 symbool ⚠

(F)

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

Less composants de sécurité sont marqués ⚠

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Original zustand 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.

Componenty 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.

CLASS 1
LASER PRODUCT

(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 udsaettelse for stråling.

(F)

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

INFORMATION ABOUT LEAD-FREE SOLDERING

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

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

Example S/N:

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

So from 0501 onwards = from 1 Jan 2005 onwards

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

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

- Use only lead-free solder alloy Philips SAC305 with order code 0622 149 00106. If lead-free solder-paste is required, please contact the manufacturer of your solder-equipment. In general use of solder-paste within workshops should be avoided because paste is not easy to store and to handle.

- Use only adequate solder tools applicable for lead-free solder alloy. The solder tool must be able
  - To reach at least a solder-temperature of 400°C,
  - To stabilize the adjusted temperature at the solder-tip
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature around 360°C – 380°C is reached and stabilized at the solder joint. Heating-time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C otherwise wear-out of tips will rise drastically and flux-fluid will be destroyed. To avoid wear-out of tips switch off un-used equipment, or reduce heat.
- Mix of lead-free solder alloy / parts with leaded solder alloy / parts is possible but PHILIPS recommends strongly to avoid mixed solder alloy types (leaded and lead-free).
  If one cannot avoid or does not know whether product is lead-free, clean carefully the solder-joint from old solder alloy and re-solder with new solder alloy (SAC305).
- Use only original spare-parts listed in the Service-Manuals. Not listed standard-material (commodities) has to be purchased at external companies.
- Special information for BGA-ICs:
  - always use the 12nc-recognizable soldering temperature profile of the specific BGA (for de-soldering always use the lead-free temperature profile, in case of doubt)
  - lead free BGA-ICs will be delivered in so-called 'dry-packaging' (sealed pack including a silica gel pack) to protect the IC against moisture. After opening, dependent of MSL-level seen on indicator-label in the bag, the BGA-IC possibly still has to be baked dry. (MSL=Moisture Sensitivity Level). This will be communicated via AYS-website.
  Do not re-use BGAs at all.

- For sets produced before 1.1.2005 (except products of 2004), containing leaded solder-alloy and components, all needed spare-parts will be available till the end of the service-period. For repair of such sets nothing changes.

- On our website **www.atyourservice.ce.Philips.com** you find more information to:

  - BGA-de-/soldering (+ baking instructions)
  - Heating-profiles of BGAs and other ICs used in Philips-sets

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

For additional questions please contact your local repair-helpdesk.

SERVICE INSTRUCTION

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

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the AC Power lead for external damage.
- Check the strain relief of the AC Power cord for proper function.
- Check the electrical DC resistance between the AC Power Plug and the secondary side (only for sets which have a AC Power isolated power supply):

1. Unplug the AC Power cord and connect a wire between the two pins of the AC Power plug.
2. Set the AC Power switch to the "on" position (keep the AC Power cord unplugged!).
3. Measure the resistance value between the pins of the AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be larger than 4.5 Mohm (For U.S. it should be between 4.2 Mohm and 12 Mohm).
4. Switch "off" the set, and remove the wire between the two pins of the AC Power plug.

- Check the cabinet for defects, to avoid touching of any inner parts by the customer.

2 - 1

REPAIR INSTRUCTION

MAIN UNIT REPAIR CHART 1/3

A ALL FUNCTION NO WORKING
B VFD DISPLAY NO SHOW AND KEY FUNCTION
C POWERSUPPLY NO WORKING
D AUDIO LINE NO OUTPUT
E DIGITAL LINE NO OUTPUT
F DVD NO VIDEO
G USB FUNCTION NO WORKING
H MIC FUNCTION NO WORKING
I TUNER FUNCTION NO WORKING
J AUX IN NO SOUND
K TAPE FUNCTION NO WORKING

A

All function No working

Checkall system all cable is loose or bad INT — YES → RE-insert and fix the cable

NO

Panel stanbyLED showworking or Not — NO → Checkback power PCB F901 bad cause damage — BAD → ChangeF901

YES → CheckCN953 5V if right — NO → Check+5V power supply circuit

YES → Checkrepair control PCB Standby circuit

WORK

CheckRB102 Pin5=5V — NO → Checkrepair switch power circuit (about B)

CHECK ← VCC=5V VCC33=33V VDD=1.5V

CORRECT

Checkall Voltage 3.3V and 1.5V give circuit — YES → CheckIC106 Pin203 Pin186(osc frequency 27MHz)

YES → Repairmain pcb between U107 toIC106 circuit

B

VFD display No show and key function

Checkcontrol pcb RB300RB301cable loose or bad INT — YES → RE-insert and fix the cable

NO

ChecktestRB300 Pin4=-24V Pin5=5V Pin9,8=AC3.5V — NO → Checkback power PCB power supply circuit

NO

Checktest RB301 Pin3/CLK, Pin4/DATA and pin2/CE — NO → CheckIC106 AND IC300

YES

CheckVFD control PCB section bad cause damage

C

Power supply No working

All voltage No output — NO →
- +12V No output → CheckD959 and its conjoint part
- +5V No output → CheckD960 and its conjoint part
- -27V No output → CheckD963 and its conjoint part

YES

CheckF901 bad CauseDamage

YES

ChangeF901

2 - 1

REPAIR INSTRUCTION

MAIN UNIT REPAIR CHART 1/3

A ALL FUNCTION NO WORKING
B VFD DISPLAY NO SHOW AND KEY FUNCTION
C POWERSUPPLY NO WORKING
D AUDIO LINE NO OUTPUT
E DIGITAL LINE NO OUTPUT
F DVD NO VIDEO
G USB FUNCTION NO WORKING
H MIC FUNCTION NO WORKING
I TUNER FUNCTION NO WORKING
J AUX IN NO SOUND
K TAPE FUNCTION NO WORKING

A

All function No working

Checkall system all cable is loose or bad INT — YES → RE-insert and fix the cable

NO

Panel stanbyLED showworking or Not — NO → Checkback power PCB F901 bad cause damage — BAD → ChangeF901

YES → CheckCN953 5V if right — NO → Check+5V power supply circuit

YES → Checkrepair control PCB Standby circuit

WORK

CheckRB102 Pin5=5V — NO → Checkrepair switch power circuit (about B)

CHECK ← VCC=5V VCC33=33V VDD=1.5V

CORRECT

Checkall Voltage 3.3V and 1.5V give circuit — YES → CheckIC106 Pin203 Pin186(osc frequency 27MHz)

YES → Repairmain pcb between U107 toIC106 circuit

B

VFD display No show and key function

Checkcontrol pcb RB300RB301cable loose or bad INT — YES → RE-insert and fix the cable

NO

ChecktestRB300 Pin4=-24V Pin5=5V Pin9,8=AC3.5V — NO → Checkback power PCB power supply circuit

NO

Checktest RB301 Pin3/CLK, Pin4/DATA and pin2/CE — NO → CheckIC106 AND IC300

YES

CheckVFD control PCB section bad cause damage

C

Power supply No working

All voltage No output — NO →
- +12V No output → CheckD959 and its conjoint part
- +5V No output → CheckD960 and its conjoint part
- -27V No output → CheckD963 and its conjoint part

YES

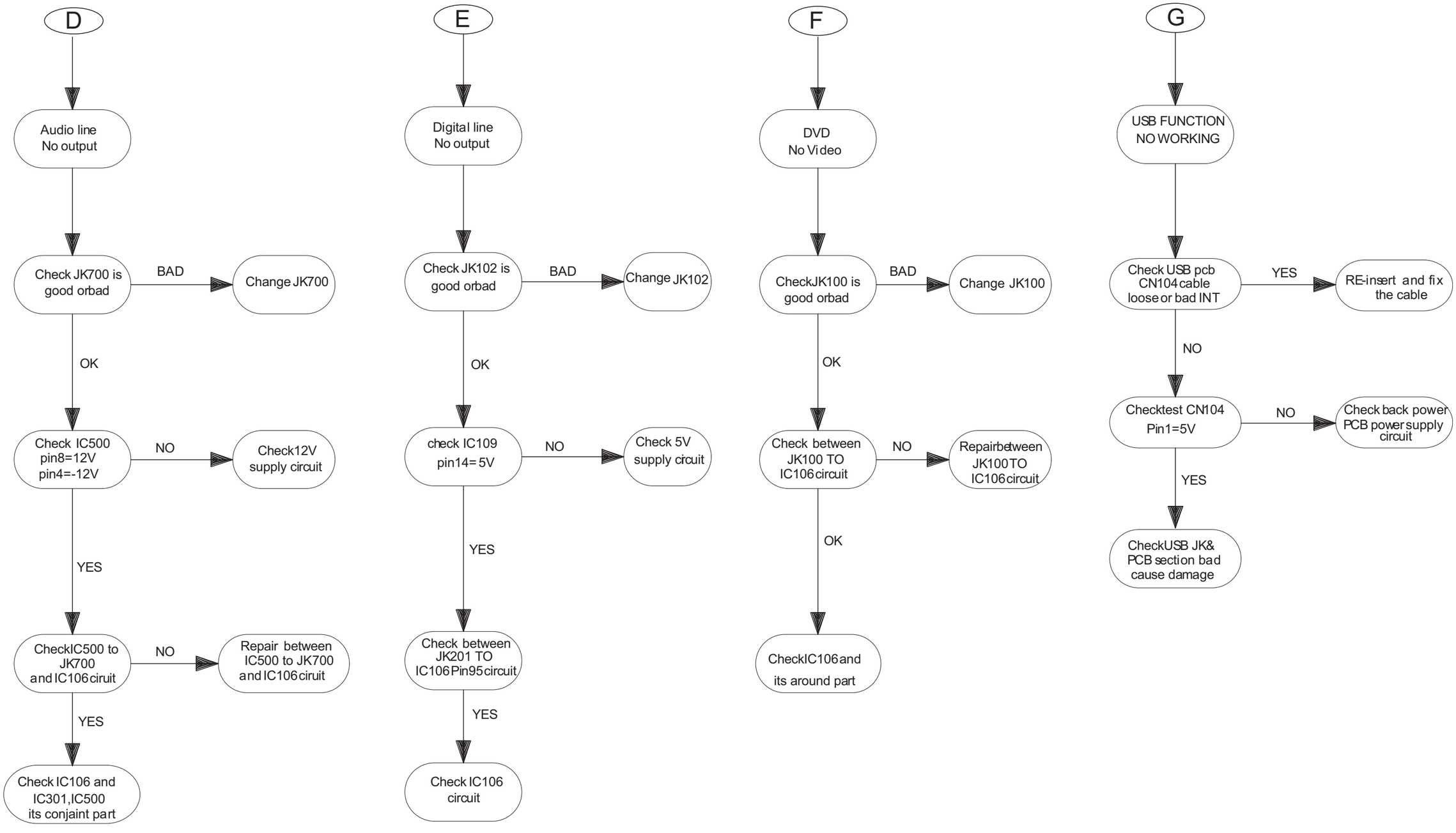
CheckF901 bad CauseDamage

YES

ChangeF901

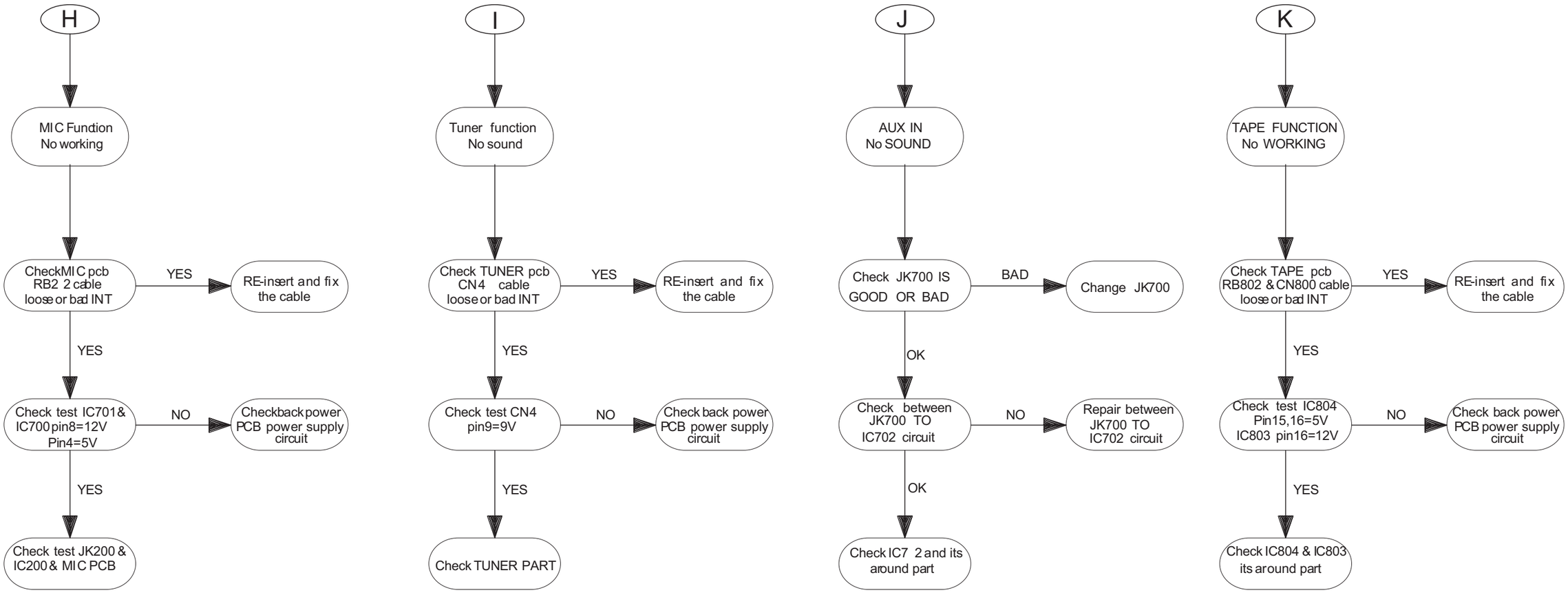
2 - 2

MAIN UNIT REPAIR CHART 2/3



2 - 3

MAIN UNIT REPAIR CHART 3/3



DISASSEMBLY INSTRUCTIONS

Dismantling of the back panel & DVD Module

1) Loosen 6 screws at both slide cover "A" shown as figure 1 and 8 screws at back panel to take out the top cover.
2) Loosen 18 screws "B " at the back panel as figure 2.
3) Loosen 4 screws "C " to take out DVD module cover as figure 3.
4) Loosen 4 screws "D " to take out DVD module as figure 4.

