SERVICE MANUAL

MODEL: XA64 (XAS64F)

MICRO Hi-Fi SYSTEM

SERVICE MANUAL

MODEL: XA64 (XAS64F)

CAUTION

BEFORE SERVICING THE UNIT, READ THE “SAFETY PRECAUTIONS” IN THIS MANUAL.

P/NO : AFN73250952

OCTOBER, 2009

LG

CONTENTS

SECTION 1

SUMMARY

CONTENTS

PRODUCT SAFETY SERVICING GUIDELINES FOR A/V PRODUCTS

IMPORTANT SAFETY NOTICE

This manual was prepared for use only by properly trained audio-video service technicians.

When servicing this product, under no circumstances should the original design be modified or altered without permission from LG Corporation. All components should be replaced only with types identical to those in the original circuit and their physical location, wiring and lead dress must conform to original layout upon completion of repairs.

Special components are also used to prevent x-radiation, shock and fire hazard. These components are indicated by the letter "x" included in their component designators and are required to maintain safe performance. No deviations are allowed without prior approval by LG Corporation.

Circuit diagrams may occasionally differ from the actual circuit used. This way, implementation of the latest safety and performance improvement changes into the set is not delayed until the new service literature is printed.

CAUTION : Do not attempt to modify this product in any way. Never perform customized installations without manufacturer's approval. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury.

Service work should be performed only after you are thoroughly familiar with these safety checks and servicing guidelines.

GRAPHIC SYMBOLS

The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature.

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the service personnel to the presence of non-insulated "dangerous voltage" that may be of sufficient magnitude to constitute a risk of electric shock.

The pictorial representation of a fuse and its rating within an equilateral triangle is intended to convey to the service personnel the following fuse replacement caution notice:

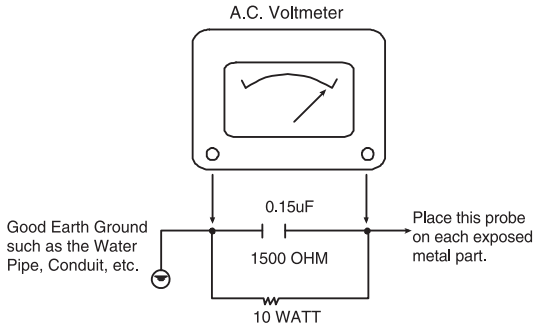
CAUTION : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

SERVICE INFORMATION

While servicing, use an isolation transformer for protection from AC line shock. After the original service problem has been corrected, make a check of the following:

FIRE AND SHOCK HAZARD

1. Be sure that all components are positioned to avoid a possibility of adjacent component shorts. This is especially important on items trans-ported to and from the repair shop.
2. Verify that all protective devices such as insulators, barriers, covers, shields, strain reliefs, power supply cords, and other hardware have been reinstalled per the original design. Be sure that the safety purpose of the polarized line plug has not been defeated.
3. Soldering must be inspected to discover possible cold solder joints, solder splashes, or sharp solder points. Be certain to remove all loose foreign particles.
4. Check for physical evidence of damage or deterioration to parts and components, for frayed leads or damaged insulation (including the AC cord), and replace if necessary.
5. No lead or component should touch a high current device or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces must be avoided.
6. After reassembly of the set, always perform an AC leakage test on all exposed metallic parts of the cabinet (the channel selector knobs, antenna terminals, handle and screws) to be sure that set is safe to operate without danger of electrical shock. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST. Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10 watt resistor, paralleled by a .15 mfd 150V AC type capacitor between a known good earth ground water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and .15 mfd capacitor. Reverse the AC plug by using a non-polarized adaptor and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75 volts RMS. This corresponds to 0.5 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



TIPS ON PROPER INSTALLATION

1. Never install any receiver in a closed-in recess, cubbyhole, or closely fitting shelf space over, or close to, a heat duct, or in the path of heated air flow.
2. Avoid conditions of high humidity such as: outdoor patio installations where dew is a factor, near steam radiators where steam leakage is a factor, etc.
3. Avoid placement where draperies may obstruct venting. The customer should also avoid the use of decorative scarves or other coverings that might obstruct ventilation.
4. Wall- and shelf-mounted installations using a commercial mounting kit must follow the factory-approved mounting instructions. A product mounted to a shelf or platform must retain its original feet (or the equivalent thickness in spacers) to provide adequate air flow across the bottom. Bolts or screws used for fasteners must not touch any parts or wiring. Perform leakage tests on customized installations.
5. Caution customers against mounting a product on a sloping shelf or in a tilted position, unless the receiver is properly secured.
6. A product on a roll-about cart should be stable in its mounting to the cart. Caution the customer on the hazards of trying to roll a cart with small casters across thresholds or deep pile carpets.
7. Caution customers against using extension cords. Explain that a forest of extensions, sprouting from a single outlet, can lead to disastrous consequences to home and family.

SERVICING PRECAUTIONS

CAUTION: Before servicing the A/V products covered by this service data and its supplements and addends, read and follow the SAFETY PRECAUTIONS.
NOTE: if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publications, always follow the safety precautions.
Remember Safety First :

General Servicing Precautions

1. Always unplug the A/V products AC power cord from the AC power source before:
   (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
   (2) Disconnecting or reconnecting any internal electrical plug or other electrical connection.
   (3) Connecting a test substitute in parallel with an electrolytic capacitor.
   Caution : A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Do not spray chemicals on or near this A/V product or any of its assemblies.

3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cotton-tipped swab, or comparable soft applicator.
   Unless specified otherwise in this service data, lubrication of contacts is not required.

4. Do not defeat any plug/socket B+ voltage interlocks with whitch instruments covered by this service manual might be equipped.

5. Do not apply AC power to this A/V product and / or any of its electrical assemblies unless all solidstate device heat sinks are correctly installed.

6. Always connect the test instrument ground lead to an appropriate ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1Mohm.
Note 1 : Accessible Conductive Parts include Metal panels, Input terminals, Earphone jacks,etc.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor chip components.
The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate an electrical charge sufficient to damage ES devices.

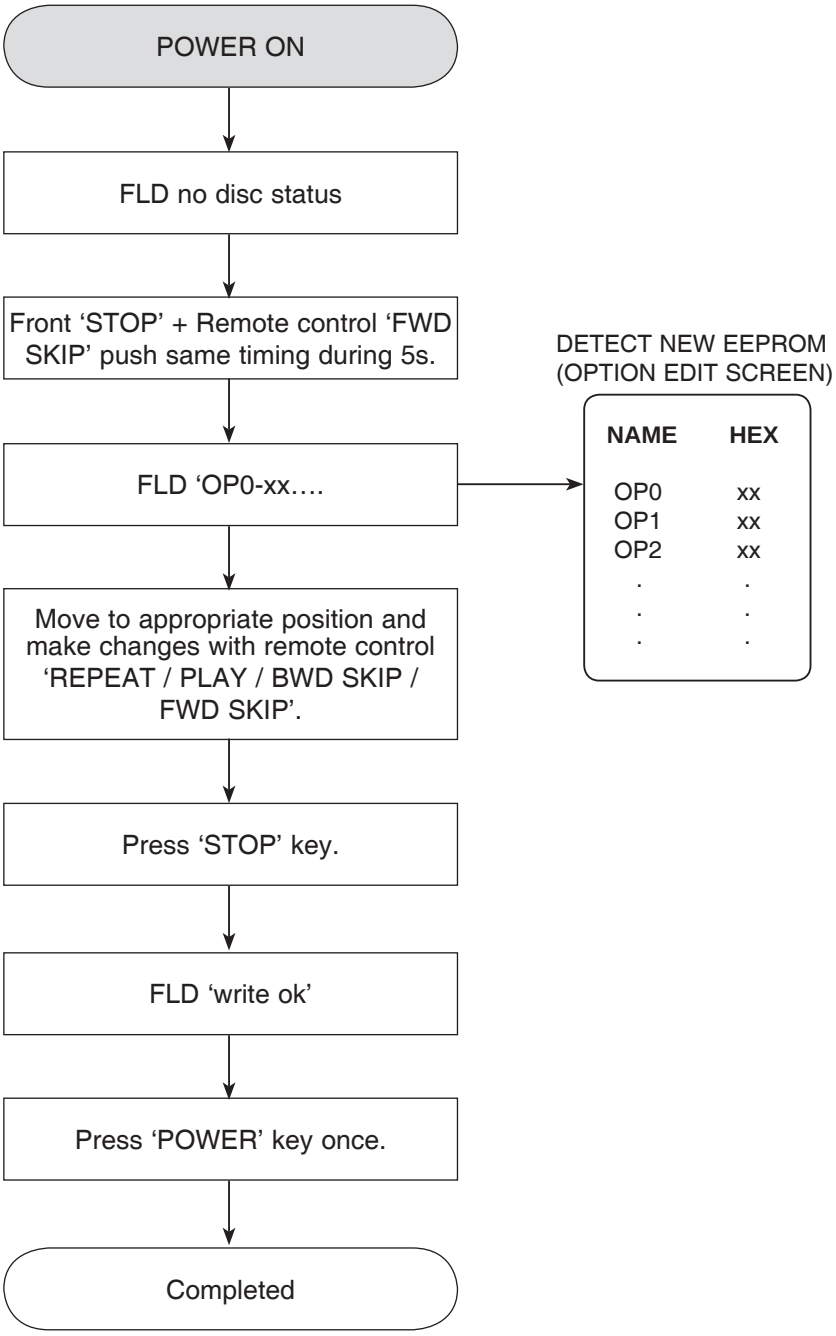
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil,or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Normally harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

SERVICE INFORMATION FOR EEPROM



PROGRAM UPDATE GUIDE

1. HOW TO UPDATE ESS PROGRAM

(1) Rename the file name to download as "**LG_(MODEL NAME)_(Vresion).ROM**" in upper cases.
ex) XA64 : "LG_XA64_0905180.ROM"
Refer to the Standard for naming of software.
(2) Copy the file to the formatted USB, and burn it.
(3) Move to the USB function, and insert the USB to the set.
The upgrade information will be shown on the screen.
(4) Remove the USB.
(5) Remove and reconnect the power cable when it changes to logo screen from upgrade information.
Then the upgrade process is completed.

2. HOW TO UPDATE SANYO PROGRAM

(1) Change the file name to download as "**(MODEL NAME)_(Version).HEX**". in upper cases
ex) XA64: XA64_0809262.HEX
(2) Copy the file to the root folder of USB storage.
(3) Put the USB into the set.
Then the upgrade process will be started with the upgrade information.
(4) If the upgrade process is complete, the set will be rebooted with "Complete" message.

3. HOW TO UPDATE MCS PROGRAM

(1) Change the file name to download as "(MODEL NAME)_(Option)_(Version).MCS".
ex) XA64_01010_07.HEX
(2) Copy the file to the root folder of USB storage.
(3) Put the USB into the set.
Then the upgrade process will be started with the upgrade information.
(4) If the upgrade process is complete, the set will be rebooted with "SUCCESS" message.

SPECIFICATIONS

• GENERAL

Power supply	200 ~ 240 V, 50/60 Hz
Power consumption	50 W
Net Weight	2.71 kg
External dimensions (W x H x D)	170 x 240 x 253 (mm)
Operating temperature	5°C ~ 35°C
Operating humidity	5 % ~ 85 %

• TUNER

FM Tuning Range	87.5 ~ 108.0 MHz
AM Tuning Range	522 ~ 1,620 KHz

• AMPLIFIER

Output Power	30 W + 30 W
T.H.D	0.5 %
Frequency Response	50 Hz ~ 20 KHz
Signal-to-noise ratio	70 dB

• CD

Frequency response	100 Hz ~ 18 KHz
Signal-to-noise ratio	70 dB
Dynamic range	55 dB

• SPEAKERS

Type	2 Way 2 Speaker
impedance	6 Ω
Rated Input Power	30 W
Max. Input Power	60 W
Net Dimensions (W x H x D)	150 x 243 x 180 (mm)
Net Weight	2.08 kg

Note : Design and specifications are subject to change prior notice.

MEMO

SECTION 2

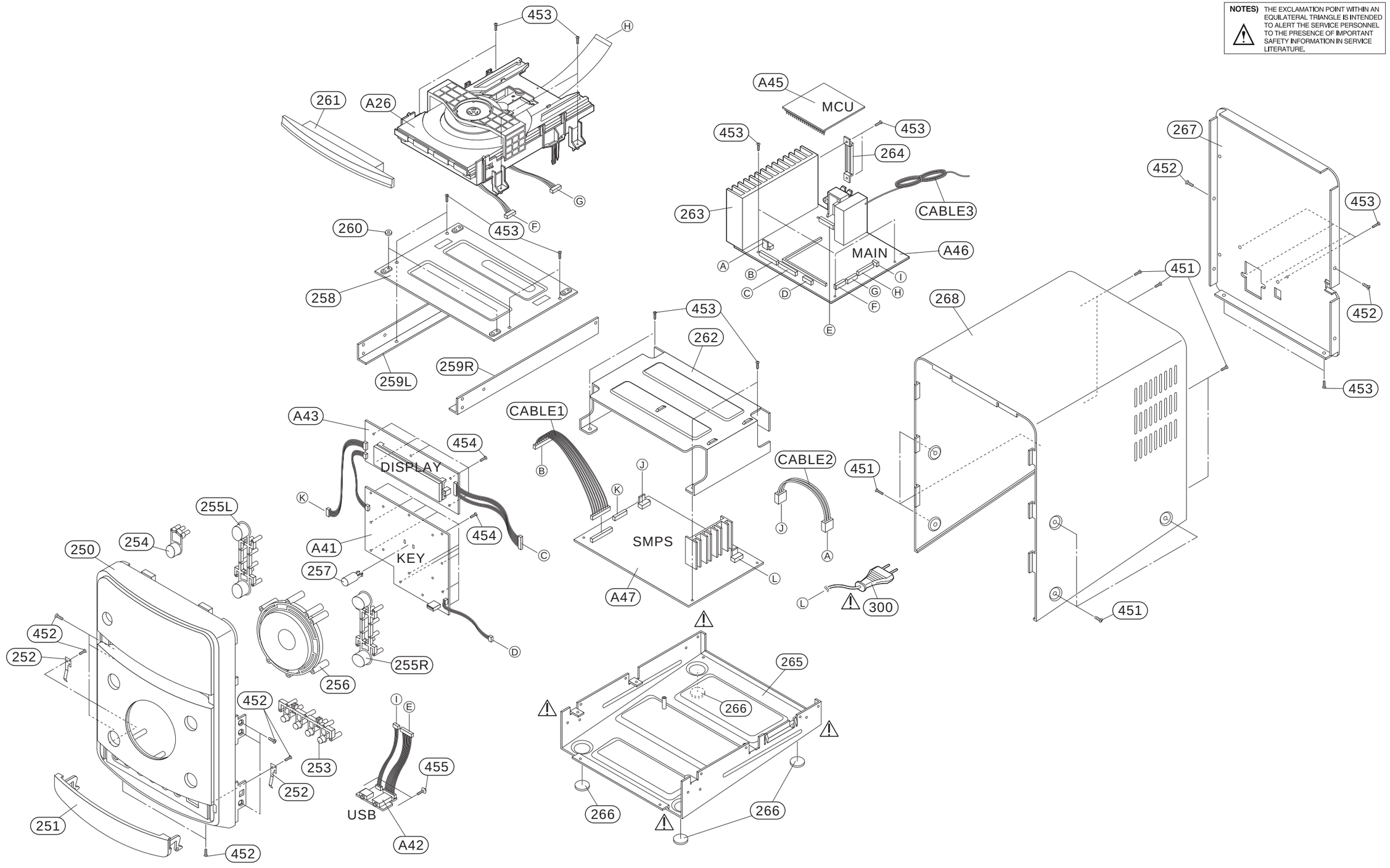
CABINET & MAIN CHASSIS

CONTENTS

MEMO

EXPLODED VIEWS
1. CABINET AND MAIN FRAME SECTION

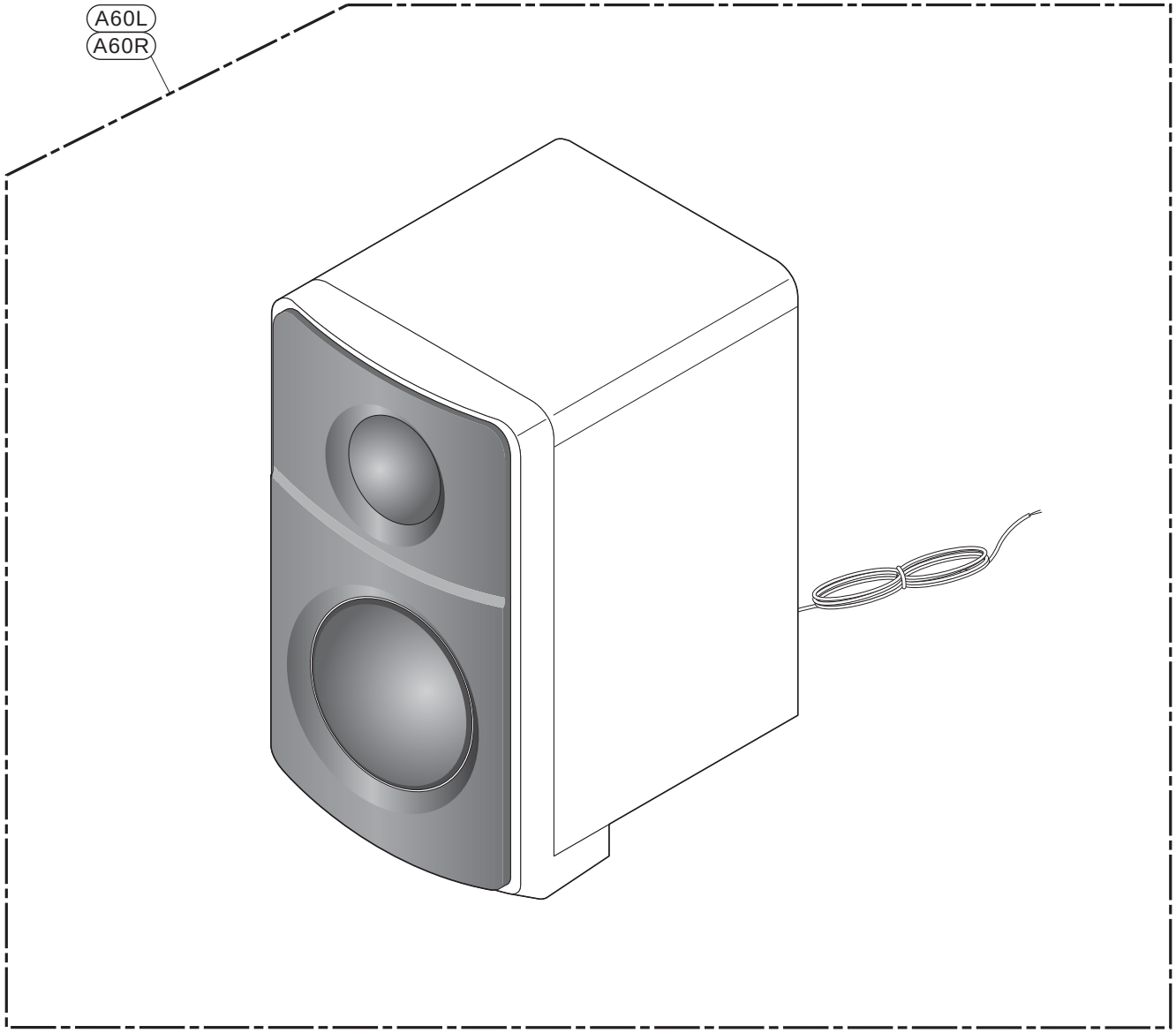
NOTES) THE EXCLAMATION POINT WITHIN AN EQUILATERAL TRIANGLE IS INTENDED TO ALERT THE SERVICE PERSONNEL TO THE PRESENCE OF IMPORTANT SAFETY INFORMATION IN SERVICE LITERATURE.