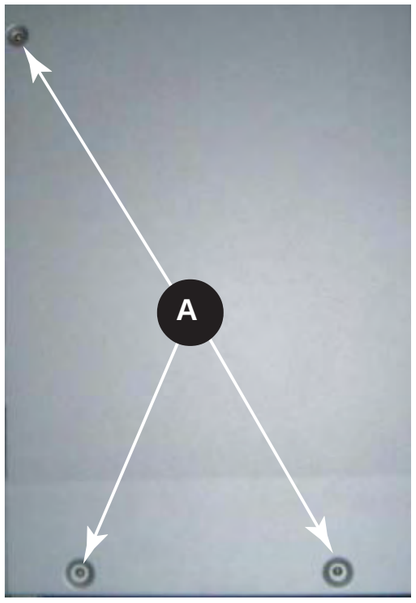


Figure 1

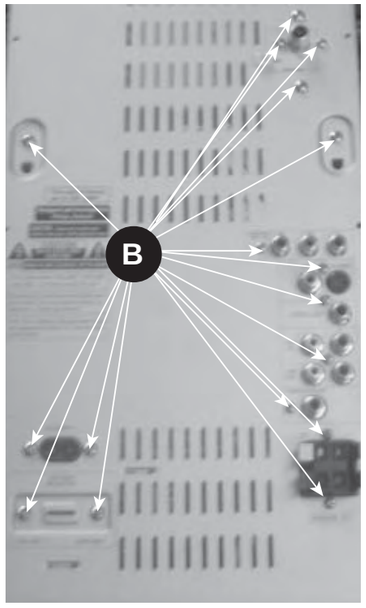


Figure 2

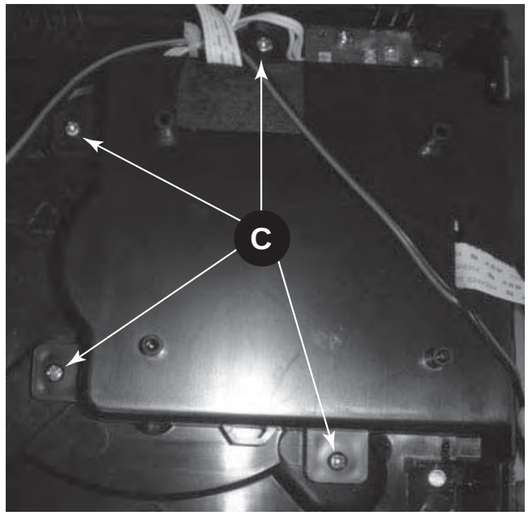


Figure 3

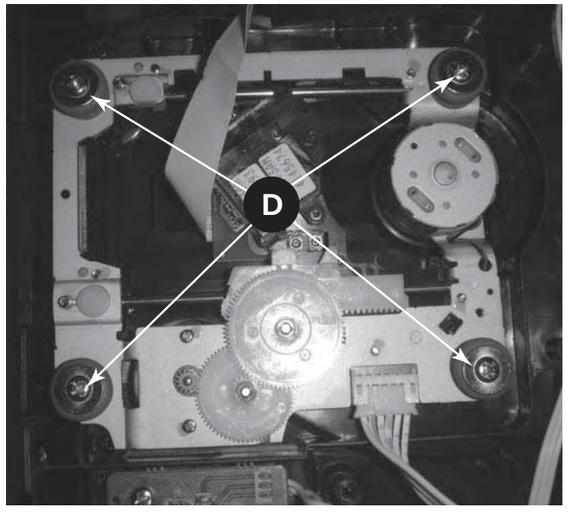


Figure 4

Dismantling of the Main Board

1) Release 1 screw " E " at the side of main board as figure 5.
2) Loosen 1 screw "F" at the main heat sink board as figure 6.

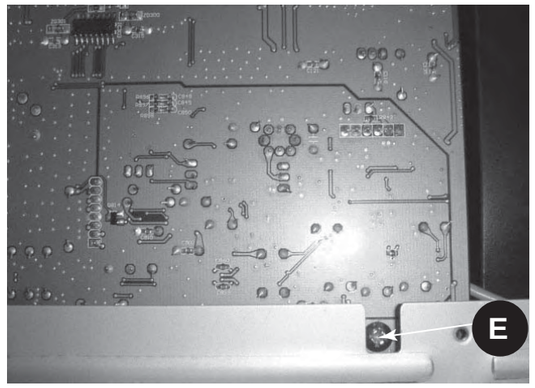


Figure 5

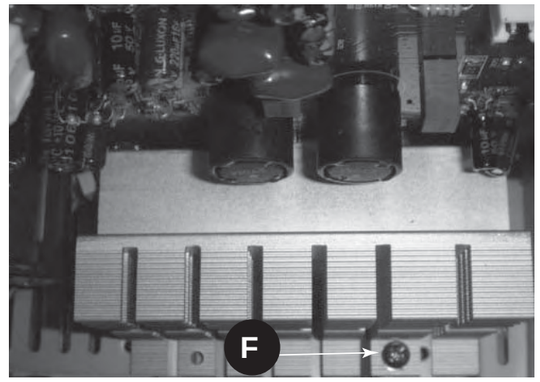


Figure 6

Dismantling of the Power Board

1) Loosen 4 screws " G " to remove the Power Board as figure 7.
2) Remove the catch "H" using cutter as shown in figure 8.

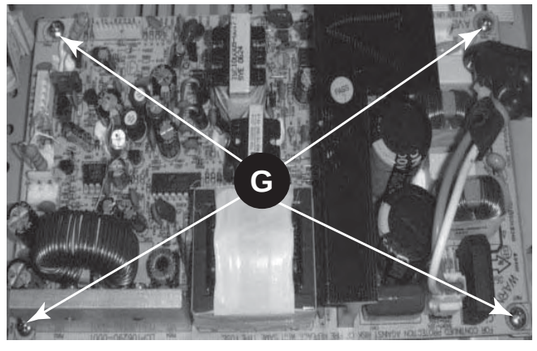


Figure 7

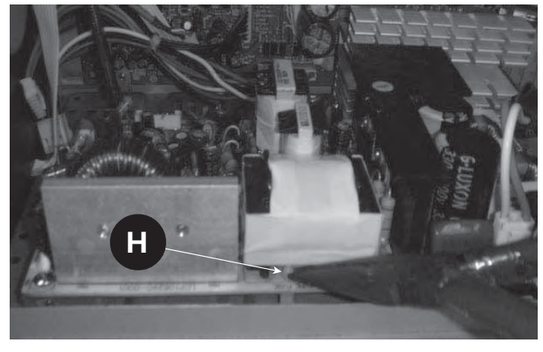


Figure 8

Dismantling of Control Board and Cassette module

1) Loosen 15 screws " I " on the control board as shown in figure 9.
2) Using long noise plier to knock the pin shown in figure 10 in order to let the volume button will drop out at front panel.
3) At front panel, using the long noise plier to take out the volume nut by turning anti-clock wise as shown in figure 11. Press the volume adjustable at front panel, then the control board can be take out.
4) Loosen 4 screws "J" to remove the Cassette Module shown as figure 12.

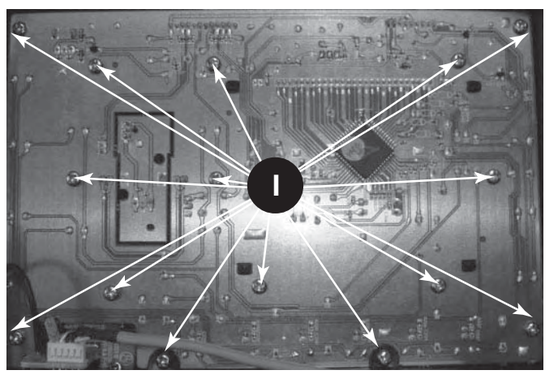


Figure 9

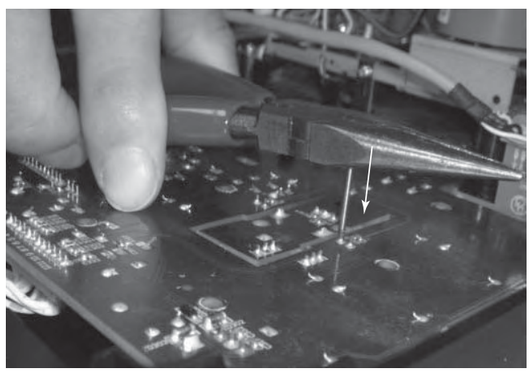


Figure 10

Figure 11

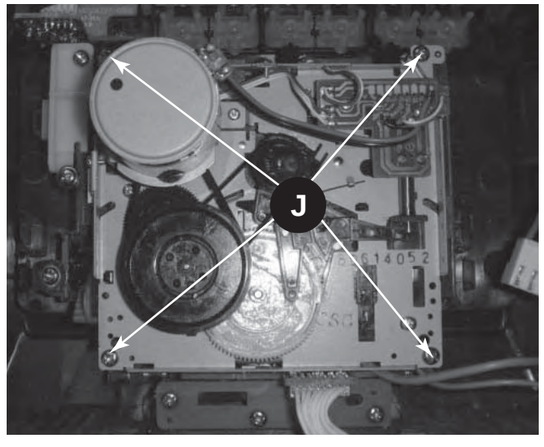
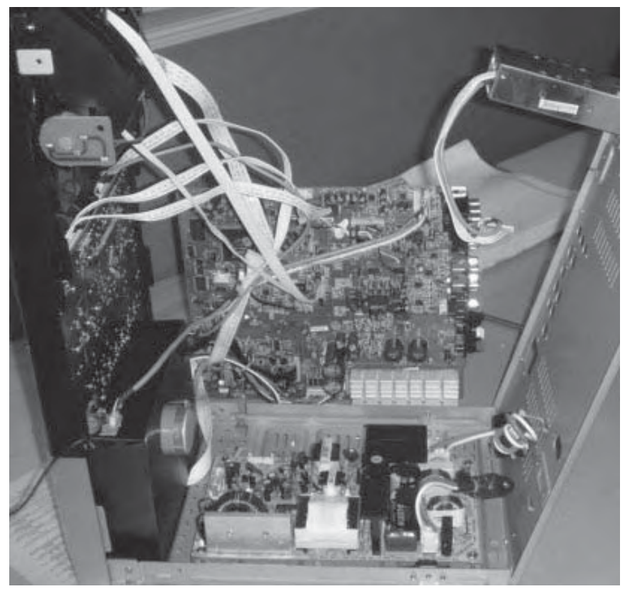


Figure 12

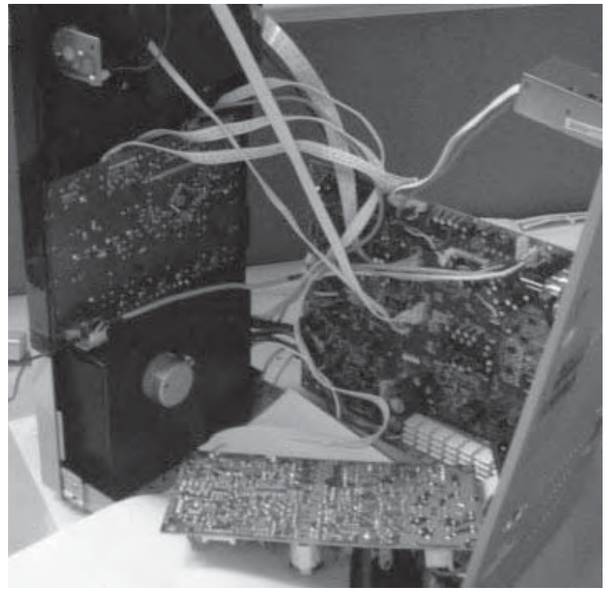
SERVICE POSITIONS

Service position A



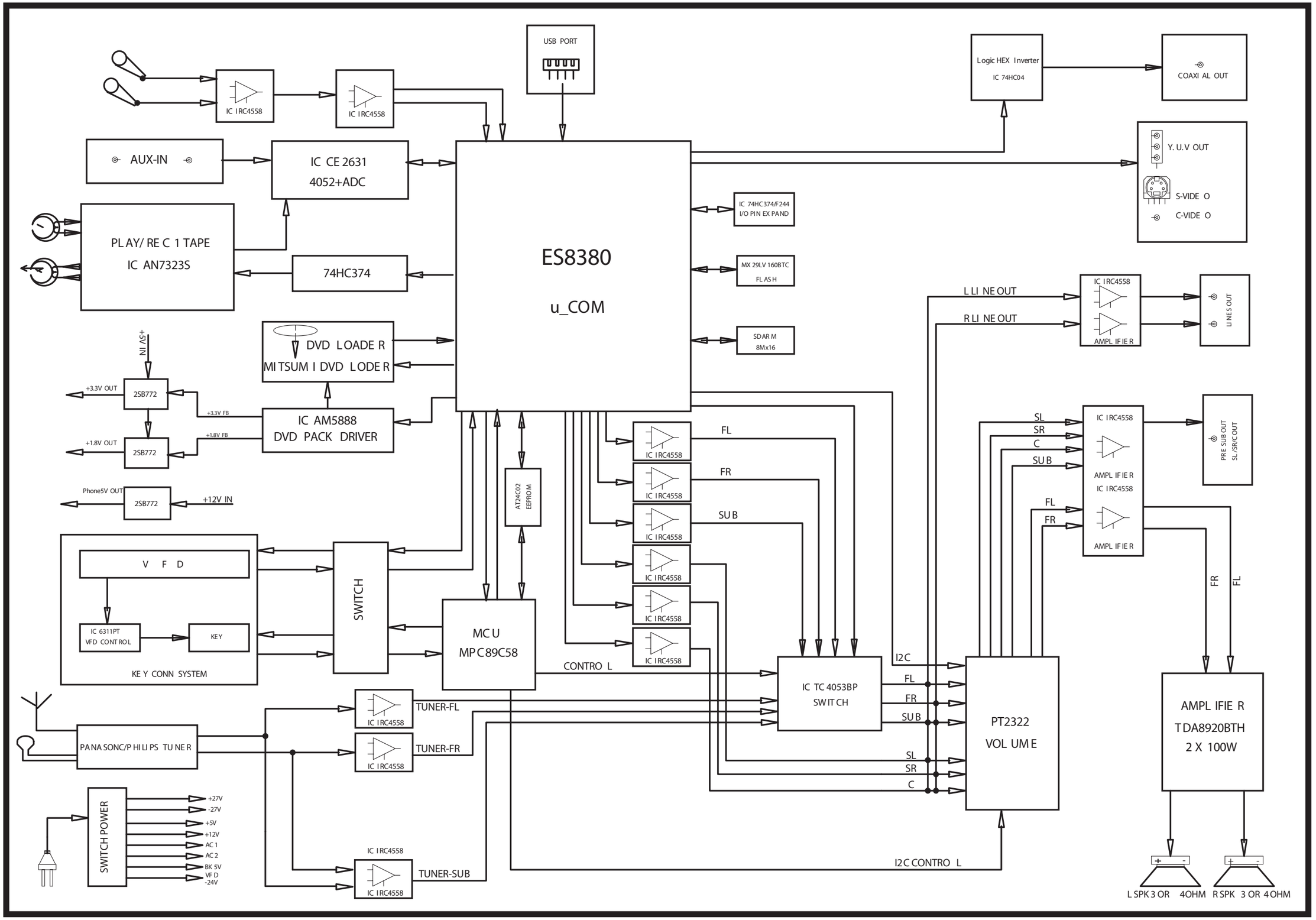
Note: In some service positions the components or copper patterns of one board may risk touching its neighbouring pc boards or metallic parts. To prevent such short-circuit use a piece of hard paper or other insulating material between them.