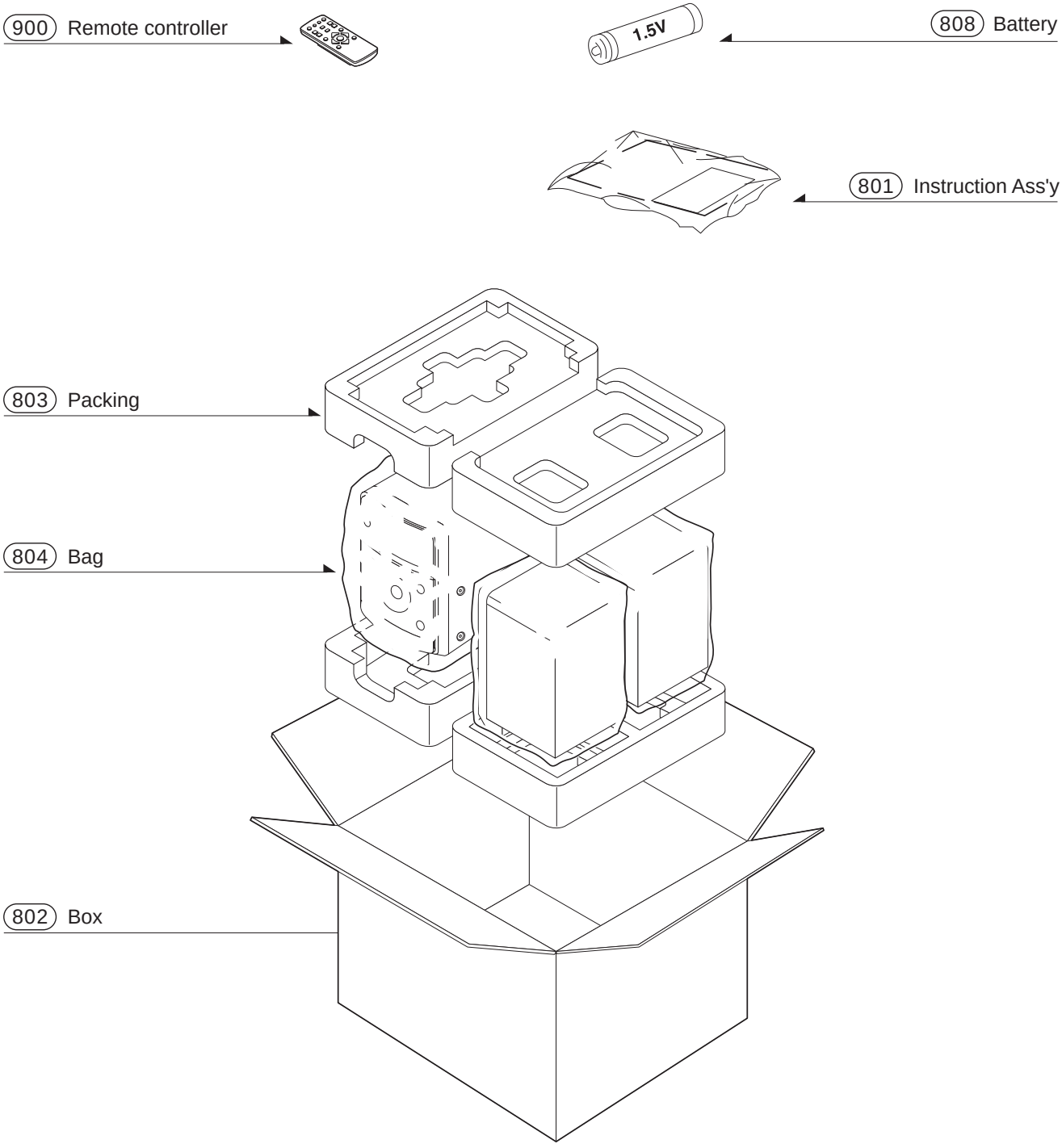
MEMO

MEMO

2. SPEAKER SECTION



3. PACKING ACCESSORY SECTION



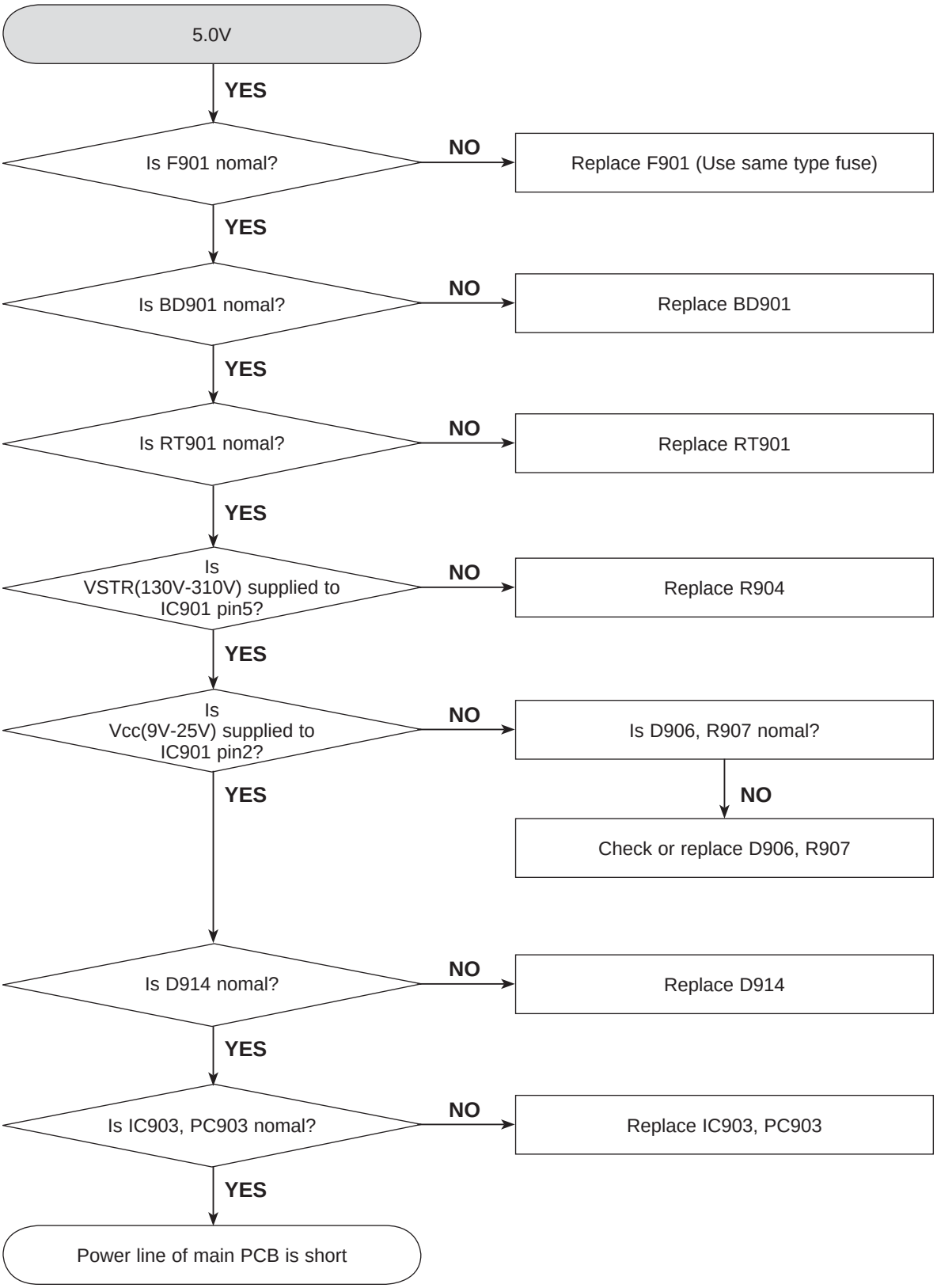
SECTION 3

ELECTRICAL

CONTENTS

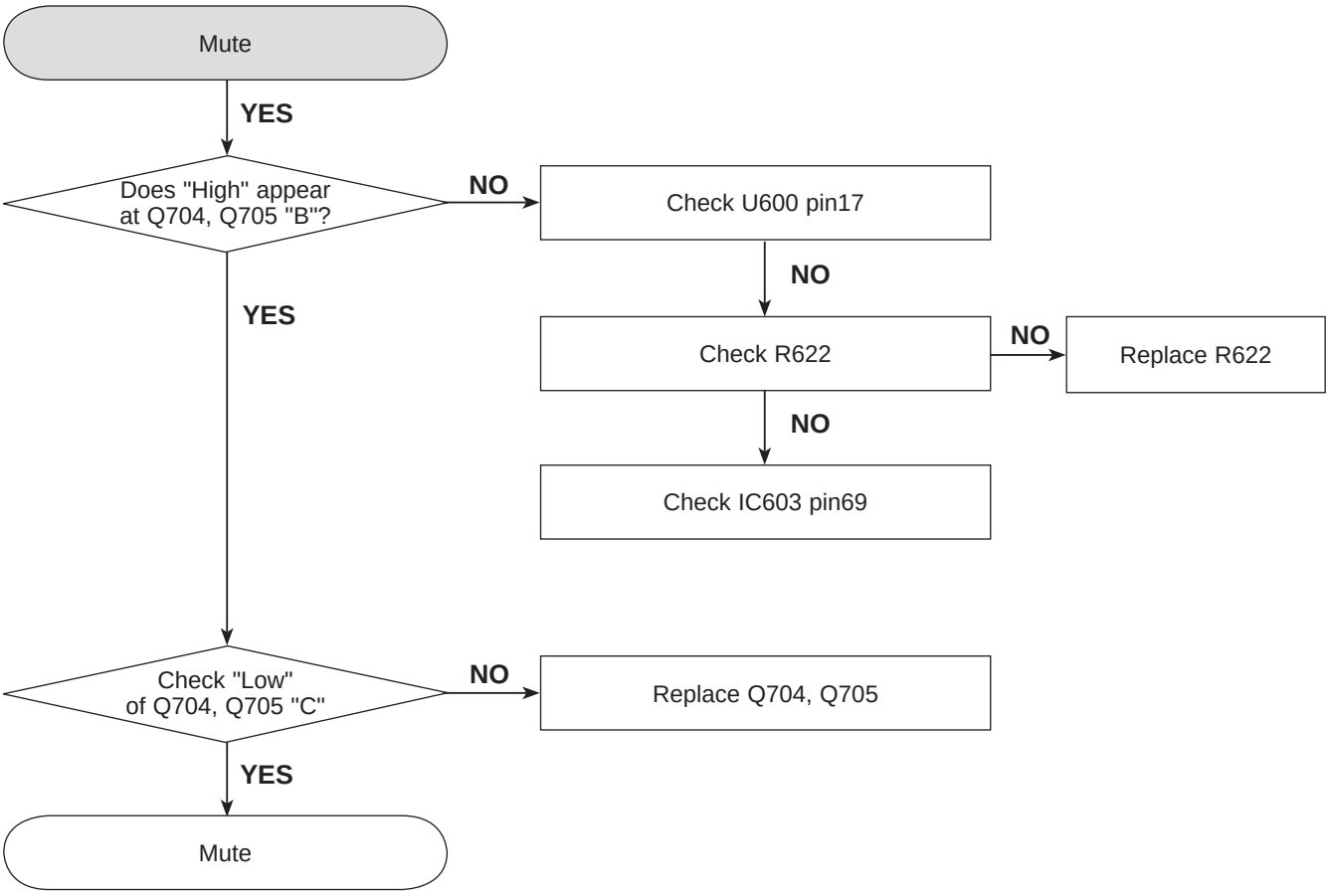
ELECTRICAL TROUBLESHOOTING GUIDE

1. SMPS PART



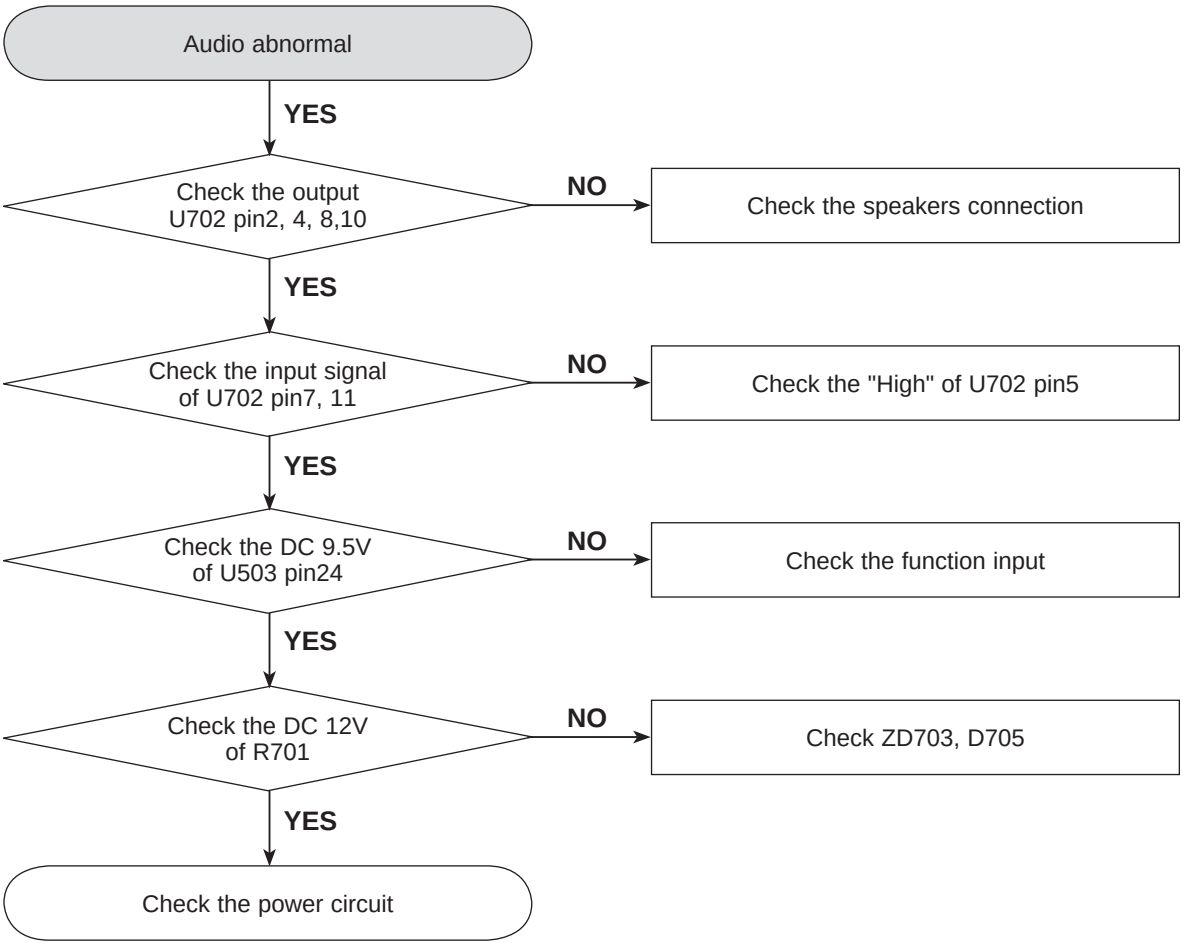
ELECTRICAL TROUBLESHOOTING GUIDE

2. MUTE



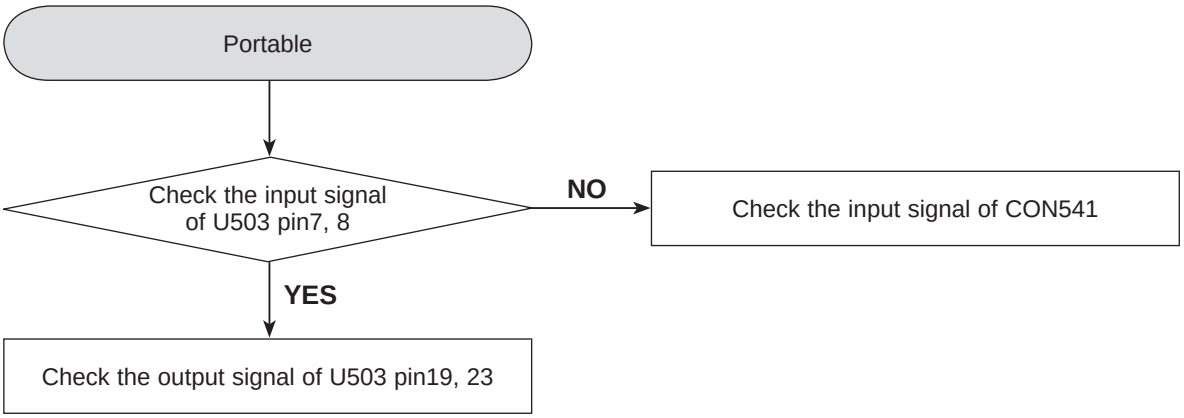
ELECTRICAL TROUBLESHOOTING GUIDE

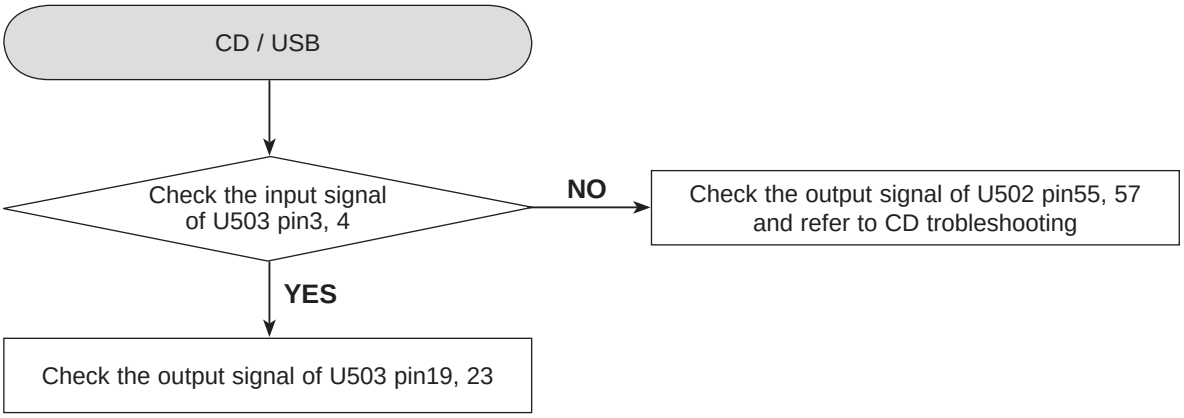