Service position B



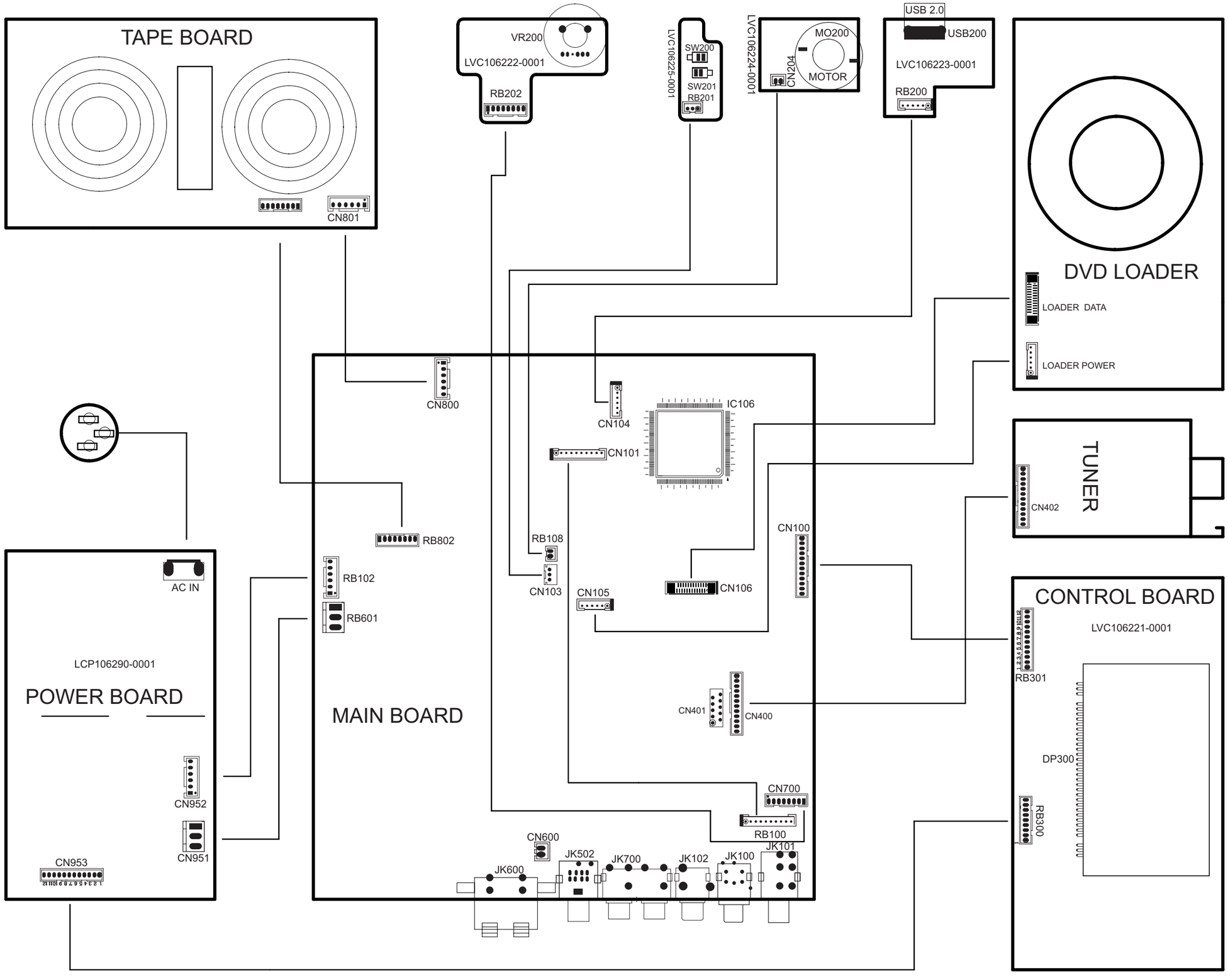
4 - 1

BLOCK DIAGRAM



4 - 2

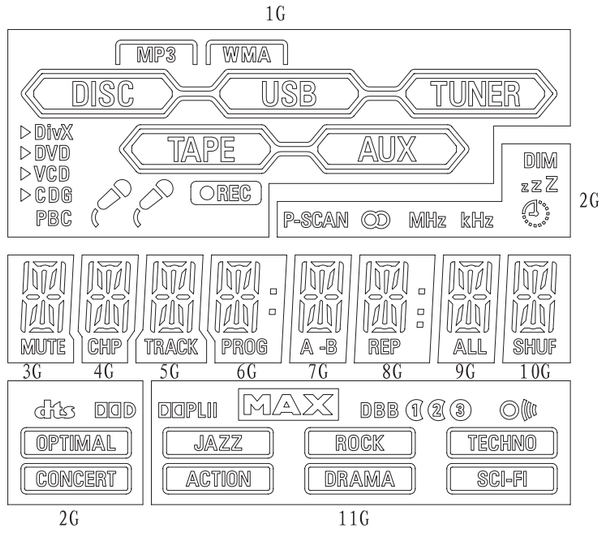
WIRING DIAGRAM

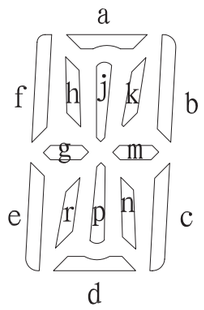


CONTROL BOARD

TABLE OF CONTENTS

FTD DISPLAY PIN ASSIGNMENT





3G--10G

	1G	2G	3G	4G	5G	6G	7G	8G	9G	10G	11G
P1	WMA		MUTE	CHP	TRACK	PROG	A	REP	ALL	SHUF	
P2	MP3						-B	Dp			
P3	DISC		d	d	d	d	d	d	d	d	DOLBY PLII
P4	TAPE		e	e	e	e	e	e	e	e	MAX
P5	AUX		r	r	r	r	r	r	r	r	DBB
P6	USB	dts	n	n	n	n	n	n	n	n	①
P7	TUNER	DOLBY DIGITAL	c	c	c	c	c	c	c	c	②
P8		OPTIMAL	m	m	m	m	m	m	m	m	③
P9	REC	CONCERT	g	g	g	g	g	g	g	g	
P10	DivX	DIM	f	f	f	f	f	f	f	f	JAZZ
P11	DVD	zzZ	b	b	b	b	b	b	b	b	ROCK
P12	VCD		k	k	k	k	k	k	k	k	TECHNO
P13	CDG	MHz	j, p	j, p	j, p	j, p	j, p	j, p	j, p	j, p	ACTION
P14	PBC	kHz	h	h	h	h	h	h	h	h	DRAMA
P15	s1		a	a	a	a	a	a	a	a	SCI-FI
P16	s2	P-SCAN				col		col			

PIN CONNECTION

Pin NO.	1	2	3	4	5	6	7	8	9	10	11	12
Connection	F1	F1	F1	NP	P1	P2	P3	P4	P5	P6	P7	P8
Pin NO.	13	14	15	16	17	18	19	20	21	22	23	24
Connection	P9	P10	P11	P12	P13	P14	P15	P16	1G	2G	3G	4G
Pin NO.	25	26	27	28	29	30	31	32	33	34	35	
Connection	5G	6G	7G	8G	9G	10G	11G	NP	F2	F2	F2	

Notes: Fn: Filament Pin
Pn: Anode Pin
nG: Grid Pin
NP: No Pin

5-2

Voltage

IC300(PT6311)																
Pin NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Voltage	0.00	0.00	0.00	0.00	4.90	4.80	0.00	3.40	3.30	0.00	0.00	0.00	0.00	5.00	-22.30	-27.00	-18.20
Pin NO	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
Voltage	-17.60	-19.10	-20.30	0.00	18.00	-24.70	-24.80	-24.90	-18.20	-24.90	-25.30	-26.20	5.10	-27.50	-25.80	-25.30	-25.30
Pin NO	41	42	43	44	45	46	47	48	49	50	51	52					
Voltage	-25.30	-25.30	-25.40	-26.10	5.00	5.00	5.00	5.00	5.00	5.00	0.00	2.80					

Q200			
Pin NO	b	c	e
Voltage	0.00	2.60	0.00

Q300			
Pin NO	b	c	e
Voltage	4.50	0.00	4.50

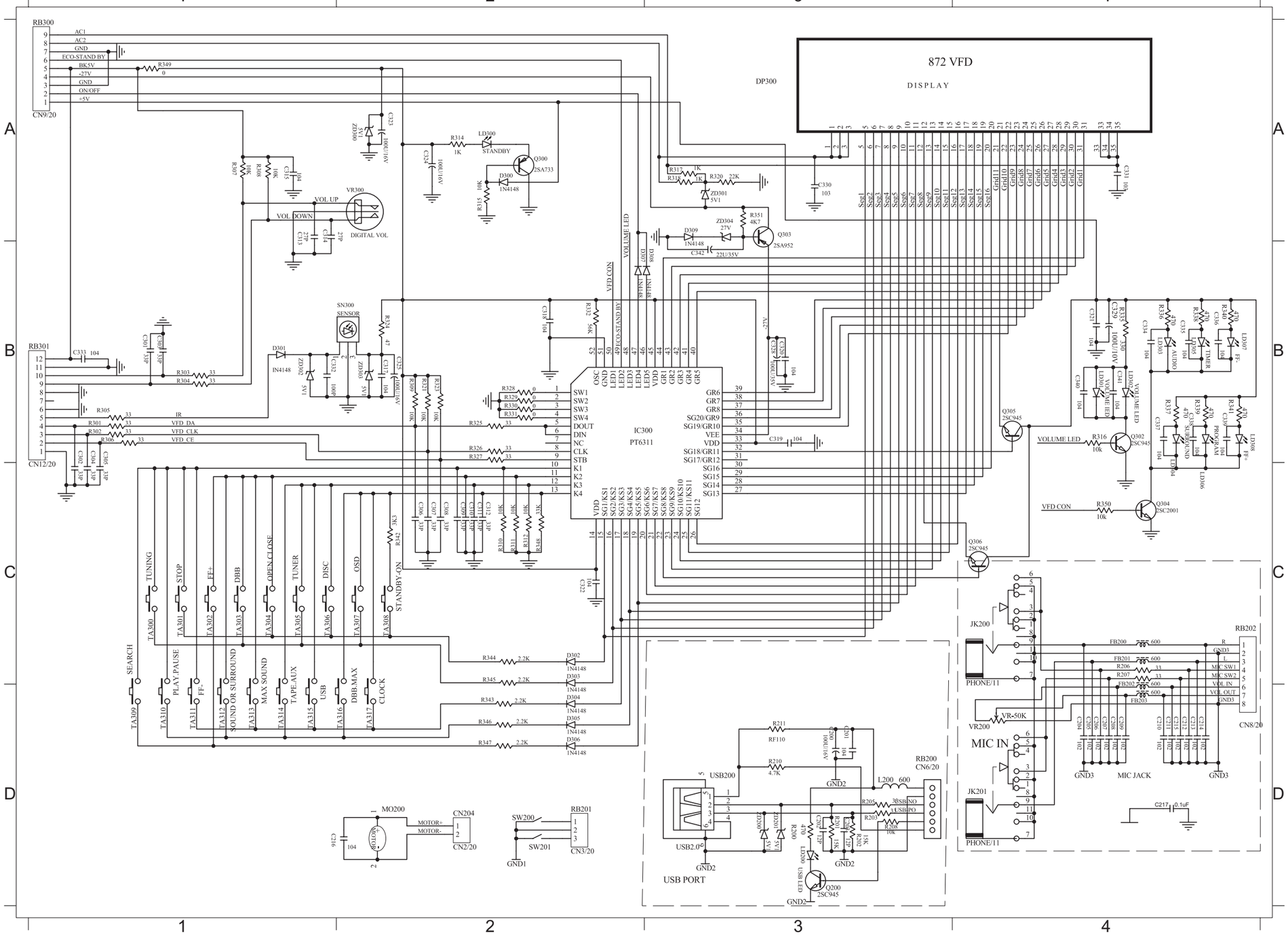
Q302			
Pin NO	b	c	e
Voltage	0.00	3.00	0.00

Q303		
Pin NO	b	c
Voltage	-28.00	-31.90

5-3

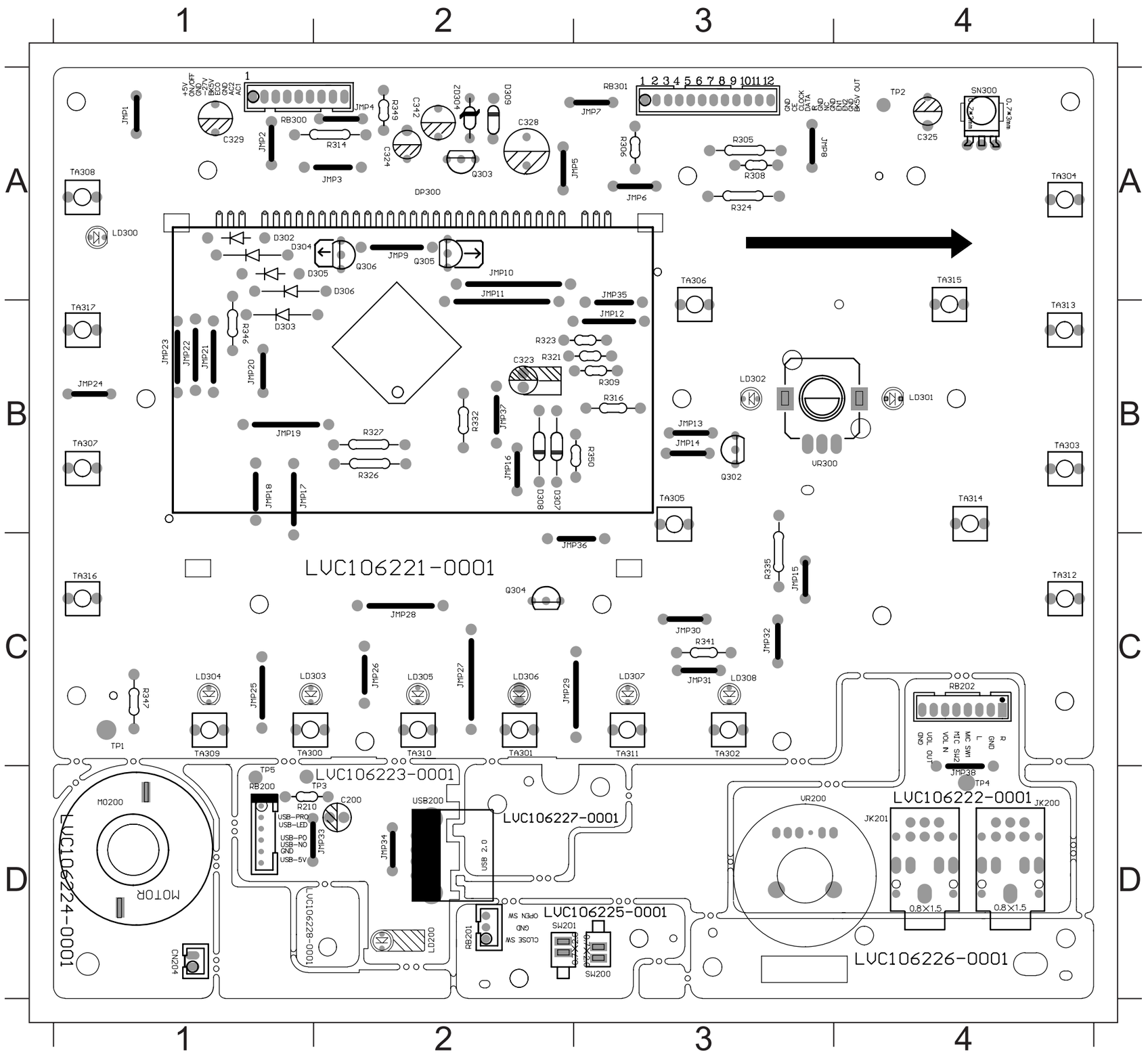
CIRCUIT DIAGRAM - CONTROL BOARD

C200	D3	C208	D4	C216	D1	C307	C2	C315	A1	C324	A2	C334	B4	C342	B3	D306	D2	FB203	D4	LD302	B4	Q200	D3	R201	D3	R211	D3	R308	A1	R321	B2	R330	B2	R340	B4	R348	C2	RB301	B1	TA304	C1	TA312	C1	VR300	A2
C201	D3	C209	D4	C217	D4	C308	C2	C317	B2	C325	B2	C335	B4	CN204	D2	D307	B2	IC300	B3	LD303	B4	Q300	A2	R202	D3	R301	B1	R309	B2	R323	B2	R331	B2	R341	B4	R349	A1	SN300	B2	TA305	C1	TA313	C1	ZD200	D3
C202	D3	C210	D4	C301	B1	C309	C2	C318	B2	C328	B3	C336	B4	D300	A2	D308	B3	JK200	C4	LD304	B4	Q302	B4	R203	D3	R302	B1	R310	C2	R324	B2	R332	B2	R342	C2	R350	C4	SW200	D2	TA306	C1	TA314	C1	ZD201	D3
C203	D3	C211	D4	C302	B1	C310	C2	C319	B3	C329	B4	C337	B4	D301	B1	D309	A3	JK201	D4	LD305	B4	Q303	A3	R205	D3	R303	B1	R311	C2	R325	B2	R335	B4	R343	D2	R351	A3	SW201	D2	TA307	C2	TA315	C1	ZD300	A2
C204	D4	C212	D4	C303	B1	C311	C2	C320	B3	C330	A3	C338	B4	D302	C2	DP300	A3	L200	D3	LD306	B4	Q304	C4	R206	C4	R304	B1	R312	C2	R326	B2	R336	B4	R344	C2	RB200	D3	TA300	C1	TA308	C2	TA316	C2	ZD302	B1
C205	D4	C213	D4	C304	B1	C312	C2	C321	B4	C331	A4	C339	B4	D303	C2	FB200	C4	LD200	D3	LD307	B4	Q305	B4	R207	C4	R305	B1	R314	A2	R327	B2	R337	B4	R345	C2	RB201	D2	TA301	C1	TA309	C1	TA317	C2	ZD303	B2
C206	D4	C214	D4	C305	B1	C313	A1	C322	C2	C332	B1	C340	B4	D304	D2	FB201	C4	LD300	A2	LD308	B4	Q306	C4	R208	D3	R306	B1	R315	A2	R328	B2	R338	B4	R346	D2	RB202	C4	TA302	C1	TA310	C1	USB200	D3	ZD304	A3
C207	D4	C215	D4	C306	C2	C314	A1	C323	A2	C333	B1	C341	B4	D305	D2	FB202	C4	LD301	B4	MO200	D1	R200	D3	R210	D3	R307	A1	R316	B4	R329	B2	R339	B4	R347	D2	RB300	A1	TA303	C1	TA311	C1	VR200	D4		



5-4

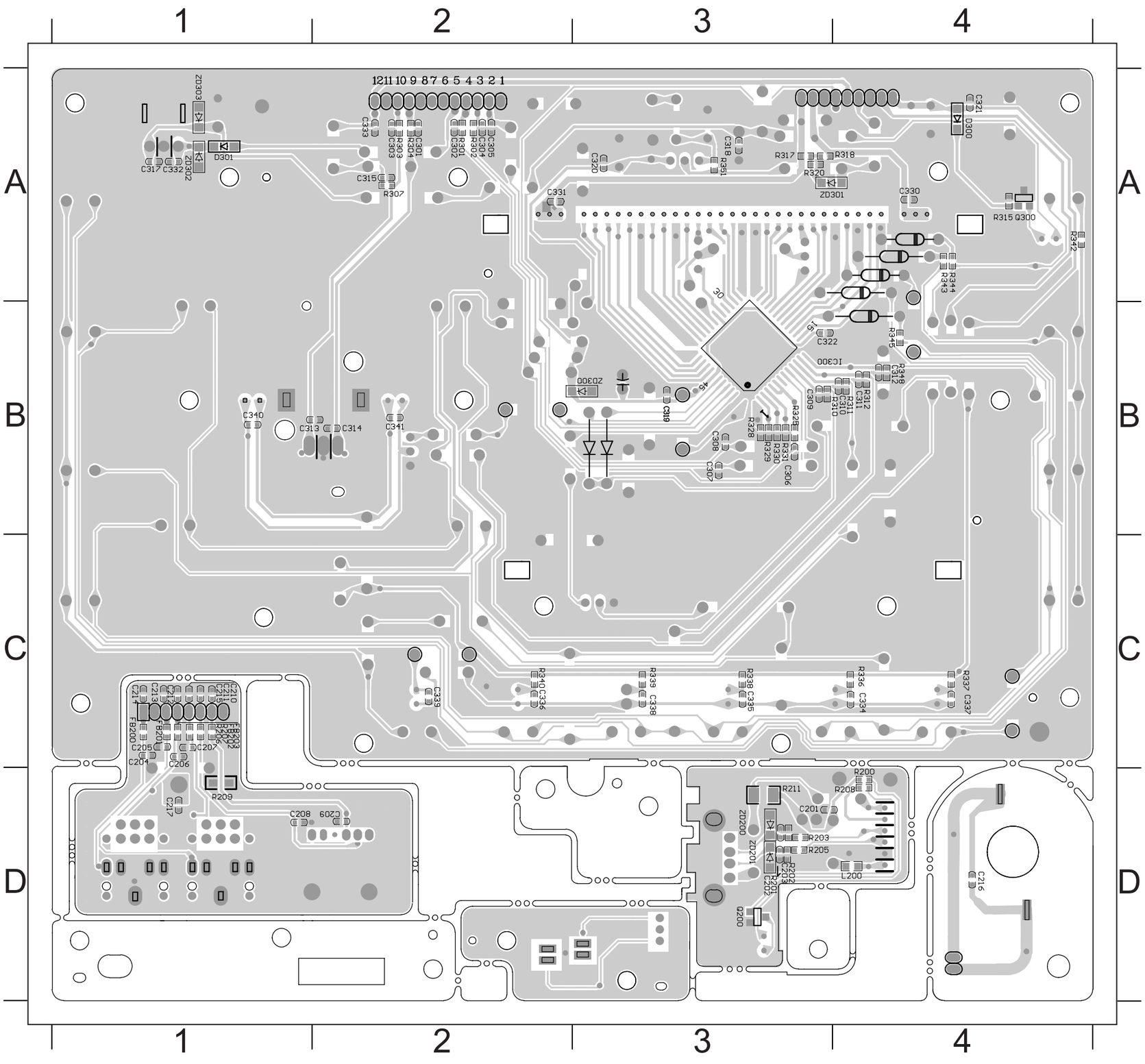
PCB LAYOUT - TOP VIEW



C200	D2	JMP35	A3	RB300	A1
C323	B2	JMP36	C2	RB301	A3
C324	A2	JMP37	B2	SN300	A4
C325	A4	JMP4	A2	SW200	D3
C328	A2	JMP5	A2	SW201	D2
C329	A1	JMP6	A3	TA300	C1
C342	A2	JMP7	A3	TA301	C2
CN204	D1	JMP8	A3	TA302	C3
D302	A1	JMP9	A2	TA303	B4
D303	B1	LD200	D2	TA304	A4
D304	A1	LD300	A1	TA305	B3
D305	A1	LD301	A4	TA306	A3
D306	A1	LD302	B3	TA307	B1
D307	B2	LD303	C1	TA308	A1
D308	B2	LD304	C1	TA309	C1
D309	A2	LD305	C2	TA310	C2
DP300	A2	LD306	C2	TA311	C3
JK200	D4	LD307	C3	TA312	C4
JK201	D4	LD308	C3	TA313	B4
JMP1	A1	MO200	D1	TA314	B4
JMP10	A2	Q302	B3	TA315	A4
JMP11	A2	Q303	A2	TA316	C1
JMP12	B3	Q304	C2	TA317	B1
JMP13	B3	Q305	A2	TP1	C1
JMP14	B3	Q306	A2	TP3	D1
JMP15	C3	R210	D2	TP4	C4
JMP16	B2	R305	A3	TP5	D1
JMP17	B1	R306	A3	USB200	D2
JMP18	B1	R308	A3	VR200	D3
JMP19	B1	R309	B3	VR300	B3
JMP2	A1	R314	A2	ZD304	A2
JMP20	B1	R316	B3		
JMP21	B1	R321	B3		
JMP22	B1	R323	B3		
JMP23	B1	R324	A3		
JMP24	B1	R326	B2		
JMP25	C1	R327	B2		
JMP26	C2	R332	B2		
JMP27	C2	R335	C3		
JMP28	C2	R341	C3		
JMP29	C2	R346	B1		
JMP3	A1	R347	C1		
JMP30	C3	R349	A2		
JMP31	C3	R350	B3		
JMP32	C3	RB200	D1		
JMP33	D2	RB201	D2		
JMP34	D2	RB202	C4		

5-5

PCB LAYOUT - BOTTOM VIEW



C201	D4	C339	C2	R351	A3
C202	D3	C340	B1	ZD200	D3
C203	D3	C341	B2	ZD201	D3
C204	C1	D300	A4	ZD300	B3
C205	C1	D301	A1	ZD302	A1
C206	C1	FB200	C1	ZD303	A1
C207	C1	FB201	C1		
C208	D1	FB202	C1		
C209	D1	FB203	C1		
C210	C1	IC300	B4		
C211	C1	L200	D4		
C212	C1	Q200	D3		
C213	C1	Q300	A4		
C214	C1	R200	D4		
C215	C1	R201	D3		
C216	D4	R202	D3		
C217	D1	R203	D3		
C301	A2	R205	D3		
C302	A2	R206	C1		
C303	A2	R207	C1		
C304	A2	R208	D4		
C305	A2	R209	D1		
C306	B3	R211	D3		
C307	B3	R301	A2		
C308	B3	R302	A2		
C309	B3	R303	A2		
C310	B4	R304	A2		
C311	B4	R307	A2		
C312	B4	R310	B4		
C313	B2	R311	B4		
C314	B2	R312	B4		
C315	A2	R315	A4		
C317	A1	R325	B3		
C318	A3	R328	B3		
C319	B3	R329	B3		
C320	A3	R330	B3		
C321	A4	R331	B3		
C322	B3	R336	C4		
C330	A4	R337	C4		
C331	A2	R338	C3		
C332	A1	R339	C3		
C333	A2	R340	C2		
C334	C4	R342	A4		
C335	C3	R343	A4		
C336	C2	R344	A4		
C337	C4	R345	B4		
C338	C3	R348	B4		

5-6

ELECTRICAL PARTS LIST - CONTROL BOARD

DP300	9965 000 41957	VFD 33P
IC300	9940 000 01564	IC 52P PT6311
JK200	9965 000 22276	PHONE JACK D3.5 11P
JK201	9965 000 22276	PHONE JACK D3.5 11P
LD200	9965 000 41956	LED HI-BLUE
LD300	9940 000 05258	LED D3 RED ROUND
LD301	9965 000 41956	LED HI-BLUE
LD302	9965 000 41956	LED HI-BLUE
LD303	9965 000 41956	LED HI-BLUE
LD304	9965 000 41956	LED HI-BLUE
LD305	9965 000 41956	LED HI-BLUE
LD306	9965 000 41956	LED HI-BLUE
LD307	9965 000 41956	LED HI-BLUE
LD308	9965 000 41956	LED HI-BLUE
Q200	9940 000 00915	XISTR NPN 2SC1623
Q300	9940 000 00921	XISTR PNP 2SA812 HFE:200-400
Q302	4822 130 41198	2SC945P
Q303	9940 000 05347	XISTR PNP 2SA952-K
Q304	4822 130 41651	2SC2001L
Q305	4822 130 41198	2SC945P
Q306	4822 130 41198	2SC945P
R211	9965 000 41960	PTC THERMISTOR
SN300	9940 000 05472	IRT RECEIVER IRM-2638AF4
SW200	9965 000 19374	SW LEAF KFC-101
SW201	9965 000 19374	SW LEAF KFC-101
TA300	4822 276 13648	TACT SWITCH
TA301	4822 276 13648	TACT SWITCH
TA302	4822 276 13648	TACT SWITCH
TA303	4822 276 13648	TACT SWITCH
TA304	4822 276 13648	TACT SWITCH
TA305	4822 276 13648	TACT SWITCH
TA306	4822 276 13648	TACT SWITCH
TA307	4822 276 13648	TACT SWITCH
TA308	4822 276 13648	TACT SWITCH
TA309	4822 276 13648	TACT SWITCH
TA310	4822 276 13648	TACT SWITCH
TA311	4822 276 13648	TACT SWITCH
TA312	4822 276 13648	TACT SWITCH
TA313	4822 276 13648	TACT SWITCH
TA314	4822 276 13648	TACT SWITCH
TA315	4822 276 13648	TACT SWITCH
TA316	4822 276 13648	TACT SWITCH
TA317	4822 276 13648	TACT SWITCH
USB200	9965 000 41955	USB JACK 4P AC 750V 1A
VR200	9965 000 41959	CNTL ROTRY 50KR
VR300	9965 000 41958	ENCODER EC121102E2B

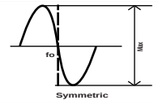
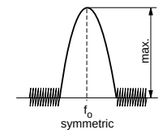
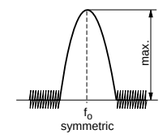
Note: **Only these parts mentioned in the list are normal service parts.**

TUNER BOARD

TABLE OF CONTENTS

This board will not be intended to repair on component level. The publication only for orientation. The module can be ordered with service code number: 9965 000 41917.

TUNER ADJUSTMENT TABLE

Waverange	Input frequency	Input	Tuned to	Adjust	Output	Scope/Voltmeter
VARICAP ALIGNMENT						
FM 87.5 - 108MHz (50kHz grid)			108MHz	check		6.5V ±1.2V
			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 ± 1HV
			530KHz	T005		1.1V ± 0.2V
FM - IF						
FM	10.7MHz, 50mV continuous wave		IC001 pin 23 short circuit to block AFC 200P	No need to adjust		
FM - RF						
FM	108MHz	mod=1kHz Δf=±22.5kHz	106MHz	VC001	MAX	MAX
	87.5MHz		90.1MHz	L001		
AM IF						
AM	450kHz Connect pin 29 of IC001 (AM Osc.) with short wire to ground (pin 6)	Δf = ±15kHz V_{RF} = 3mV	IC001 pin 24 100nF R220	T001 T002	MAX	
AM AFC **MW**		ΔV=mV		T003		
AM RF [3]						
MW	1404kHz	Δf = ±30kHz V_{RF} as low as possible	1404kHz	VC001	MAX	
	576kHz		612kHz	T006		
	1400kHz		1400kHz	VC002		
	610kHz		610kHz	T006		

Use Service Testprogram. By selecting the TUNER TEST test frequencies will be stored as preset frequencies automatically.

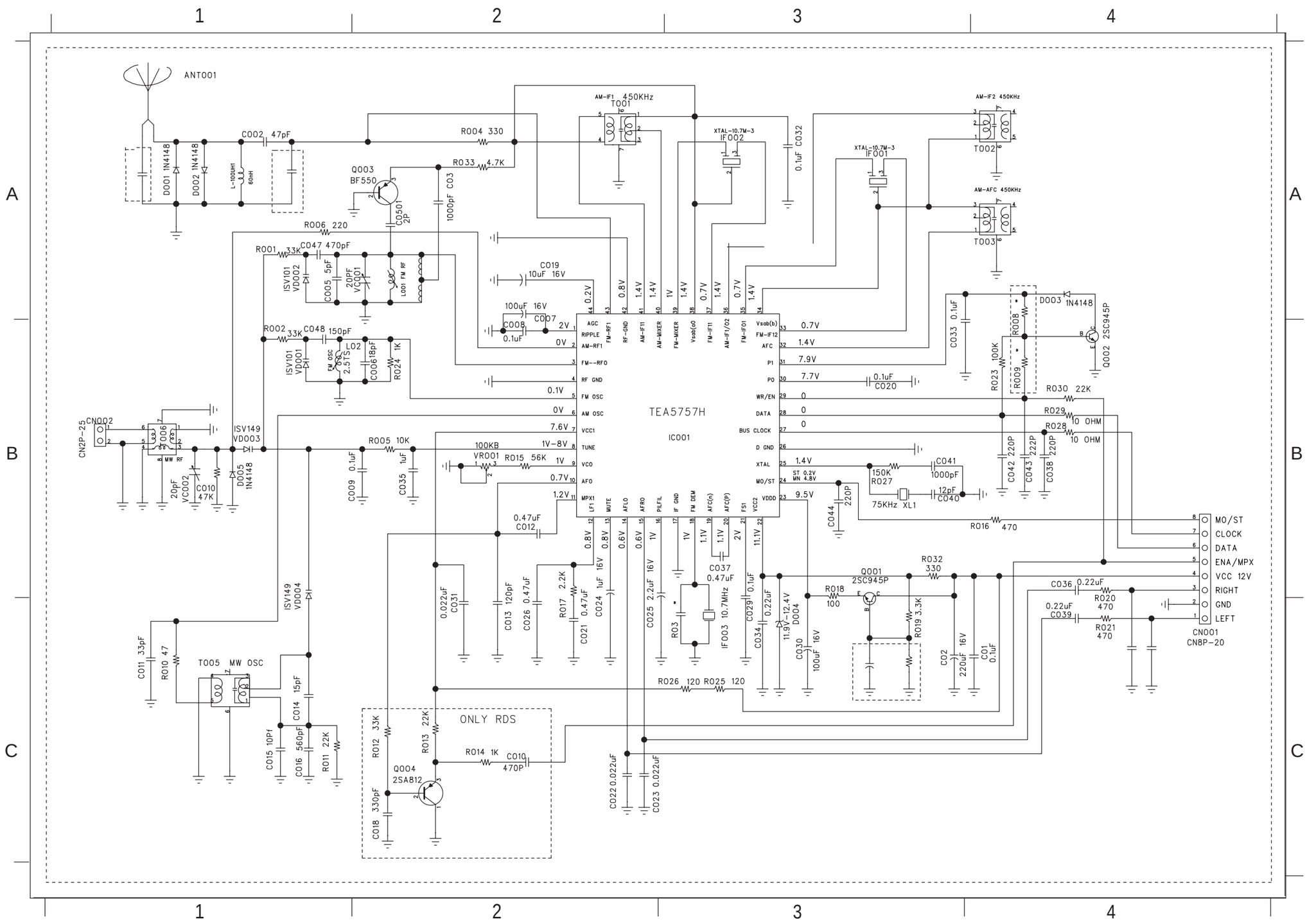
1) If sensitivity of frequency counter is too low adjust to max. channel separation (input signal: stereo left 90% + 9%, adjust output on right channel to minimum)

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!