3. AUDIO ABNORMAL

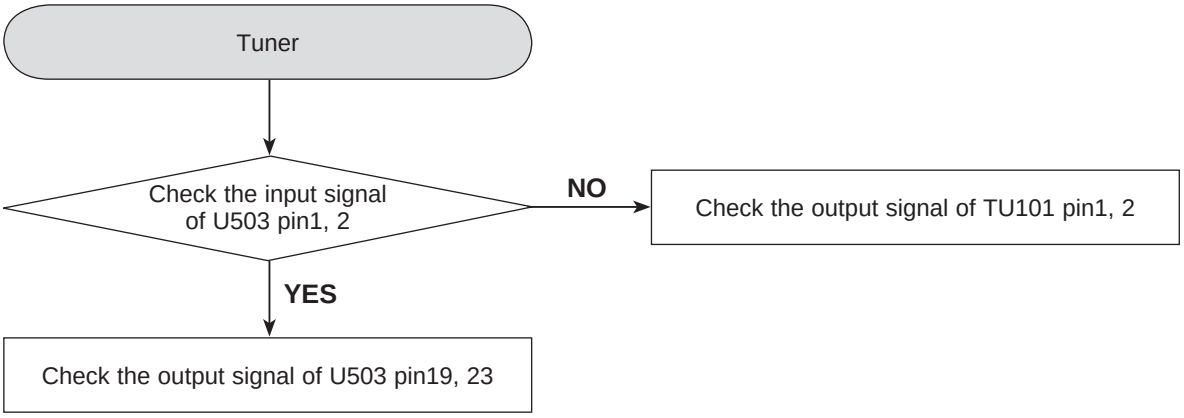


ELECTRICAL TROUBLESHOOTING GUIDE

4. AUDIO FUNCTION MODE

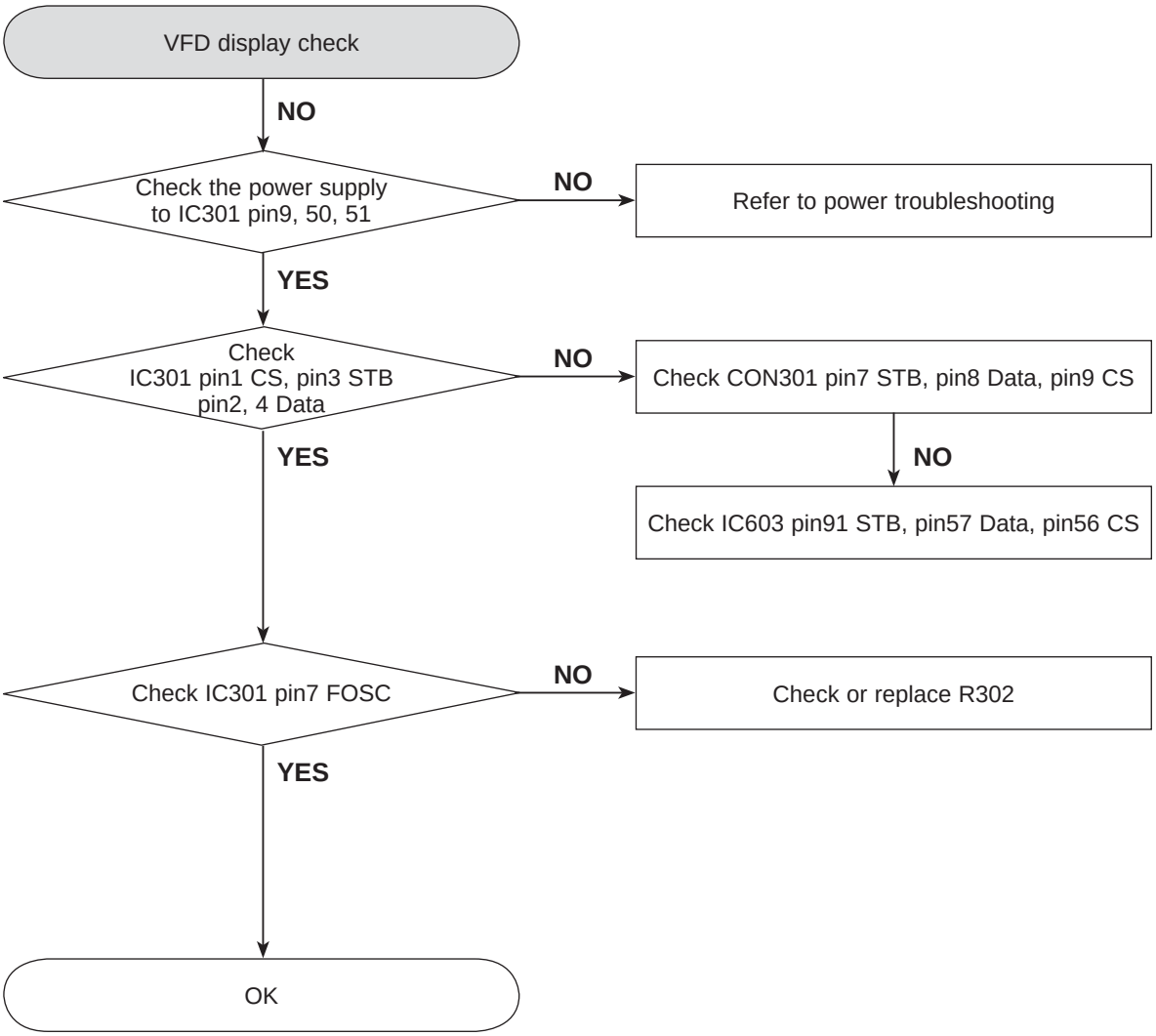






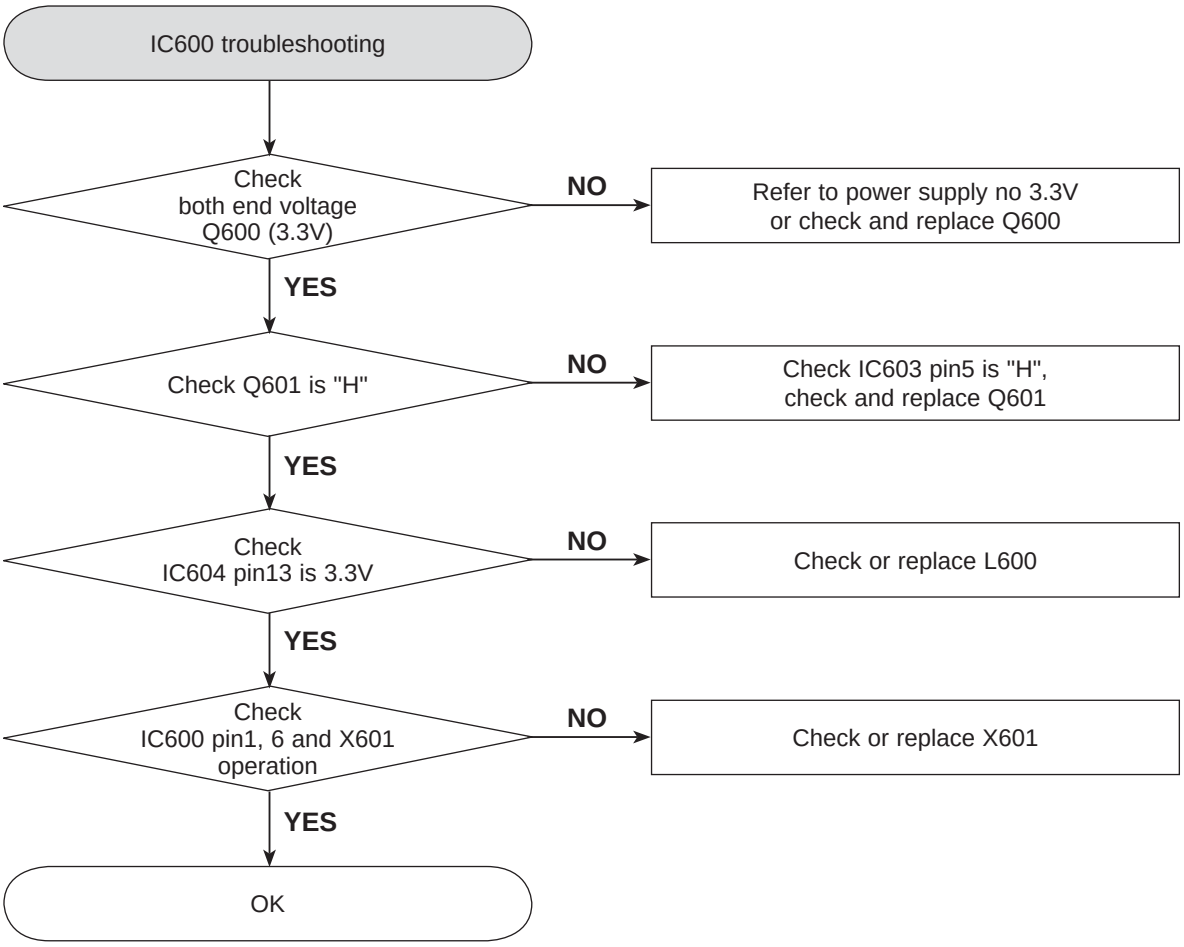
ELECTRICAL TROUBLESHOOTING GUIDE

5. IC301 TROUBLESHOOTING



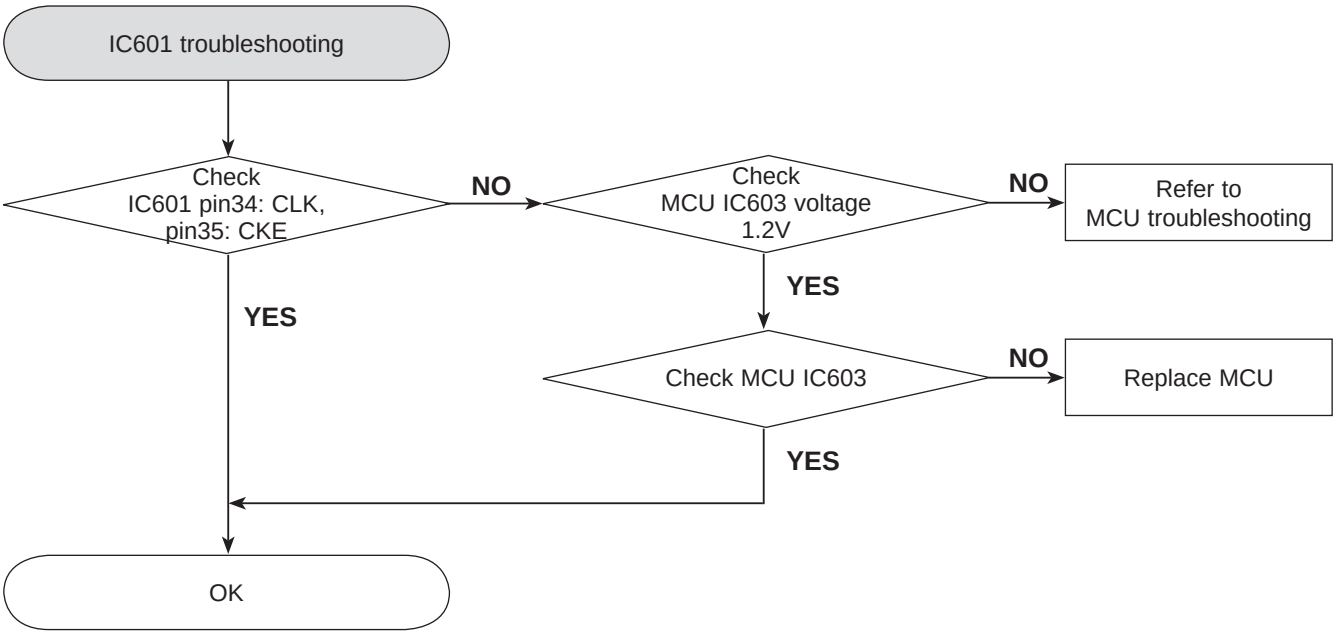
ELECTRICAL TROUBLESHOOTING GUIDE

6. IC600 TROUBLESHOOTING

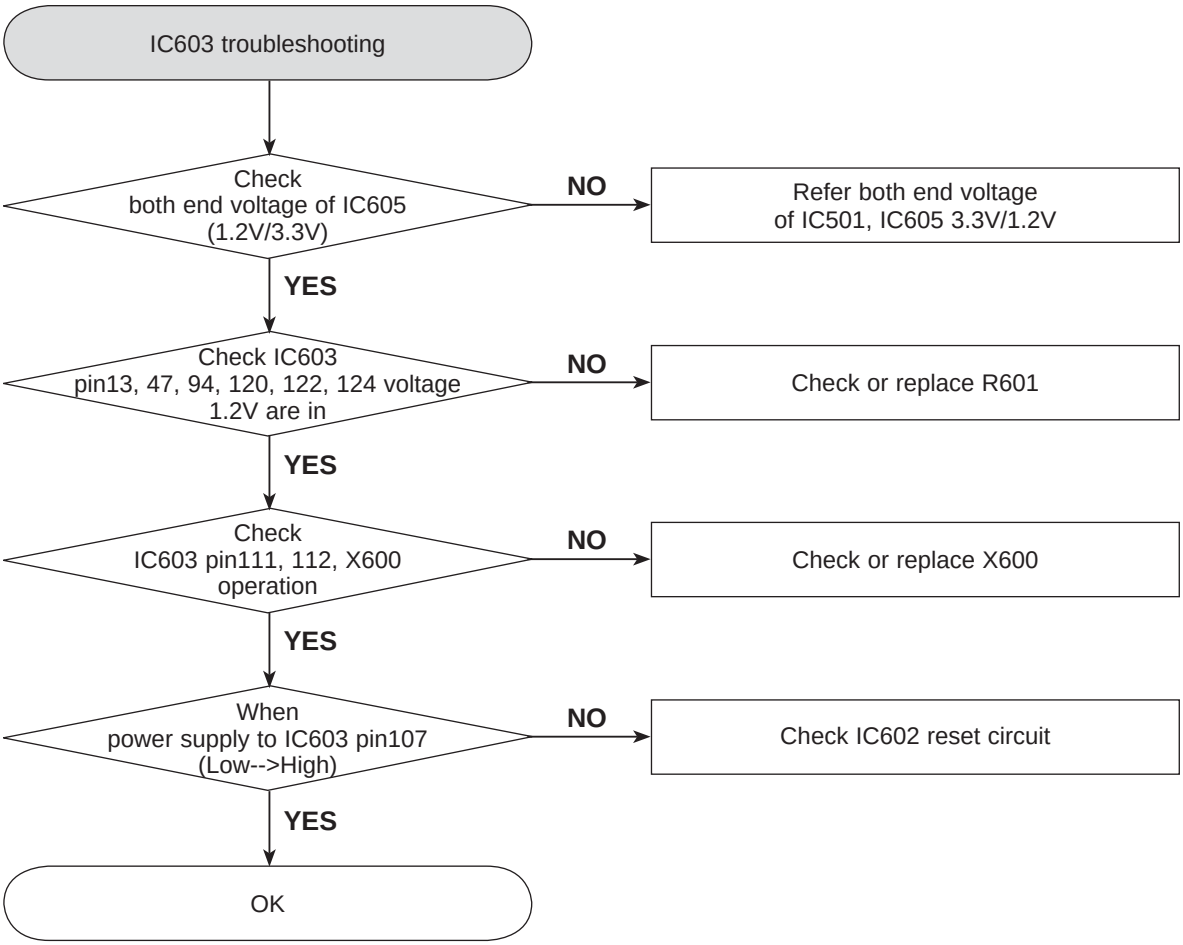


ELECTRICAL TROUBLESHOOTING GUIDE

7. IC601 TROUBLESHOOTING