6-2

CIRCUIT DIAGRAM - TUNER BOARD

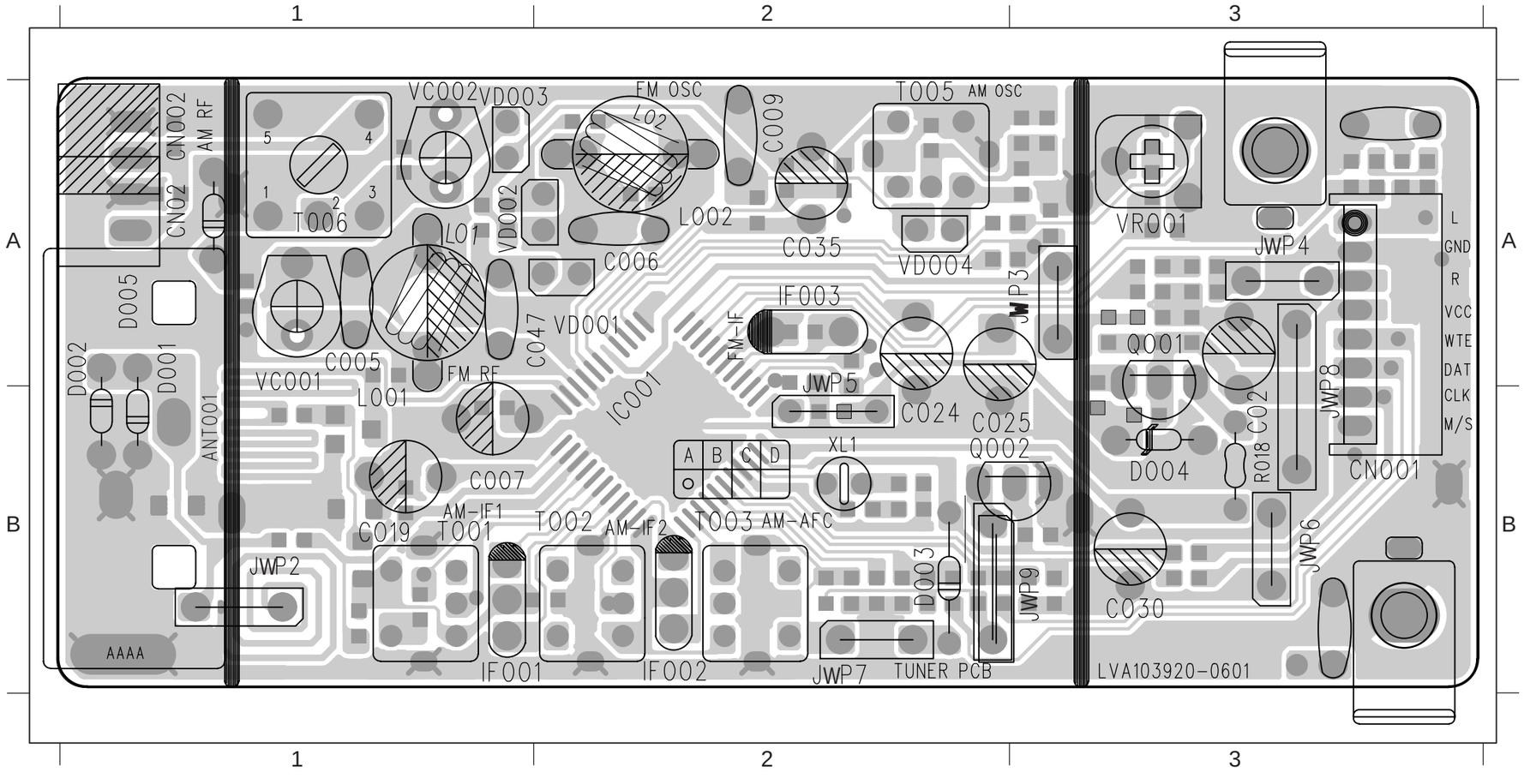


ANT001	A1	R004	A2
C002	A1	R005	B2
C005	A1	R006	A1
C007	A2	R010	C1
C006	B2	R011	C1
C008	B2	R015	B2
C009	B2	R016	B4
C01	C4	R017	C2
C02	C3	R018	B3
C03	A2	R019	C3
C010	B1	R020	B4
C011	C1	R021	C4
C012	B2	R023	B4
C013	C2	R024	B2
C014	C1	R025	C3
C015	C1	R026	C3
C016	C1	R027	B3
C019	A2	R028	B4
C020	B3	R029	B4
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		

6-3

PCB LAYOUT - TUNER BOARD (TOP)

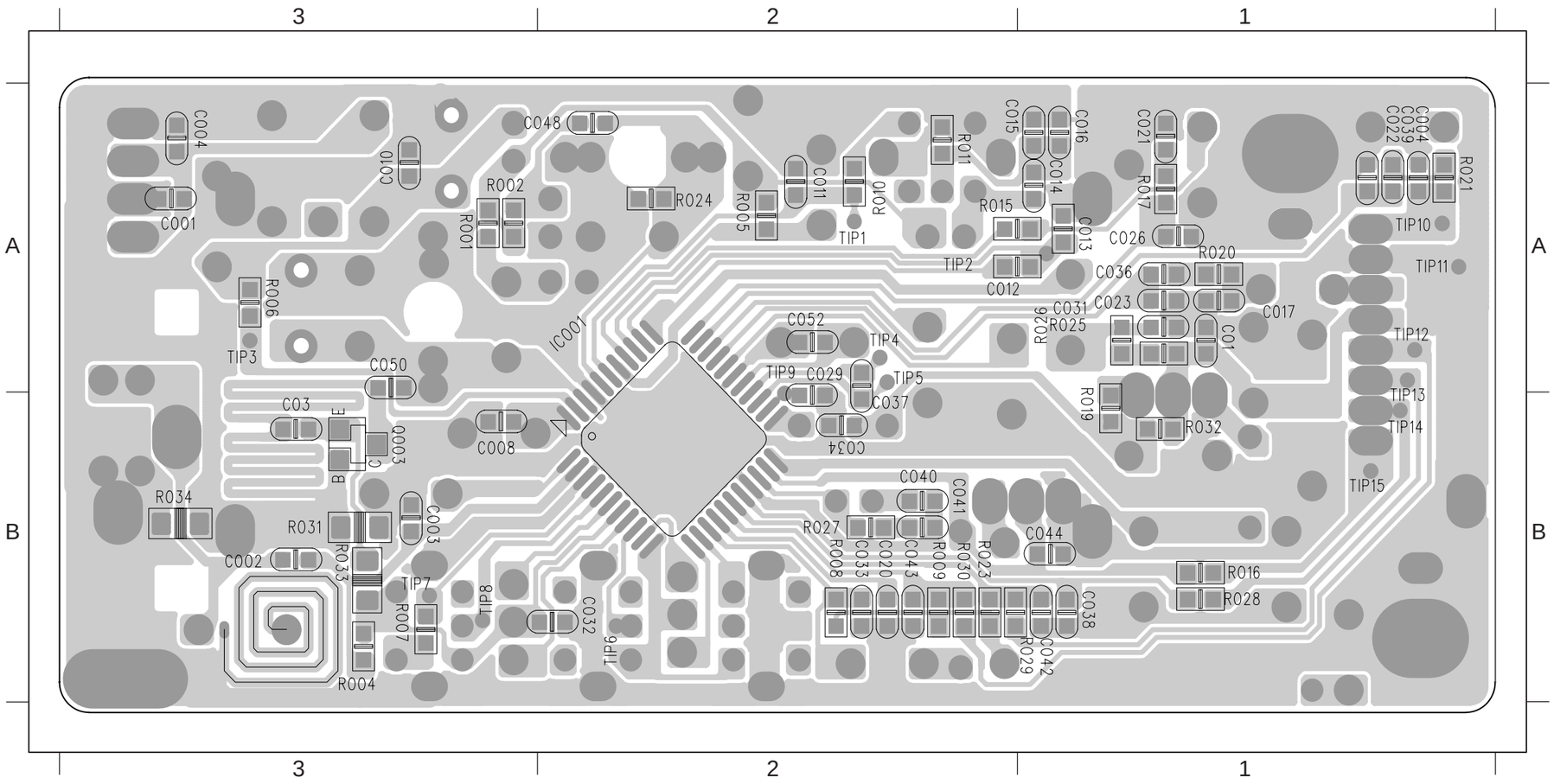
ANT001	B1	C025	B2	D002	A1	IF003	A2	JWP8	A3	T001	B1	VD001	A2
C005	A1	C030	B3	D003	B2	JWP2	B1	JWP9	B3	T002	B2	VD002	A1
C006	A2	C035	A2	D004	B3	JWP3	A3	L02	A2	T003	B2	VD003	A1
C007	B1	C047	A1	D005	A1	JWP4	A3	L001	B1	T005	A2	VD004	A2
C009	A2	CN001	B3	IC001	B2	JWP5	B2	Q001	A3	T006	A1	VR001	A3
C019	B1	CN002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



6-4

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		



POWER BOARD

TABLE OF CONTENTS

Voltage

IC902																			
Pin NO	1	2	3	4	5	6	7	8											
Voltage	0.00	0.00	0.00	-11.60	0.00	0.00	0.00	12.80											

Q901			
Pin NO	D	S	G
Voltage	50.10	111.60	49.50

Q902			
Pin NO	D	S	G
Voltage	-90.50	51.60	-90.50

Q903			
Pin NO	D	S	G
Voltage	187.50	-99.50	-96.60

Q951			
Pin NO	b	c	e
Voltage	0.20	0.00	0.20

Q952			
Pin NO	b	c	e
Voltage	0.20	0.00	0.20

Q953			
Pin NO	b	c	e
Voltage	5.20	5.00	11.70

Q954			
Pin NO	b	c	e
Voltage	0.00	4.70	0.00

Q955			
Pin NO	b	c	e
Voltage	0.00	3.40	0.00

Q956			
Pin NO	b	c	e
Voltage	12.80	2.20	12.90

Q957			
Pin NO	b	c	e
Voltage	0.00	0.20	-0.60

Q958			
Pin NO	b	c	e
Voltage	0.10	4.90	0.00

Q959			
Pin NO	b	c	e
Voltage	0.70	0.00	0.00

Q961			
Pin NO	b	c	e
Voltage	11.50	5.20	0.00

Q962			
Pin NO	b	c	e
Voltage	0.00	11.50	0.00

7-2

CIRCUIT DIAGRAM - POWER BOARD

| | | |

7-3

PCB LAYOUT - POWER BOARD

| | | |

7-4

ELECTRICAL PARTS LIST - POWER BOARD

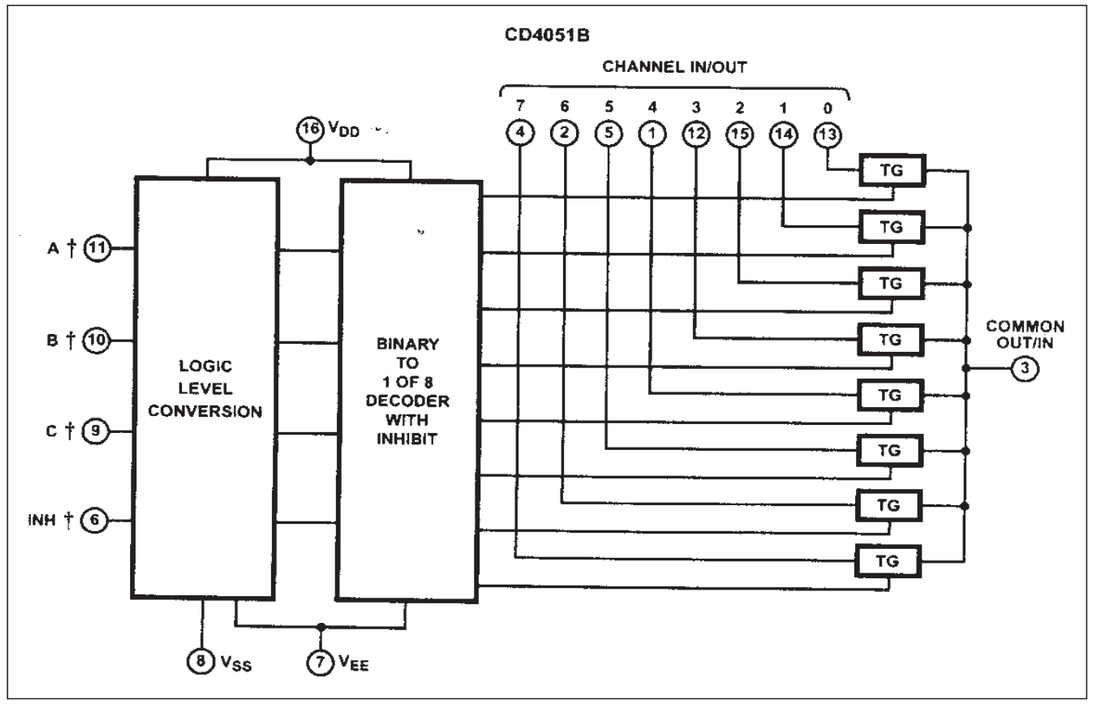
BD901	9965 000 41973	BRIDGE KBU808 8A 800V	
C903	⚠ 9940 000 00932	COND SAFTY 0.47UF 275V 10%	
C904	⚠ 9940 000 05343	COND SAFTY 0.22UF 275V 20%	
C905	⚠ 9965 000 27115	CAP. SAFTY 102PF 250V 20%	
C906	⚠ 9965 000 27115	CAP. SAFTY 102PF 250V 20%	
C909	9965 000 18042	COND DISC 0.01UF 1KV 20%	
C910	9965 000 18042	COND DISC 0.01UF 1KV 20%	
C911	9965 000 27124	COND METAL 1.5UF 250V	
C912	9965 000 20264	COND DISC 470PF 1KV 10%	
C913	9965 000 20264	COND DISC 470PF 1KV 10%	
C914	9965 000 20264	COND DISC 470PF 1KV 10%	
C915	9965 000 27125	COND DISC 0.0022UF 1KV 20%	
C916	9940 000 05235	COND DISC 100PF 1KV 10%	
C920	9940 000 05236	COND DISC 220PF 1KV 10%	
C923	9940 000 05236	COND DISC 220PF 1KV 10%	
C929	9965 000 18042	COND DISC 0.01UF 1KV 20%	
C930	9965 000 18042	COND DISC 0.01UF 1KV 20%	
C931	⚠ 9965 000 27115	CAP.SAFTY 102PF 250V 20%	
C933	⚠ 9965 000 27115	CAP.SAFTY 102PF 250V 20%	
C951	9965 000 20264	COND DISC 470PF 1KV 10%	
C952	9965 000 20264	COND DISC 470PF 1KV 10%	
C953	9965 000 20264	COND DISC 470PF 1KV 10%	
C954	9965 000 20264	COND DISC 470PF 1KV 10%	
C955	9965 000 20264	COND DISC 470PF 1KV 10%	
C956	9965 000 20264	COND DISC 470PF 1KV 10%	
C971	9940 000 05236	COND DISC 220PF 1KV 10%	
C972	9940 000 05236	COND DISC 220PF 1KV 10%	
C973	9940 000 05236	COND DISC 220PF 1KV 10%	
C974	9940 000 05236	COND DISC 220PF 1KV 10%	
C981	9940 000 05236	COND DISC 220PF 1KV 10%	
D904	9940 000 00941	DIODE HER104 1A 300V 50NS	
D905	9940 000 00938	DIODE PR1507 1.5A 1000V	
D951	9965 000 41972	DIODE STPR1620CT 3P	
D952	9940 000 00948	RECTIFIER FEP16AT TO-220AB	
D961	9940 000 00943	DIODE UF3003 3A 200V	
D962	9940 000 05249	DIODE SB360 3A 60V	
D963	9940 000 00941	DIODE HER104 1A 300V 50NS	
D964	9940 000 00941	DIODE HER104 1A 300V 50NS	
F901	⚠ 9940 000 01053	FUSE 6.3A 250V	
IC901	9940 000 05255	IC 8P UC3843AL	
IC902	9940 000 00946	OPTICAL SENSOR 4P	
IC903	9940 000 00946	OPTICAL SENSOR 4P	
IC951	9965 000 41974	IC 8PIN RC4558P	
IC952	9940 000 00951	IC 16PIN KA7500C	
IC953	9940 000 00952	IC 3PIN TL431	
IC953	9940 000 01572	IC 3P TL431	
L952	9965 000 27102	TOROID COIL S1=1TS D0.65X2	
NTC901	9940 000 00957	NTC 5R 5A	
Q901	9965 000 41976	MOSFET FQP9N50C	
Q902	9965 000 41976	MOSFET FQP9N50C	
Q903	9940 000 05348	MOSFET STF3NK80Z N-CH 2.5A	
Q903	9965 000 41975	MOSFET STP2NC60 1.9A 600V 7R	
Q906	4822 130 41198	2SC945P	
Q951	9940 000 05347	XISTR PNP 2SA952-K	
Q952	9940 000 05347	XISTR PNP 2SA952-K	
Q953	4822 130 11336	STP16NF06FP	
Q954	4822 130 41198	2SC945P	
Q955	4822 130 41198	2SC945P	
Q956	9965 000 26946	XISTR PNP 2SB772P/Q	
Q957	4822 130 41198	2SC945P	
Q958	4822 130 41198	2SC945P	
Q959	4822 130 41198	2SC945P	
Q961	9940 000 05347	XISTR PNP 2SA952-K	
Q962	4822 130 41198	2SC945P	
T901	⚠ 9965 000 41977	TRASFO EER3542 200W	
T902	⚠ 9940 000 01057	SW. MODEL TRASFO.	
T903	⚠ 9965 000 41978	TRASFO EE-25L 7P 20W	
TVR901	9965 000 32754	THERMIST 50A 561V	
TVR902	9965 000 27114	VARIS. FOR SUR VOLT. TVR10	
TVR903	9965 000 27114	VARIS. FOR SUR. VOLT. TVR10	
ZD901	9940 000 02067	DIODE ZENR 14.5-15.1V 0.5W	
ZD902	9940 000 02067	DIODE ZENR 14.5-15.1V 0.5W	
ZD954	9940 000 05206	DIODE ZENR 5.6-5.9V 0.5W	