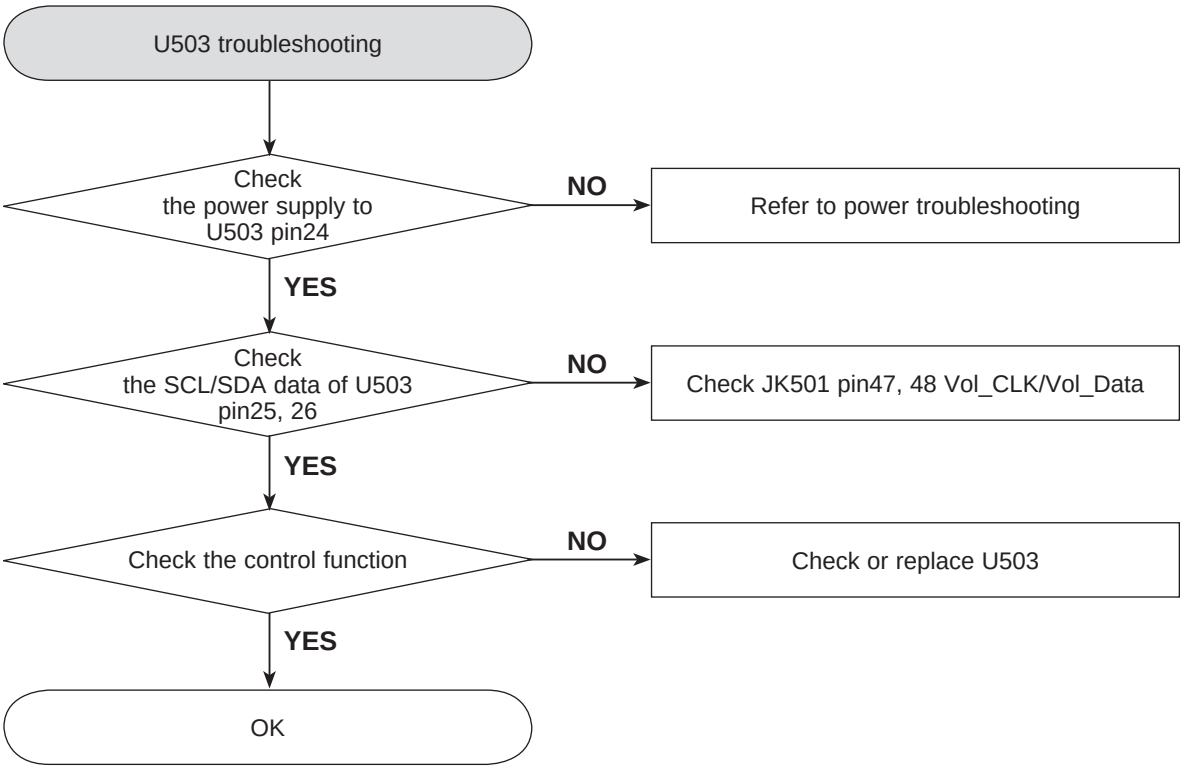


8. IC603 TROUBLESHOOTING

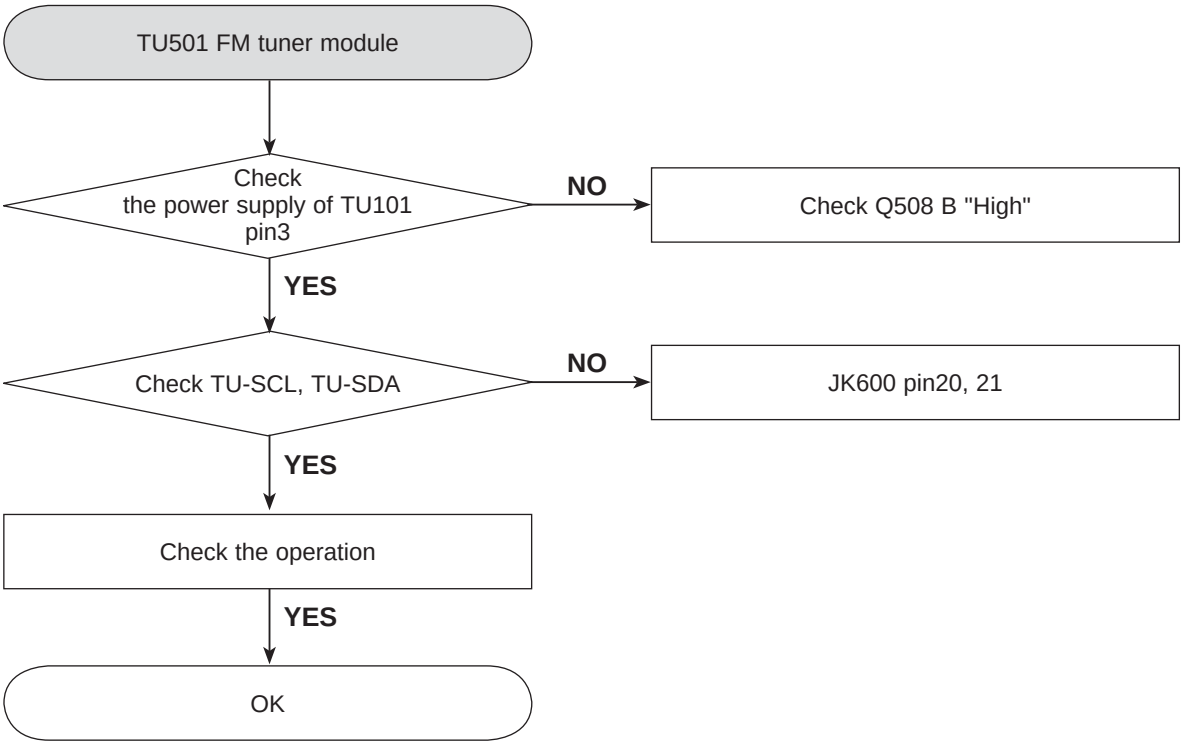


ELECTRICAL TROUBLESHOOTING GUIDE

9. U503 TROUBLESHOOTING

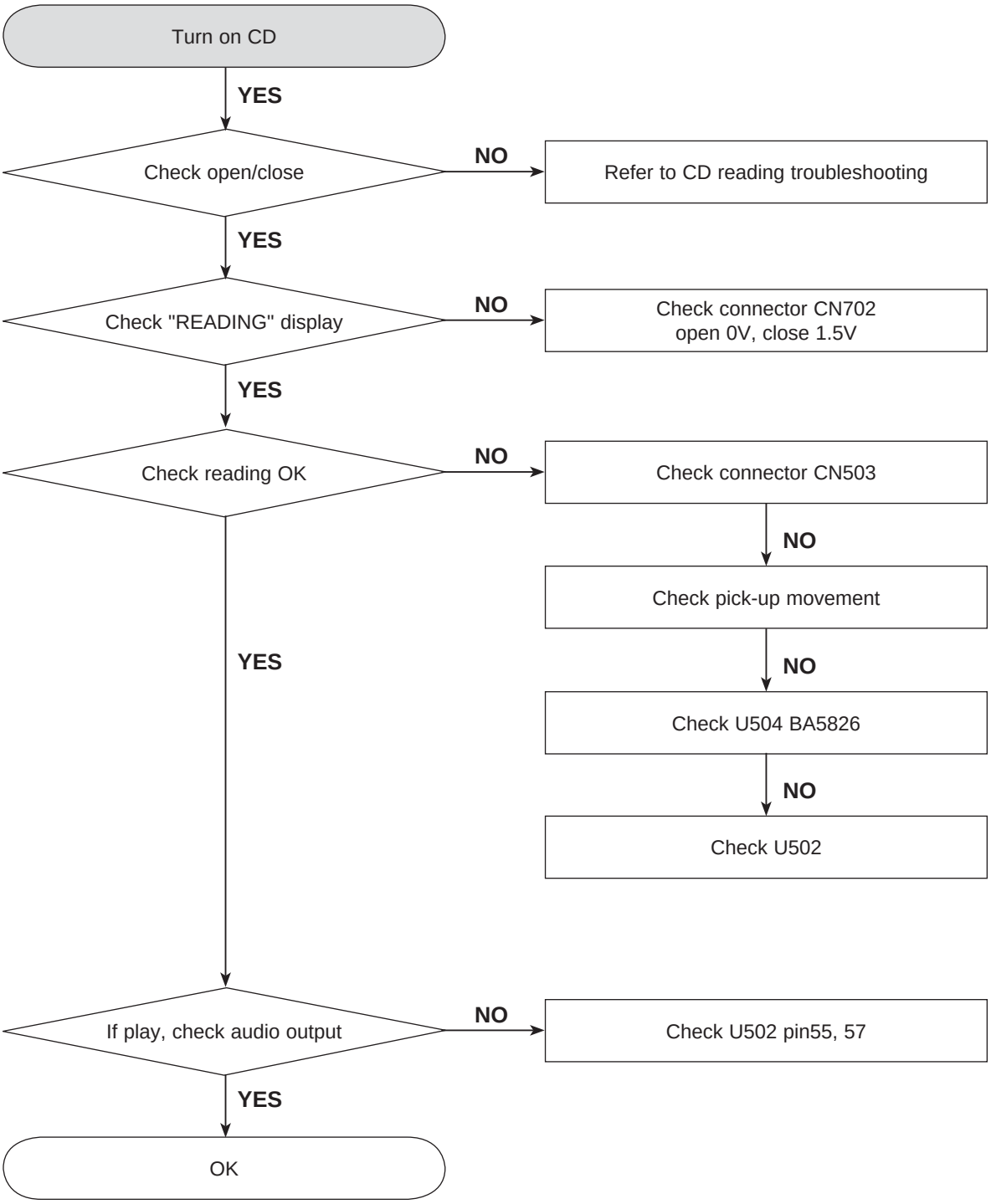


10. TU501 FM TUNER MODULE



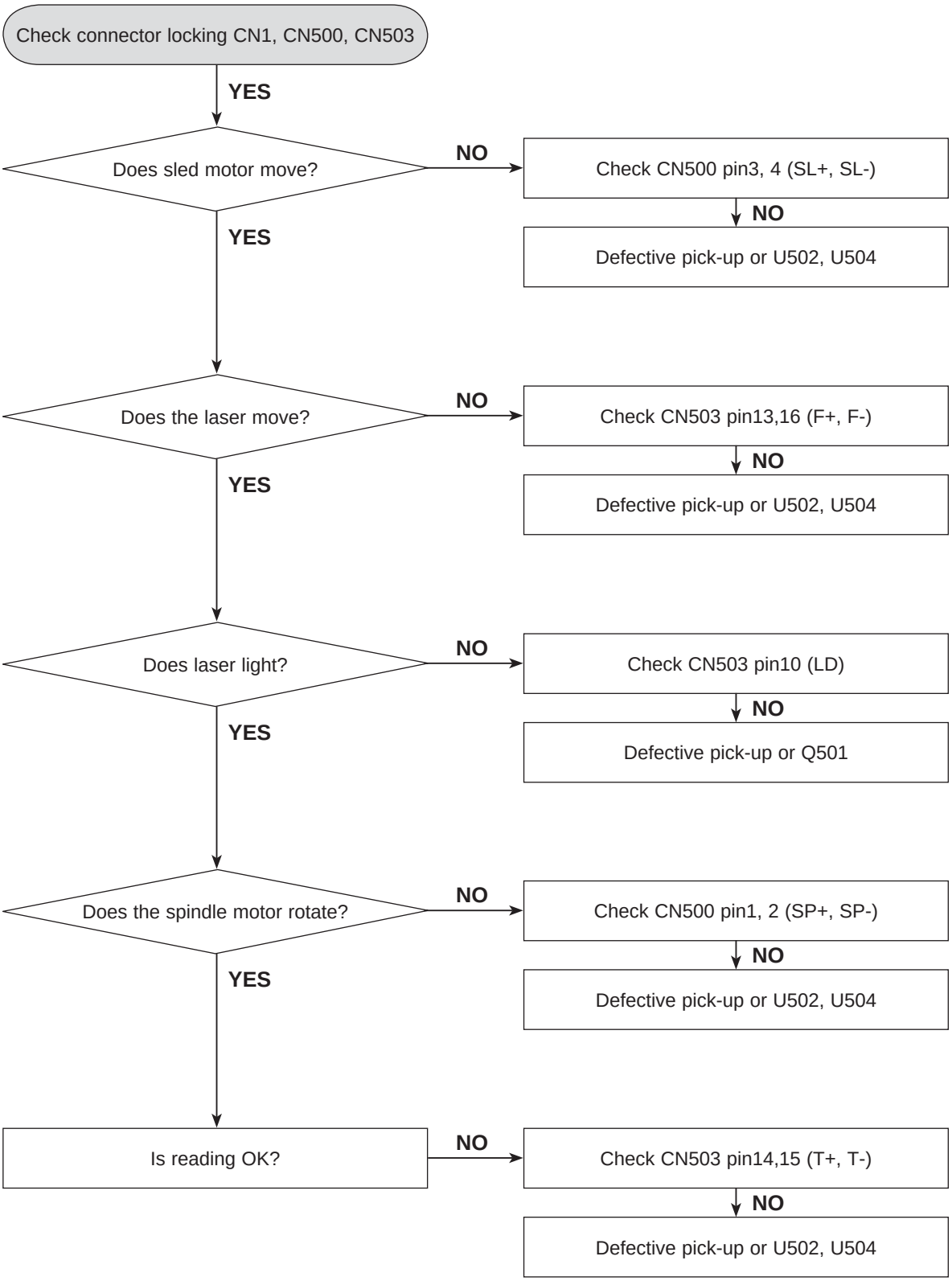
ELECTRICAL TROUBLESHOOTING GUIDE

11. CD PART



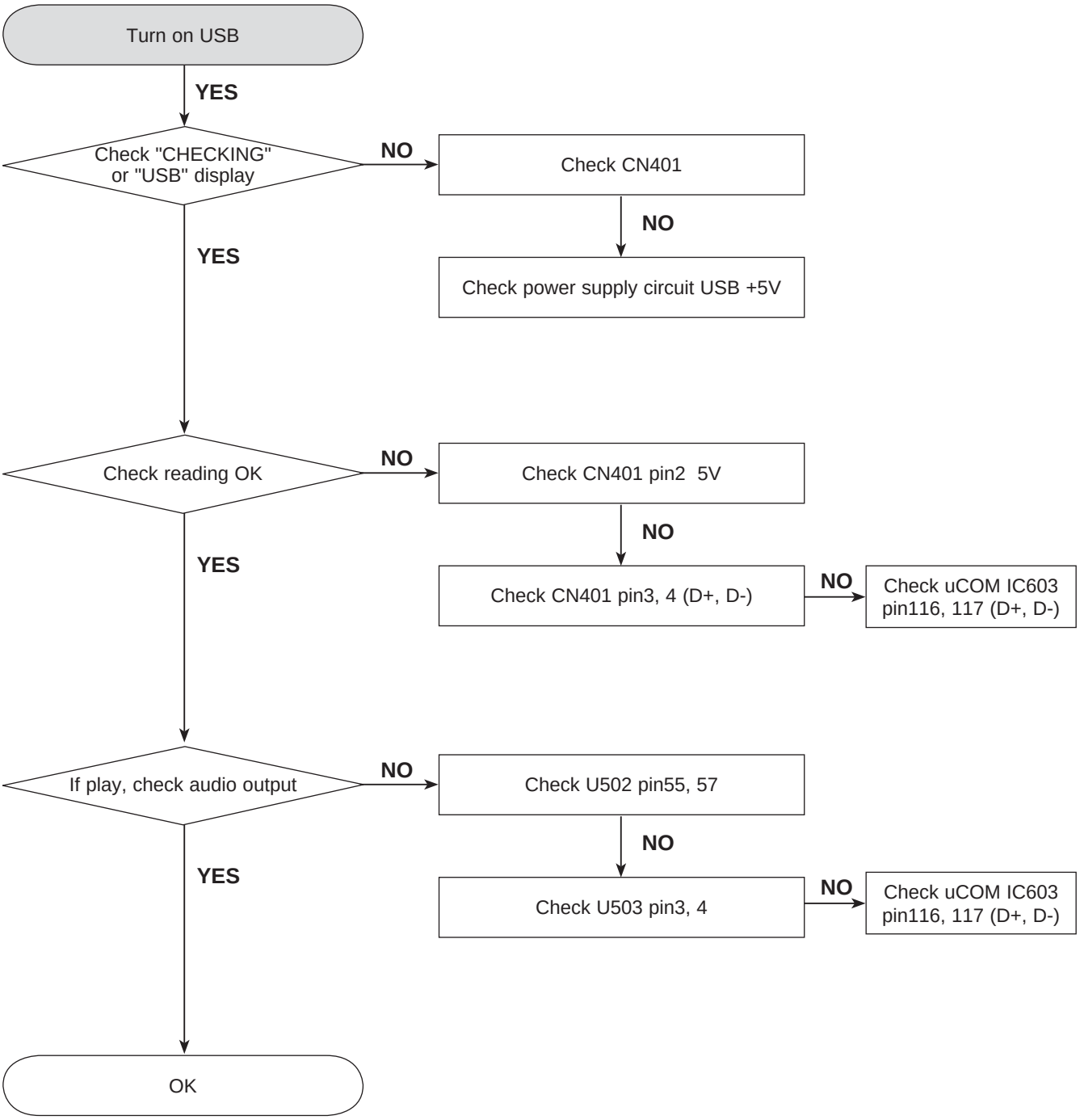
ELECTRICAL TROUBLESHOOTING GUIDE

12. CD READING CHECK



ELECTRICAL TROUBLESHOOTING GUIDE

13. USB PART



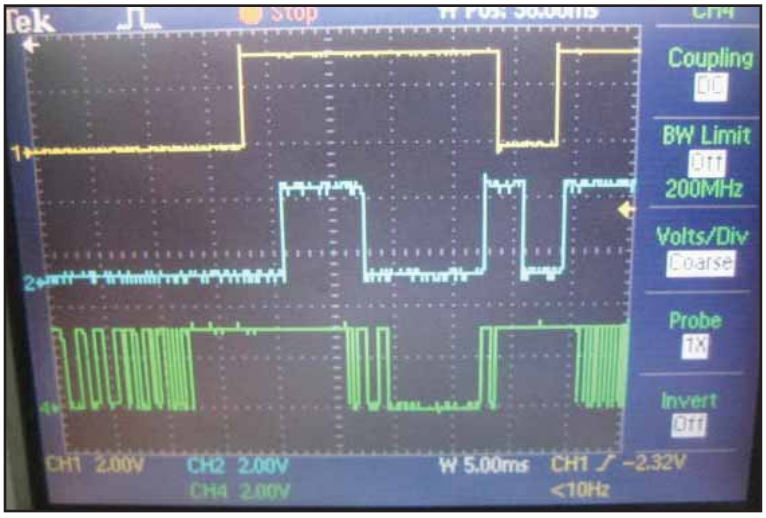
WAVEFORMS

1. CD SEARCHING WAVEFORM

U502 PIN61 EE 1

U502 PIN62 TE 2

U502 PIN60 FE 3



2. SPINDLE DRIVE & MOTOR WAVEFORM

U504 PIN27 SL- 4

U504 PIN26 SL+ 5

U504 PIN1 SP- 6

U504 PIN2 SP+ 7

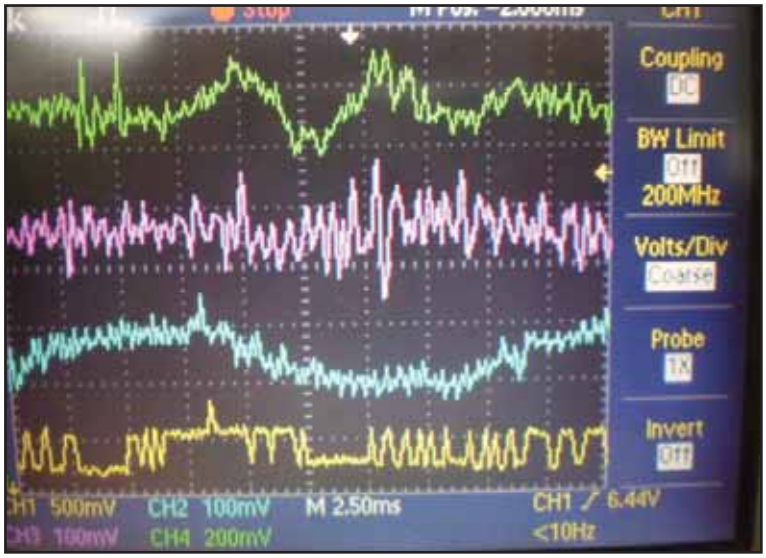
3. CD PLAYING WAVEFORM

U502 PIN62 TE 8

U502 PIN61 EE 9

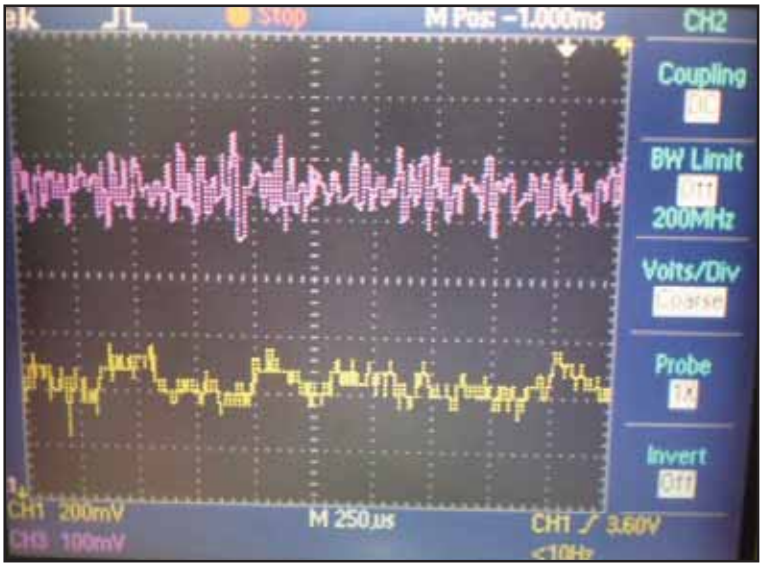
U502 PIN60 FE 10

U504 PIN2 SP+ 11



U502 PIN14 TD 12

U502 PIN13 FD 13