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

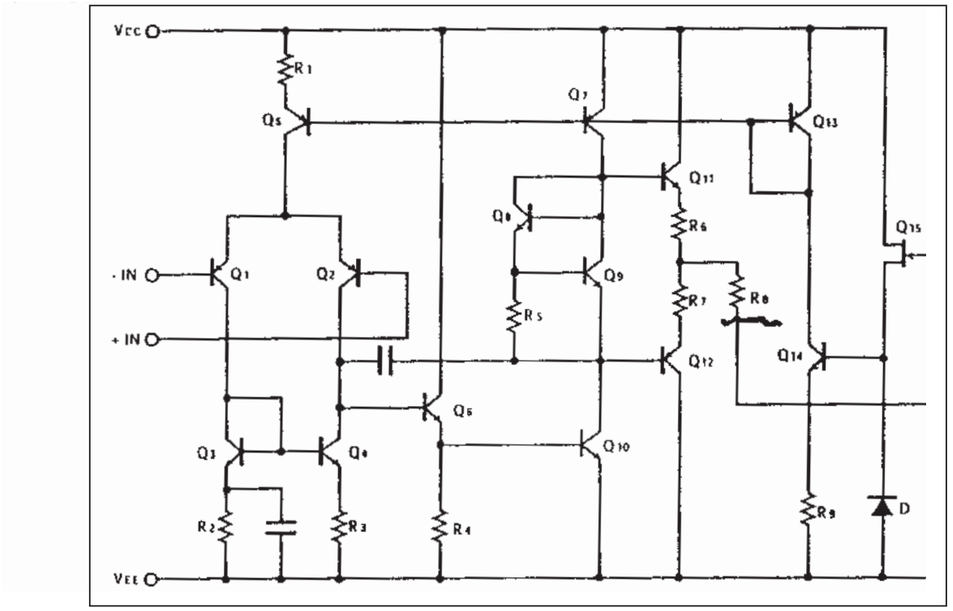
MAIN BOARD

TABLE OF CONTENTS

CD4053BM96 Internal IC DIAGRAM



CO4558A Internal IC diagram



8-2

CIRCUIT DIAGRAM - TOP LEFT

| | | |

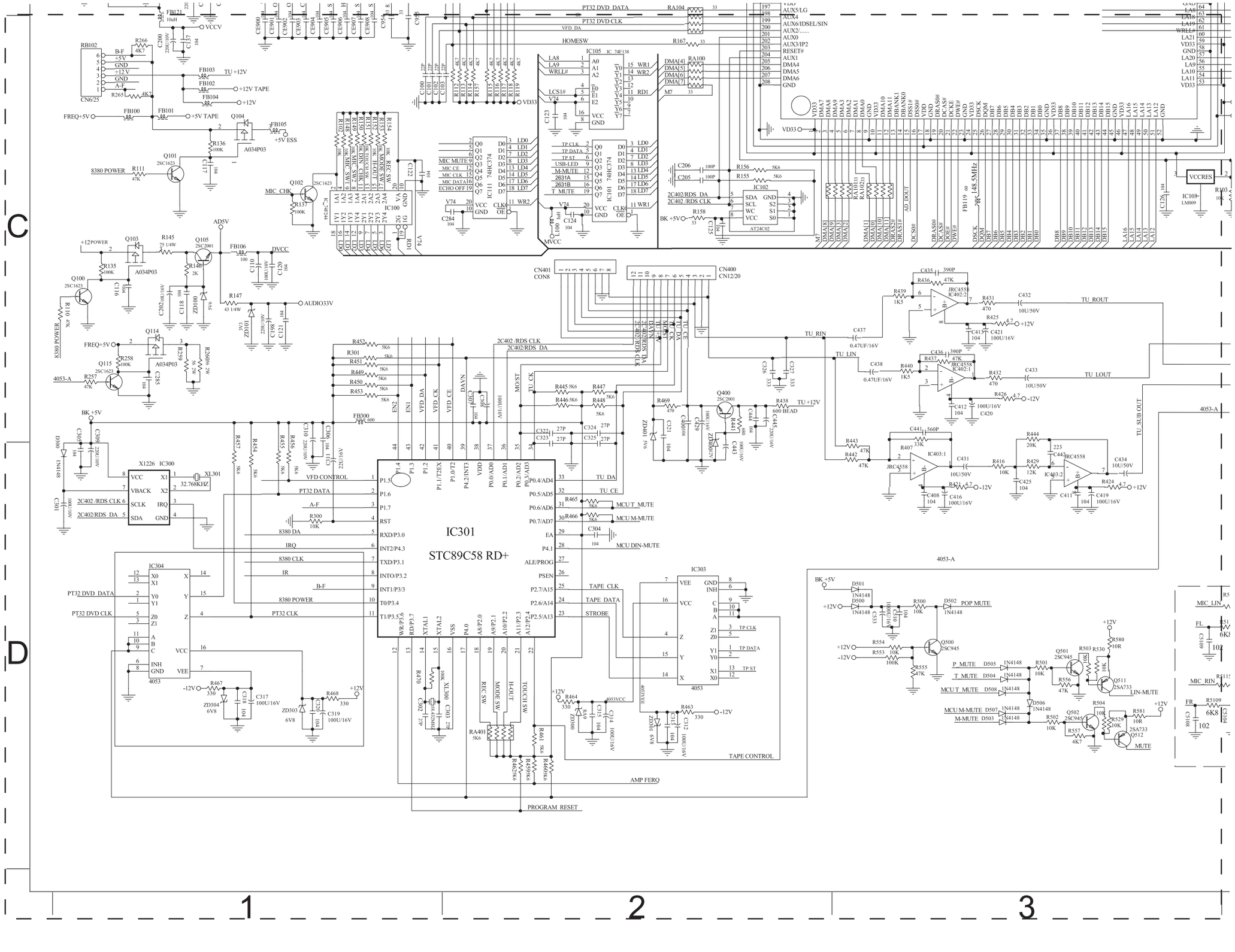
8-3

CIRCUIT DIAGRAM - TOP RIGHT

| | | |

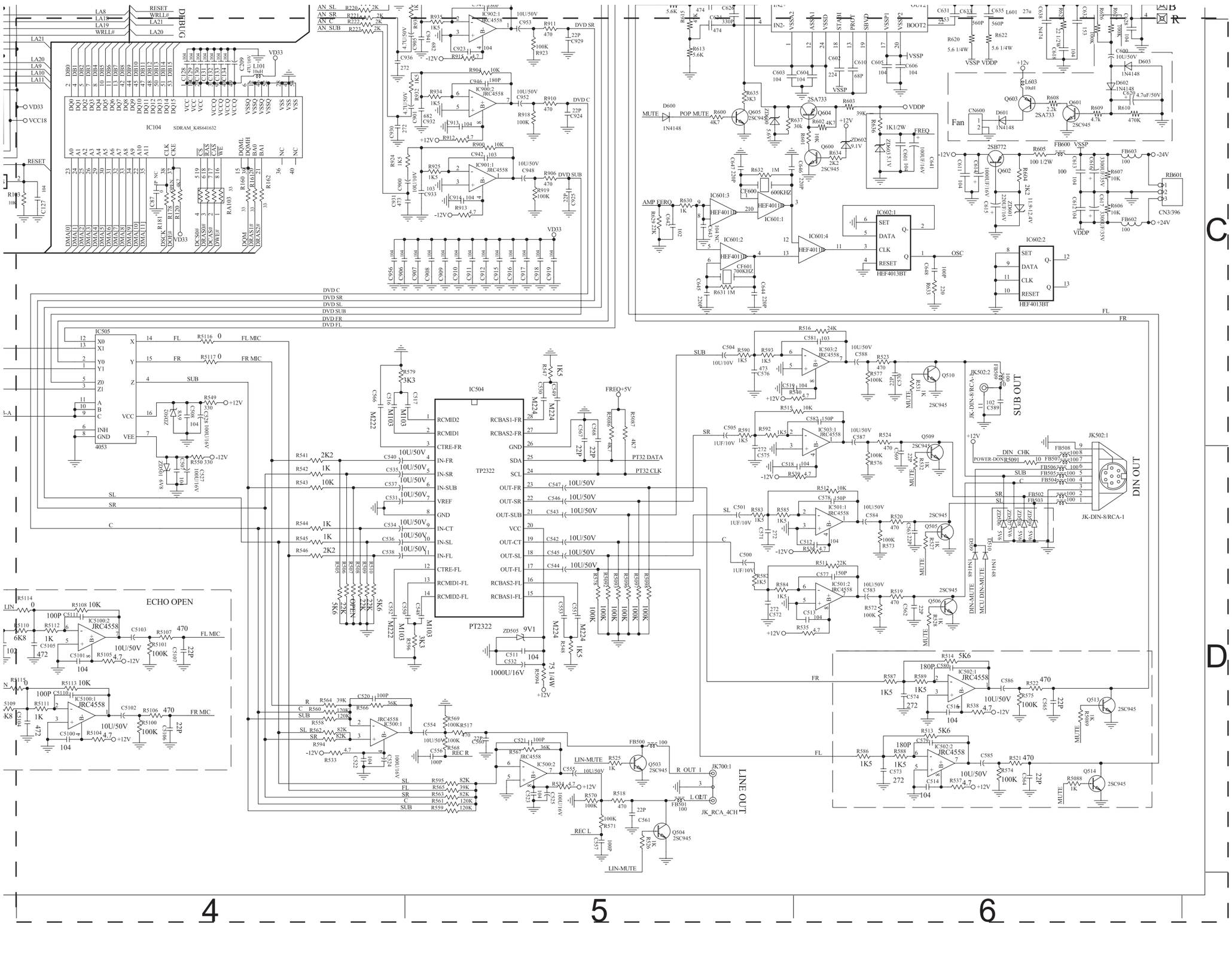
8-4

CIRCUIT DIAGRAM - BOTTOM LEFT



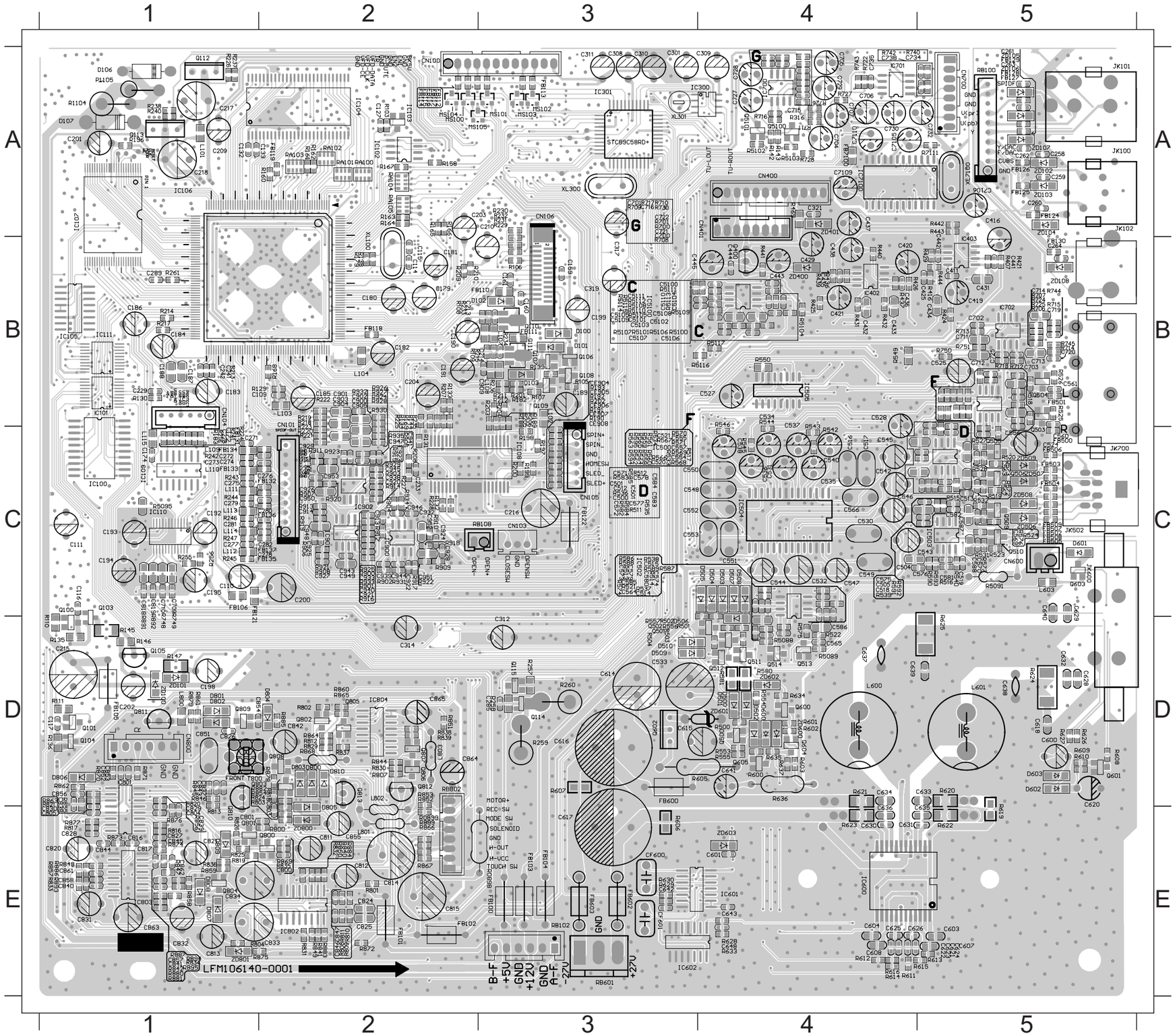
8-5

CIRCUIT DIAGRAM - BOTTOM RIGHT



8-6

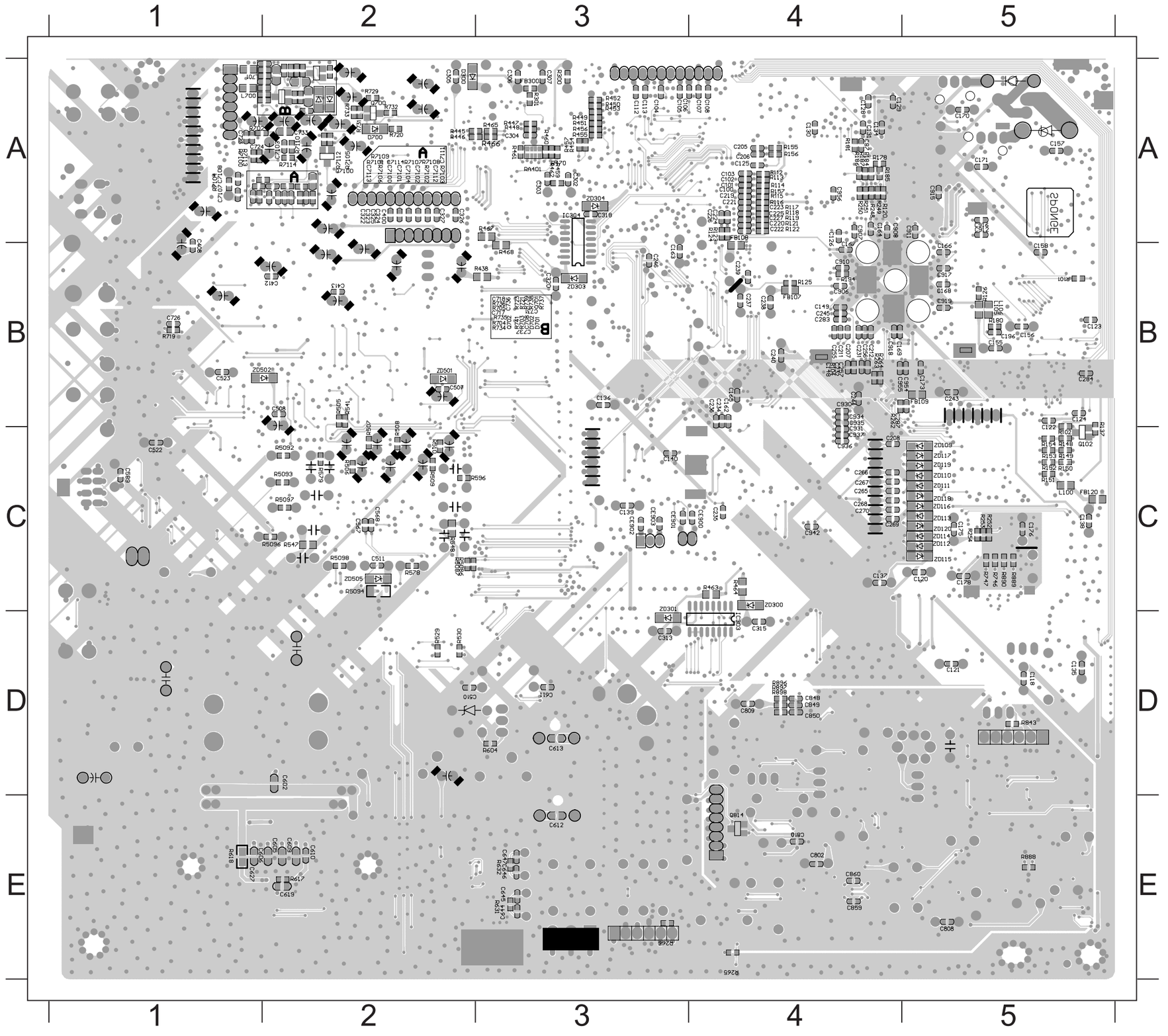
PCB LAYOUT - TOP VIEW



C109	B2	C580	C3	CE906	B3	L801	E2	R241	C1	R742	A4	ZD601	D4
C110	C1	C581	C5	CE907	B3	L802	E2	R242	C1	R743	A4	ZD602	D4
C111	C1	C585	C3	CE908	B3	L803	D2	R243	C1	R744	B5	ZD603	E4
C114	B2	C586	D4	CF600	E3	MS100	A2	R244	C1	R745	B5	ZD800	E2
C115	B2	C588	C5	CF601	E3	MS101	A3	R245	C1	R748	C1	ZD801	E1
C116	C1	C601	E4	CN100	A2	MS102	A3	R246	C1	R749	C1		
C117	D1	C603	E5	CN103	C3	MS103	A3	R247	C1	R750	B5		
C127	A2	C604	E4	CN104	B1	MS104	A2	R256	C1	R751	B5		
C132	A1	C607	E5	CN105	C3	MS105	A3	R257	D3	R800	E2		
C133	A2	C608	E4	CN106	A3	Q100	C1	R258	D3	R801	E2		
C159	B3	C614	D3	CN400	A4	Q101	D1	R259	D3	R802	D2		
C160	B3	C615	D3	CN700	A5	Q103	D1	R260	D3	R803	D2		
C161	B3	C616	D3	CN800	D1	Q104	D1	R261	B2	R804	E1		
C172	C1	C618	D5	D100	B3	Q105	D1	R421	B4	R807	D2		
C174	C1	C621	E5	D101	B3	Q106	B3	R424	B4	R808	E2		
C179	B2	C622	E5	D102	B3	Q107	B3	R425	B4	R809	E2		
C180	B2	C623	E5	D103	B3	Q108	B3	R426	B4	R810	E2		
C181	B2	C624	E5	D106	A1	Q109	B3	R431	B4	R811	E2		
C182	B2	C625	E4	D107	A1	Q110	B3	R432	B4	R812	D2		
C183	B1	C626	E5	D500	D4	Q111	B3	R438	B4	R813	E1		
C184	B1	C628	D5	D501	D4	Q112	A1	R442	B4	R816	E1		
C185	B2	C629	C5	D502	D4	Q113	A1	R443	B4	R817	E1		
C186	B1	C630	E4	D503	C4	Q114	D3	R469	B4	R818	D2		
C187	B1	C631	E5	D504	C4	Q115	D3	R500	D4	R819	E1		
C188	B1	C632	D5	D505	C4	Q400	B4	R501	D3	R820	E1		
C189	B3	C633	D5	D506	D3	Q500	D4	R502	D3	R821	E1		
C190	B2	C634	D4	D507	C4	Q501	D4	R503	D4	R824	D2		
C191	B2	C635	E5	D508	C4	Q502	D3	R504	D3	R825	E1		
C192	C1	C636	E4	D509	D3	Q503	B5	R5088	D4	R826	E1		
C193	C1	C637	D4	D510	D3	Q504	B5	R5089	D4	R829	D2		
C194	C1	C638	D5	D600	D4	Q510	C5	R5091	C5	R830	D2		
C195	C1	C639	D5	D800	D2	Q511	D4	R5095	C1	R831	E2		
C198	B1	C640	C5	D801	D1	Q512	D4	R5116	B4	R832	E2		
C199	B3	C641	D4	D802	D1	Q513	D4	R5117	B4	R833	E1		
C200	C2	C642	E3	D803	D2	Q514	D4	R513	C3	R834	E1		
C201	A1	C648	E4	D804	D2	Q600	D4	R514	C3	R835	E2		
C202	D1	C700	A3	D805	D2	Q602	D3	R516	C5	R836	E1		
C203	A3	C701	A3	D806	D1	Q604	D4	R517	C3	R837	D2		
C204	B2	C702	B5	D807	E1	Q605	D4	R518	B5	R838	D2		
C209	A1	C703	B5	D808	E1	Q800	E2	R521	C3	R839	D2		
C210	A3	C704	A4	D809	E1	Q801	E1	R522	D4	R840	E2		
C213	B2	C705	A4	D810	D2	Q802	D2	R523	C5	R841	E2		
C214	B3	C706	A4	FB100	E3	Q803	D2	R525	B5	R842	E1		
C215	D1	C707	A4	FB101	E2	Q804	E1	R526	B5	R844	D2		
C216	C3	C709	C1	FB102	E2	Q805	D2	R531	C5	R845	D1		
C217	A1	C710	C1	FB103	E3	Q806	D2	R533	C3	R846	D1		
C218	A1	C711	B5	FB104	E3	Q807	D2	R534	C3	R847	E1		
C228	C1	C712	B5	FB105	D1	Q808	D2	R537	C3	R848	E1		
C229	B1	C713	B5	FB106	C1	Q809	D1	R538	C3	R849	E2		
C233	C2	C714	B5	FB110	B3	Q810	E1	R539	C4	R850	E2		
C241	B1	C715	A4	FB111	B3	Q811	D1	R540	C5	R851	D2		
C242	B1	C716	A3	FB112	A2	Q812	D2	R543	C4	R852	D2		
C258	A5	C719	B5	FB113	A3	Q813	D2	R546	C4	R853	D2		
C259	A5	C720	B5	FB114	A2	R0898	E3	R549	B4	R854	D2		
C260	A5	C721	A3	FB115	A2	R0899	E2	R550	B4	R855	E1		
C261	A5	C722	A3	FB116	A2	R103	A2	R553	D4	R856	E1		
C262	A5	C725	B5	FB117	A2	R104	B4	R554	D4	R857	E1		
C263	A5	C727	A4	FB118	B2	R105	B3	R555	D4	R858	E1		
C264	B5	C728	A4	FB119	A2	R106	B3	R556	D3	R859	E1		
C265	A5	C729	A4	FB121	C1	R107	B3	R557	D3	R861	D1		
C271	C1	C730	A4	FB122	C3	R108	B2	R558	C3	R862	D1		
C272	C1	C732	A5	FB124	A5	R109	B3	R559	C3	R863	E1		
C273	C1	C734	A5	FB125	A5	R110	D1	R560	C3	R864	D2		
C274	C1	C735	A4	FB126	A5	R1104	A1	R561	C3	R865	D2		