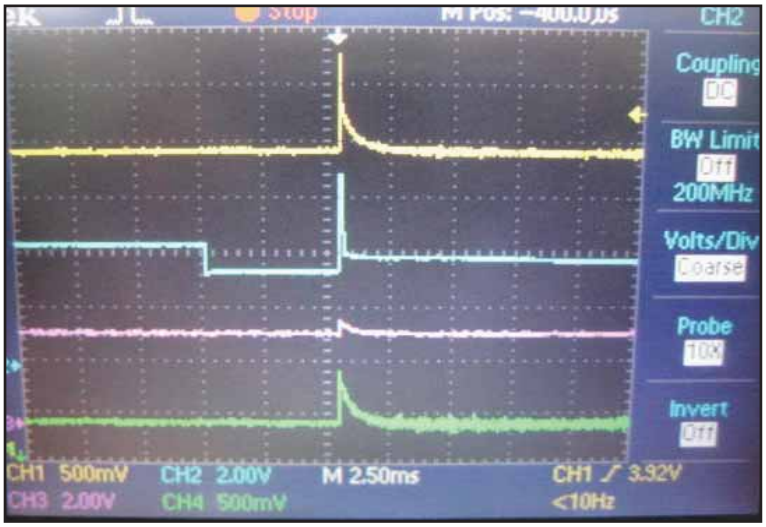
4. CD STOP ACTION WAVEFORM

U504 PIN2 SP+ 14

U504 PIN26 SLE+ 15

U504 PIN11 T+ 16

U504 PIN18 F+ 17



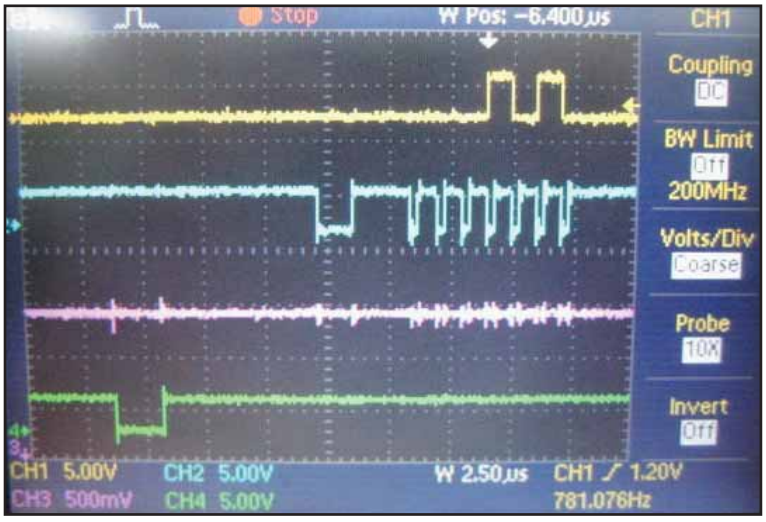
5. CD READING WAVEFORM

U502 PIN41 MCK 18

U502 PIN19 DIN 19

U502 PIN20 R/W 20

U502 PIN21 BUSY 21

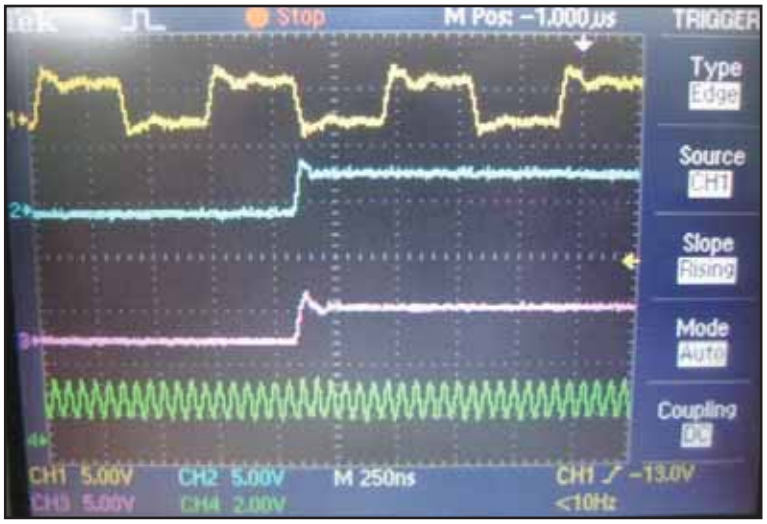


U502 PIN39 LRCK 22

U502 PIN40 BCK 23

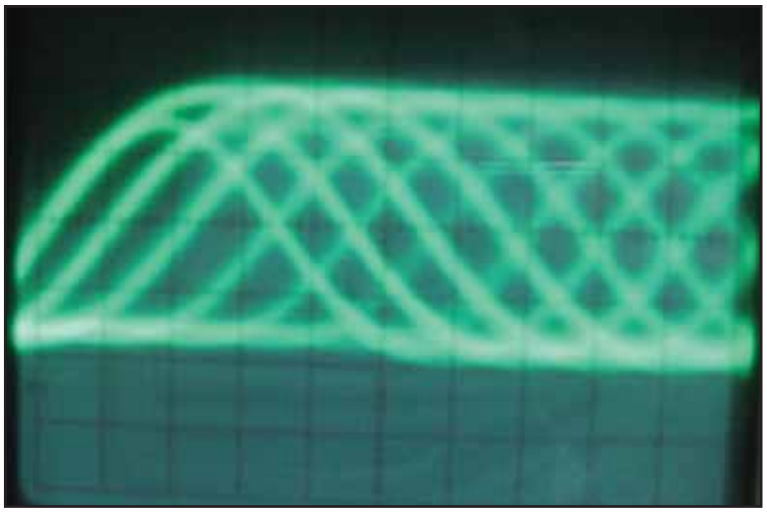
U502 PIN41 MCK 24

U502 PIN38 DATA 25



6. CD PLAYING RF WAVEFORM

U502 PIN63 RF 26