C275	C1	C738	A4	FB127	A5	R1105	A1	R562	C3	R866	E2		
C276	C2	C800	E2	FB128	A5	R111	D1	R563	C3	R867	E2		
C277	C1	C801	E1	FB129	A5	R129	B2	R564	C3	R868	D2		
C278	C2	C803	D2	FB130	B5	R130	B1	R565	C3	R869	E2		
C279	C1	C804	E1	FB131	C1	R131	C2	R566	C3	R870	D1		
C280	C2	C805	E1	FB132	C2	R132	C2	R567	C3	R871	D1		
C281	C1	C809	D2	FB133	C1	R133	B2	R568	C3	R872	E2		
C282	C2	C811	E2	FB134	C1	R134	B2	R569	C3	R873	E1		
C285	D3	C812	E2	FB135	C2	R135	D1	R570	C3	R874	E1		
C303	D2	C813	E1	FB136	C2	R136	D1	R571	C3	R875	E2		
C308	A3	C814	E2	FB137	C2	R138	B2	R574	C3	R876	E1		
C309	A4	C815	E2	FB500	C5	R139	B3	R575	D4	R877	E1		
C310	A3	C816	E1	FB501	B5	R142	A4	R577	C5	R878	D2		
C311	A3	C817	E1	FB505	C5	R143	A4	R580	D4	R879	D1		
C312	D3	C818	C1	FB506	C5	R144	B2	R581	D4	R880	E1		
C314	D2	C819	C1	FB507	C5	R145	C1	R586	D4	R881	E1		
C317	A3	C820	E1	FB508	C5	R146	D1	R587	C3	R882	D2		
C319	B3	C821	E1	FB509	C5	R147	D1	R588	C3	R883	E2		
C400	A4	C824	E2	FB600	D3	R158	A2	R589	C3	R884	E2		
C416	B4	C825	E2	FB602	E3	R160	A2	R590	C5	R885	D2		
C419	B5	C826	D1	FB603	E3	R161	A2	R593	C5	R886	E1		
C420	B4	C827	E1	IC100	C1	R162	A2	R594	C3	R887	E1		
C421	B4	C828	E1	IC101	B1	R163	A2	R595	C3	R891	C1		
C429	A4	C829	E1	IC102	A2	R164	A2	R600	D4	R892	C1		
C432	B4	C830	E1	IC103	A2	R165	A2	R601	D4	R893	E1		
C433	B4	C831	E1	IC104	A2	R166	A2	R602	D4	R894	E1		
C434	B4	C832	E1	IC105	B1	R167	A2	R603	D4	R895	E1		
C437	A4	C833	E2	IC106	B2	R168	B2	R605	D4	R899	E2		
C438	A4	C834	E1	IC107	A1	R169	B2	R606	E3	R900	C2		
C443	B4	C837	D1	IC108	C3	R183	C1	R607	D3	R901	C2		
C445	B4	C838	E1	IC109	C1	R188	B3	R611	E4	R902	C2		
C504	C4	C839	E1	IC110	C1	R189	B3	R612	E4	R906	C2		
C514	C3	C840	E1	IC300	A4	R190	B3	R613	E5	R908	C2		
C515	C3	C841	E1	IC301	A3	R191	B3	R614	E4	R909	C2		
C516	C4	C842	D2	IC402	B4	R192	B3	R615	E5	R912	C2		
C517	C4	C843	D1	IC403	B4	R193	B3	R616	E4	R913	C2		
C518	C4	C844	E1	IC500	C3	R196	A1	R619	D5	R916	C2		
C519	C5	C845	E1	IC502	C3	R197	C3	R620	D5	R917	C2		
C520	C3	C846	E2	IC503	C4	R198	C3	R621	D4	R919	C2		
C521	C3	C847	E2	IC504	C4	R199	C3	R622	E5	R921	C2		
C524	C5	C851	D1	IC505	B4	R200	C3	R623	E4	R922	C2		
C525	B5	C852	D1	IC600	E4	R201	B3	R624	D5	R924	B2		
C527	B4	C853	D1	IC601	E4	R203	B3	R625	D5	R925	C2		
C528	B4	C854	D1	IC602	E3	R204	B3	R628	E4	R926	B2		
C530	C4	C855	E2	IC700	A4	R205	B3	R629	E3	R927	B2		
C531	C4	C856	D1	IC701	A4	R206	B3	R630	E3	R931	C2		
C532	C4	C857	E1	IC702	B5	R207	B2	R633	E4	R933	C2		
C533	D3	C858	E1	IC801	D1	R208	C2	R634	D4	RA100	A2		
C537	C4	C861	E1	IC802	E2	R209	B2	R635	D4	RA101	A2		
C538	C4	C862	E1	IC803	E1	R210	B2	R636	D4	RA102	A2		
C540	C4	C863	E1	IC804	D2	R211	B3	R637	D4	RA103	A2		
C543	C4	C864	D2	IC901	D2	R212	B3	R700	A3	RA104	A2		
C544	C4	C865	D2	JK100	A5	R213	B1	R701	A3	RA105	A2		
C547	C4	C900	B2	JK101	A5	R214	B1	R706	B5	RB100	A5		
C548	C3	C902	B2	JK102	B5	R215	B3	R707	B5	RB102	E3		
C549	C4	C903	B2	JK502	C5	R216	C1	R708	A3	RB108	C3		
C550	C3	C909	B3	JK600	C5	R217	B1	R709	A3	RB601	E3		
C551	C4	C913	D2	JK700	C5	R218	B2	R710	A3	RB802	E3		
C552	C3	C914	C2	L101	A1	R219	B2	R711	A4	T800	D2		
C553	C3	C921	C2	L102	B3	R223	B2	R712	B5	XL100	B2		
C554	C3	C922	C2	L103	B2	R224	C1	R713	B5	XL300	A3		
C555	C3	C925	C2	L104	B2	R225	B2	R714	B5	XL301	A3		
C556	B5	C927	C2	L107	B3	R226	A1	R715	B5	ZD100	D1		
C557	C3	C928	C2	L108	B3	R227	C2	R716	A4	ZD101	D1		
C560	B5	C933	C2	L109	C1	R228	C2	R717	A3	ZD102	B3		
C561	B5	C939	C2	L110	C1	R231	A3	R718	B5	ZD103	A5		
C564	C3	C940	C2	L111	C1	R232	A3	R722	A4	ZD104	A5		
C565	D4	C943	C2	L112	C1	R233	B2	R724	B5	ZD105	A5		
C566	C4	C944	C2	L113	C1	R234	B3	R725	BB	ZD106	A5		
C570	C5	C948	C2	L114	C1	R235	B2	R726	A4	ZD107	A5		
C573	C3	C949	C2	L115	C1	R236	B3	R727	A4	ZD108	B4		
C574	C3	C951	C2	L600	D4	R237	A1	R728	A4	ZD400	B4		
C576	C5	CE904	B3	L601	D5	R238	A1	R730	A3	ZD401	B3		
C579	C3	CE905	B3	L800	D1	R240	A1	R740	A5	ZD600	D4		

8-7

PCB LAYOUT - Bottom VIEW



ELECTRICAL PARTS LIST - MAIN BOARD

C616	9965 000 19963	COND ELECT 3300UF 35V 20%	MS102	9965 000 41970	FET CM70A02 SOT23 KOTEX	Q809	9940 000 00921	XISTR PNP 2SA812 HFE:200-400
C617	9965 000 19963	COND ELECT 3300UF 35V 20%	MS103	9965 000 41970	FET CM70A02 SOT23 KOTEX	Q810	4822 130 41198	2SC945P
C851	9965 000 41963	COND PROP 0.022UF 100V 5%	MS104	9965 000 41970	FET CM70A02 SOT23 KOTEX	Q811	9940 000 00864	FET J111TO92 40V 20MA
CF600	9965 000 23595	RES 2P 600KHZ	MS105	9965 000 41970	FET CM70A02 SOT23 KOTEX	Q812	9940 000 05347	XISTR PNP 2SA952-K
CF601	9940 000 00823	RESONATOR 2PIN 700KHZ	Q100	9940 000 00915	XISTR NPN 2SC1623	Q813	9940 000 05347	XISTR PNP 2SA952-K
IC100	9940 000 00838	IC 20PIN 74F244	Q101	9940 000 00915	XISTR NPN 2SC1623	Q814	9940 000 00915	XISTR NPN 2SC1623
IC101	9965 000 41967	IC 20P SN74HC374PW	Q102	9940 000 00915	XISTR NPN 2SC1623	R259	9940 000 05248	METAL OXIDE RES 56R 3W /-5%
IC102	9940 000 05208	IC 8P TU24C02CS2BF CMOS	Q103	9965 000 41969	FET AO3403 ALPHA -30V/-2.6A	R260	9940 000 05248	METAL OXIDE RES 56R 3W /-5%
IC103	9965 000 41284	IC 3P STM809SWX6F 3.0V	Q104	9965 000 41969	FET AO3403 ALPHA -30V/-2.6A	RA100	9940 000 05231	RES.ARRAY 33R 1/16W 5%
IC104	9965 000 38430	IC 54P NT5SV8M16DS-6K	Q105	4822 130 41651	2SC2001L	RA101	9940 000 05231	RES.ARRAY 33R 1/16W 5%
IC105	9940 000 00839	IC 16P 74F138D	Q106	3141 018 51690	TRA SM 2SK3018	RA102	9940 000 05231	RES.ARRAY 33R 1/16W 5%
IC106	9965 000 41966	IC 208P ES8380FCC PQFP	Q107	3141 018 51690	TRA SM 2SK3018	RA103	9940 000 05231	RES.ARRAY 33R 1/16W 5%
IC107	9965 100 00799	IC 48P EN29LV160AB-70TCP SW.	Q108	9965 000 41293	XISTR NPN PMBT3904	RA104	9940 000 05231	RES.ARRAY 33R 1/16W 5%
IC108	9940 000 05214	IC 28P V5888S	Q109	9965 000 41293	XISTR NPN PMBT3904	RA105	9940 000 05231	RES.ARRAY 33R 1/16W 5%
IC109	9965 000 23948	IC 14P 74HCU04D TSOP	Q110	9965 000 26927	XISTR PNP 2SB1132RT100	RA401	9965 000 41964	RES. ARRAY 4.7KR 1/16W 5%
IC110	9965 000 41287	IC 24P CE2631 4-CH STEREO	Q111	9965 000 26927	XISTR PNP 2SB1132RT100	T800	9940 000 00866	OSC COIL REC 3MH
IC300	9965 000 41965	IC 8P X1226S8 SOIC INTERSIL	Q112	9965 000 26946	XISTR PNP 2SB772P/Q	XL100	9940 000 05201	X'TAL 27MHZ /-20PPM H=3.5MM
IC301	9965 000 41968	IC 44P MPC89E58AF PQFP	Q113	9965 000 26946	XISTR PNP 2SB772P/Q	XL300	9965 000 41961	XTAL 18.432MHZ 30PPM 20PF
IC303	9965 000 29612	IC 16P TC4053BFN	Q114	9965 000 41969	FET AO3403 ALPHA -30V/-2.6A	XL301	9965 000 41962	XTAL 32.768KHZ /-5PPM
IC304	9965 000 29612	IC 16P TC4053BFN	Q115	9940 000 00915	XISTR NPN 2SC1623	ZD100	9940 000 05476	DIODE ZENER 5.6V 0.5W 5%
IC402	9965 000 29611	IC 8P CO4558A	Q400	4822 130 41651	2SC2001L	ZD101	9965 000 41971	CHIP ZENER 3.3V 5% 0.5W
IC403	9965 000 29611	IC 8P CO4558A	Q500	9940 000 00915	XISTR NPN 2SC1623	ZD102	9940 000 05476	DIODE ZENER 5.6V 0.5W 5%
IC500	9965 000 29611	IC 8P CO4558A	Q501	9940 000 00915	XISTR NPN 2SC1623	ZD103	9940 000 05476	DIODE ZENER 5.6V 0.5W 5%
IC502	9965 000 29611	IC 8P CO4558A	Q502	9940 000 00915	XISTR NPN 2SC1623	ZD104	9940 000 05476	DIODE ZENER 5.6V 0.5W 5%
IC503	9965 000 29611	IC 8P CO4558A	Q503	9940 000 00915	XISTR NPN 2SC1623	ZD105	9940 000 05476	DIODE ZENER 5.6V 0.5W 5%
IC504	9940 000 00845	IC 28P PT2322-S	Q504	9940 000 00915	XISTR NPN 2SC1623	ZD106	9940 000 05476	DIODE ZENER 5.6V 0.5W 5%
IC505	9965 000 29612	IC 16P TC4053BFN	Q510	9940 000 00915	XISTR NPN 2SC1623	ZD107	9940 000 05476	DIODE ZENER 5.6V 0.5W 5%
IC600	9940 000 00846	IC 24PIN TDA8920BTH	Q511	9940 000 00921	XISTR PNP 2SA812 HFE:200-400	ZD108	9940 000 05476	DIODE ZENER 5.6V 0.5W 5%
IC601	9940 000 00848	IC 14PIN HEF4011BT(D)	Q512	9940 000 00921	XISTR PNP 2SA812 HFE:200-400	ZD401	9940 000 05476	DIODE ZENER 5.6V 0.5W 5%
IC602	5322 209 14477	HEF4013BT	Q513	9940 000 00915	XISTR NPN 2SC1623	ZD501	9965 000 41294	DIODE BZV55-C6V2 SOD80C
IC700	9965 000 29611	IC 8P CO4558A	Q514	9940 000 00915	XISTR NPN 2SC1623	ZD502	9965 000 41294	DIODE BZV55-C6V2 SOD80C
IC701	9965 000 29611	IC 8P CO4558A	Q600	9940 000 00915	XISTR NPN 2SC1623	ZD505	9940 000 05478	DIODE ZENER 9.1V 5% 0.5W
IC702	9965 000 29611	IC 8P CO4558A	Q602	9965 000 26946	XISTR PNP 2SB772P/Q	ZD600	9940 000 05476	DIODE ZENER 5.6V 0.5W 5%
IC801	4822 209 32919	HEF4952BT	Q604	9940 000 00921	XISTR PNP 2SA812 HFE:200-400	ZD603	9940 000 05476	DIODE ZENER 5.6V 0.5W 5%
IC802	4822 209 32919	HEF4952BT	Q605	9940 000 00915	XISTR NPN 2SC1623	ZD800	9965 000 38424	CHIP ZENER 7.79V-8.61V 0.5W
IC803	9322 140 00668	IC SM AN7323S (MATJ)	Q700	9940 000 00915	XISTR NPN 2SC1623	ZD801	9940 000 05478	DIODE ZENER 9.1V 5% 0.5W
IC804	9940 000 01587	IC 16P HEF4094BT	Q701	9940 000 00915	XISTR NPN 2SC1623			
IC900	9965 000 29611	IC 8P CO4558A	Q702	9940 000 00915	XISTR NPN 2SC1623			
IC901	9965 000 29611	IC 8P CO4558A	Q800	9940 000 00915	XISTR NPN 2SC1623			
JK100	9965 000 23599	RCA+DIN JK 1RCA+4P DIN YEL	Q801	9940 000 00915	XISTR NPN 2SC1623			
JK101	9940 000 00857	RCA JACK 3P R-B-G	Q802	9940 000 00915	XISTR NPN 2SC1623			
JK102	9965 000 17363	RCA JACK 1P W/GND P	Q803	9940 000 00915	XISTR NPN 2SC1623			
JK502	9940 000 00861	RCA+DIN JACK 1RCA+8P DIN BLK	Q804	9940 000 00915	XISTR NPN 2SC1623			
JK600	9940 000 00862	SPK JACK 4P RED-WHT-BLK-BLK	Q805	9940 000 00915	XISTR NPN 2SC1623			
JK700	9940 000 00859	RCA JACK 4P W-W/R-R AUDIO IN	Q806	9940 000 00915	XISTR NPN 2SC1623			
MS100	9965 000 41970	FET CM70A02 SOT23 KOTEX	Q807	9940 000 00915	XISTR NPN 2SC1623			
MS101	9965 000 41970	FET CM70A02 SOT23 KOTEX	Q808	9940 000 00921	XISTR PNP 2SA812 HFE:200-400			

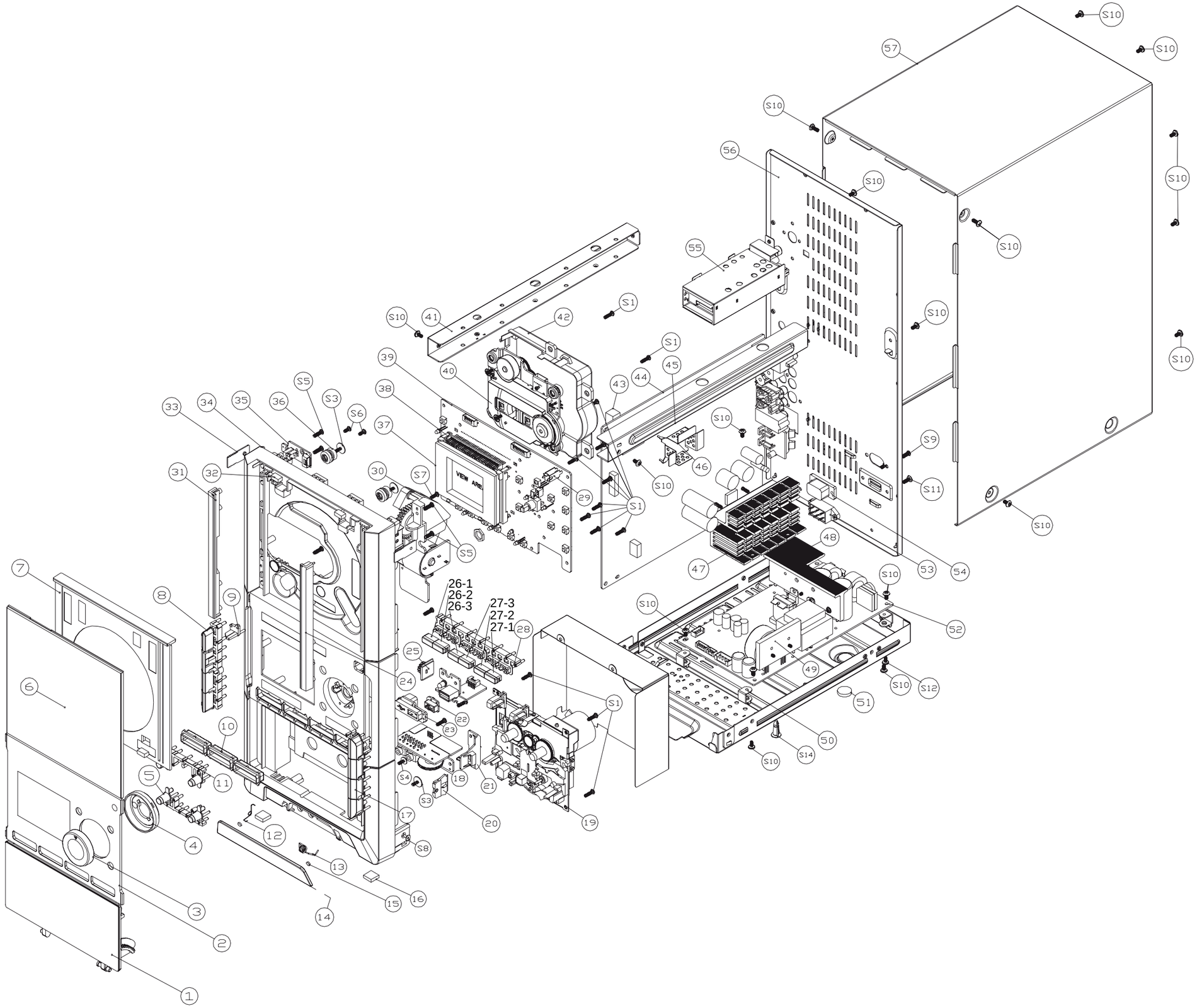
Note: **Only these parts mentioned in the list are normal service parts.**

8-8

ELECTRICAL PARTS LIST - MAIN BOARD

9-1

SET MECHANICAL EXPLODED VIEW



9-2

MECHANICAL & ACCESSORIES PARTS LIST

01	9965 000 41920	CASSETTE DOOR
02	9965 000 41941	DISPLAY LENS
03	9965 000 41931	VOLUME KNOB
04	9965 000 41942	VOLUME LIGHT GUIDE
05	9965 000 41934	FUNCTION BUTTON ROUND DN
06	9965 000 41940	DVD DOOR LENS
07	9965 000 41919	DVD DOOR
08	9965 000 41928	FUNCTION BUTTON SL
09	9965 000 41945	STANDBY LED LIGHT GUIDE
10	9965 000 41943	FUNCTION BUTTON LIGHT GUIDE
11	9965 000 41930	FUNCTION BUTTON ROUND UP
12	9965 000 41952	SPRING SWPA D0.3MM OD5MM
13	9965 000 41951	CASS DOOR SPRING D1MM
14	9965 000 41921	MIC PHONE DOOR
17	9965 000 41932	FUNCTION BUTTON SR
19	9965 000 41953	TAPE DECK W991S-391BCR
20	9940 000 01538	PUSH-CATCH RIGHT
21	9940 000 01515	BRACKET RIGHT
22	9965 000 41946	USB LIGHT GUIDE
23	9965 000 41936	USB DIRECT
24	9965 000 41927	DOOR SLIDE R
25	9940 000 01547	DAMPER ASSY
26-1	9965 000 41929	FUNCTION BUTTON COVER L1
26-2	9965 000 41935	FUNCTION BUTTON COVER L2
26-3	9965 000 41938	FUNCTION BUTTON COVER L3
27-1	9965 000 41933	FUNCTION BUTTON COVER R1
27-2	9965 000 41937	FUNCTION BUTTON COVER R2
27-3	9965 000 41939	FUNCTION BUTTON COVER R3
28	9965 000 41944	FUNCTION BUTTON BASE
30	9965 000 42570	DOOR GEAR ASSY
31	9965 000 41926	DOOR SLIDE L
34	9965 000 41922	FRONT PANEL
36	9965 000 22117	DAMPER-FRONT RUBBER
40	9965 000 41918	DVD MODULE
51	9965 000 41948	RUBBER FOOT D14XT3.0MM
55	9965 000 26963	TUNER PACK KST-F404HA-2B

⚠	9940 000 01054	LINE CORD 2P 2000MM
	9940 000 02731	FM ANTENNA 1500MM
	9965 000 41917	TUNER PCB ASS'Y
	9965 000 41947	PULLEY
	9965 000 41949	BELT RUBBER D33.5MM
	9965 000 42813	LEFT MAIN SPK ASS'Y 100W
	9965 000 42814	RIGHT MAIN SPK ASS'Y 100W
	9940 000 00924	RCA CABLE 1500MM
	9965 000 23580	RCA CABLE 1500MM OD2.6MM
	9965 000 23267	RCA CABLE 1200MM OD2.6X5.2
	9965 000 38289	AM LOOP ANT 1300MM
	9965 000 41954	REMOTE CONTROL 45KEY

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

REVISION LIST

1.0 Manual 3141 785 31180

Initial Service Manual released.

1.1 Manual 3141 785 31181

In this version, change IC107 Flash IC to programmed IC on page 8-8.