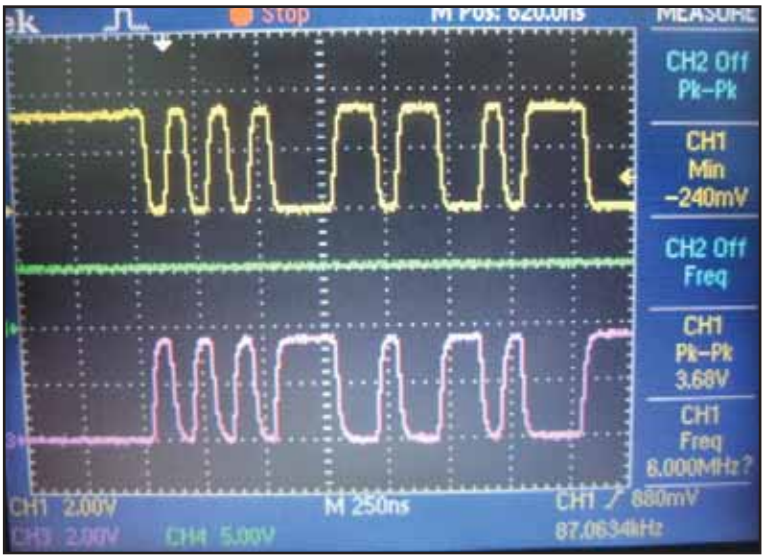


7. USB OPERATING WAVEFORM

CON4 PIN2 D- 27

CON4 PIN1 +5V 28

CON4 PIN3 D+ 29

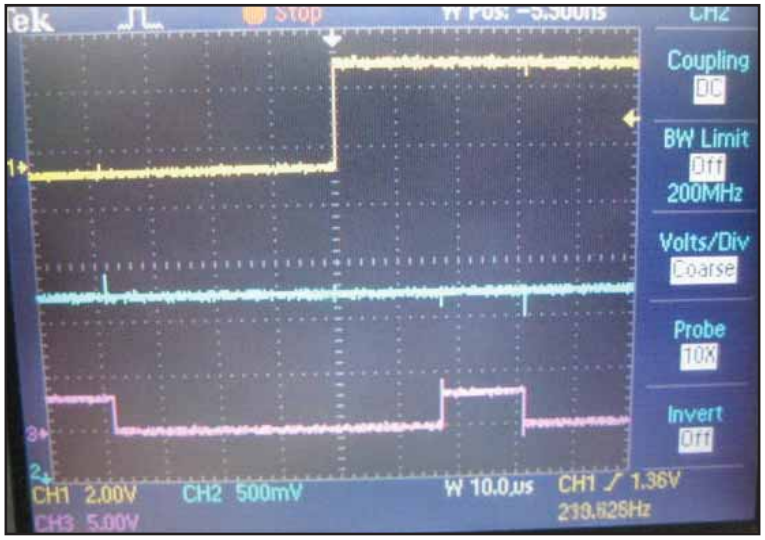


8. RADIO OPERATING WAVEFORM

U701 PIN2 DA 30

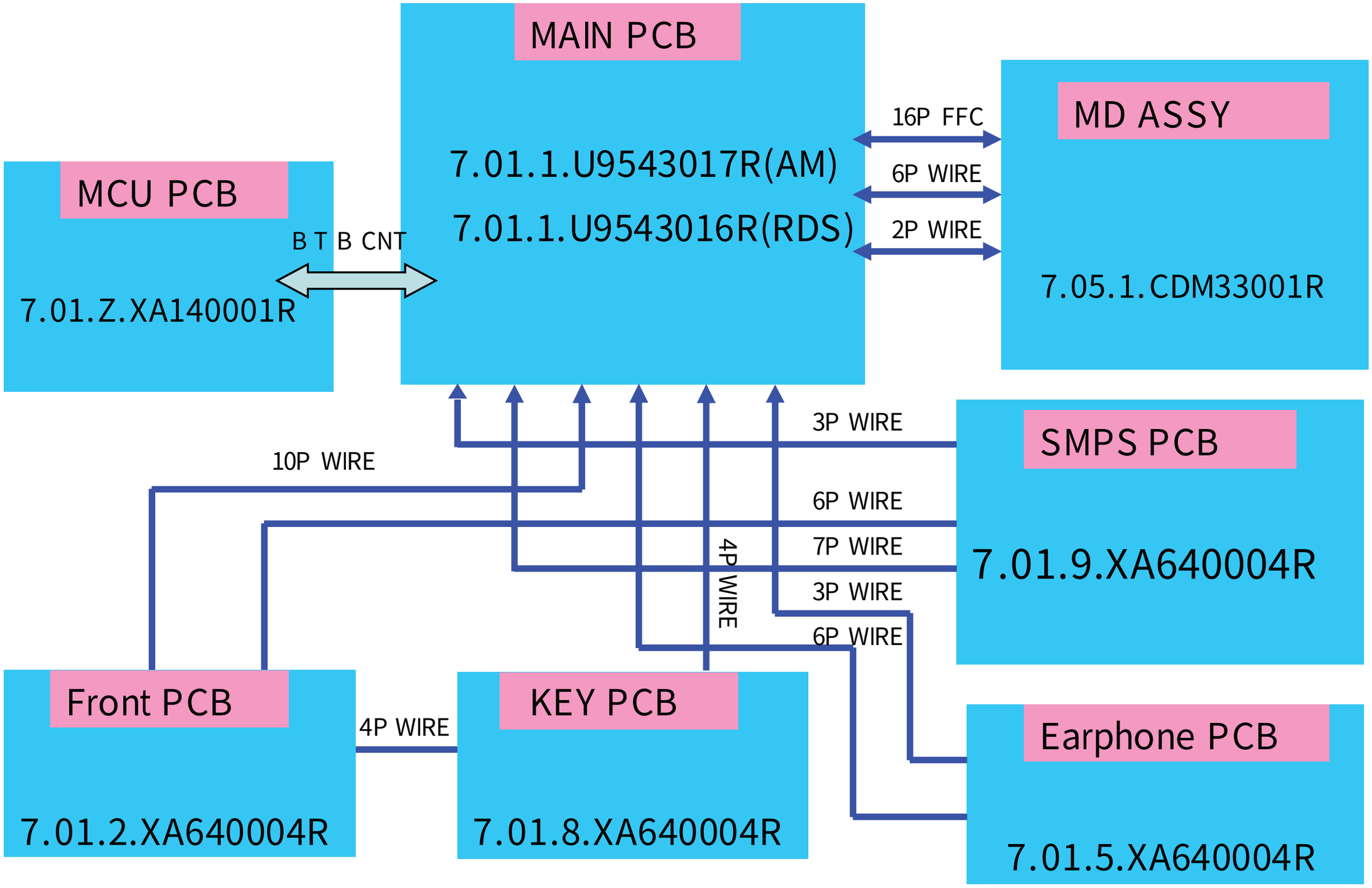
U701 PIN8 RST 31

U701 PIN1 SCK 32

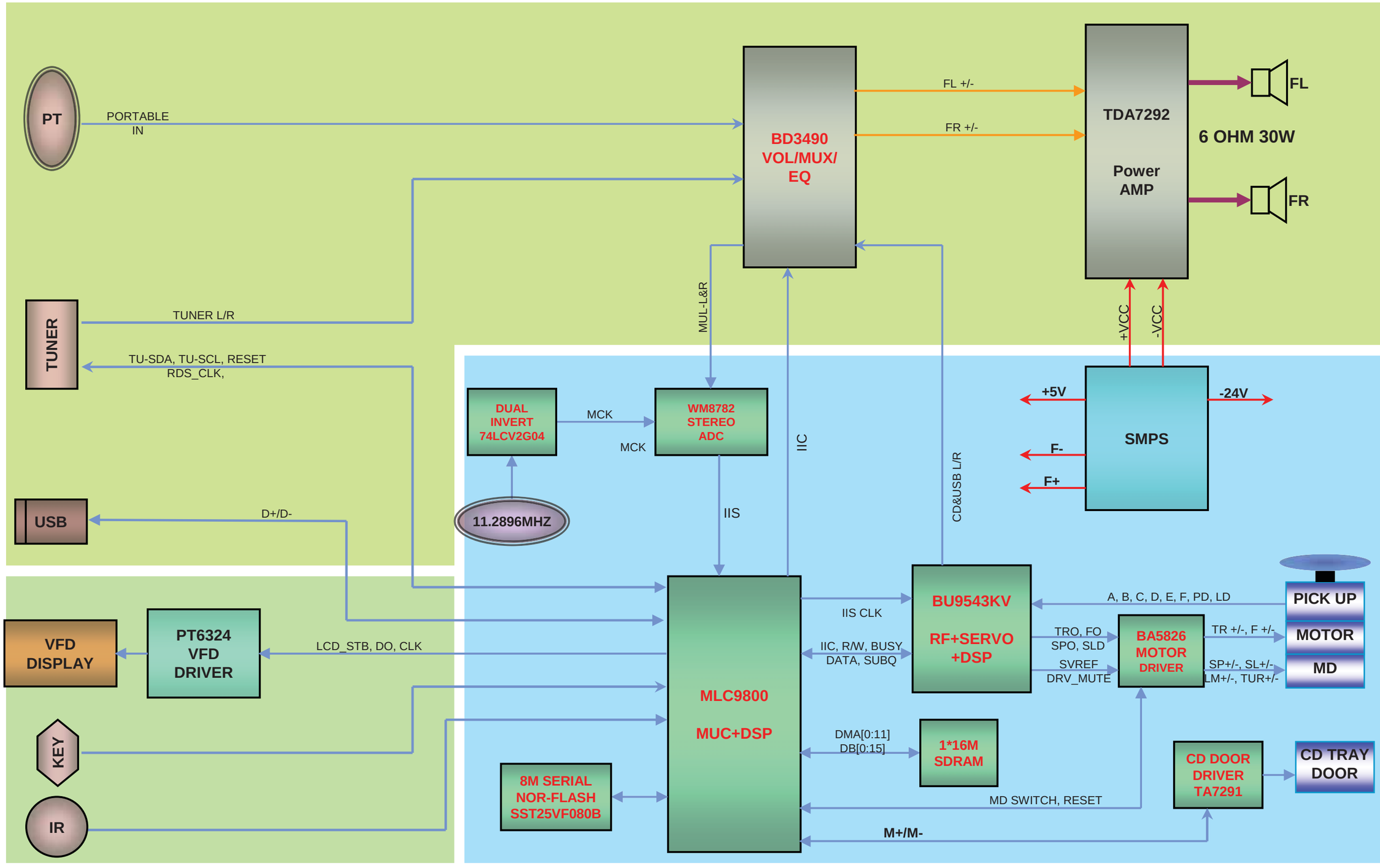


MEMO

WIRING DIAGRAM



BLOCK DIAGRAM



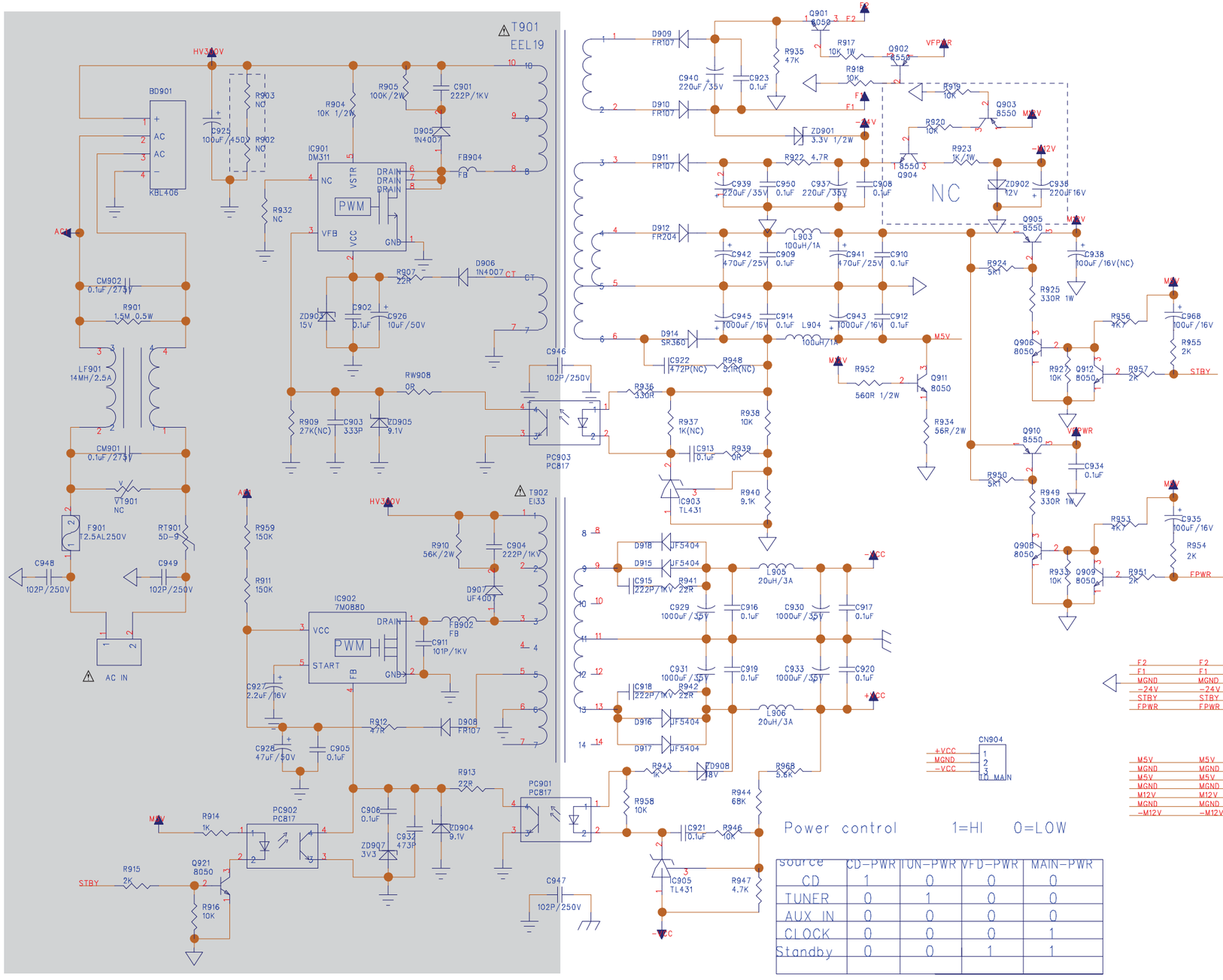
CIRCUIT DIAGRAMS
1. SMPS CIRCUIT DIAGRAM

IMPORTANT SAFETY

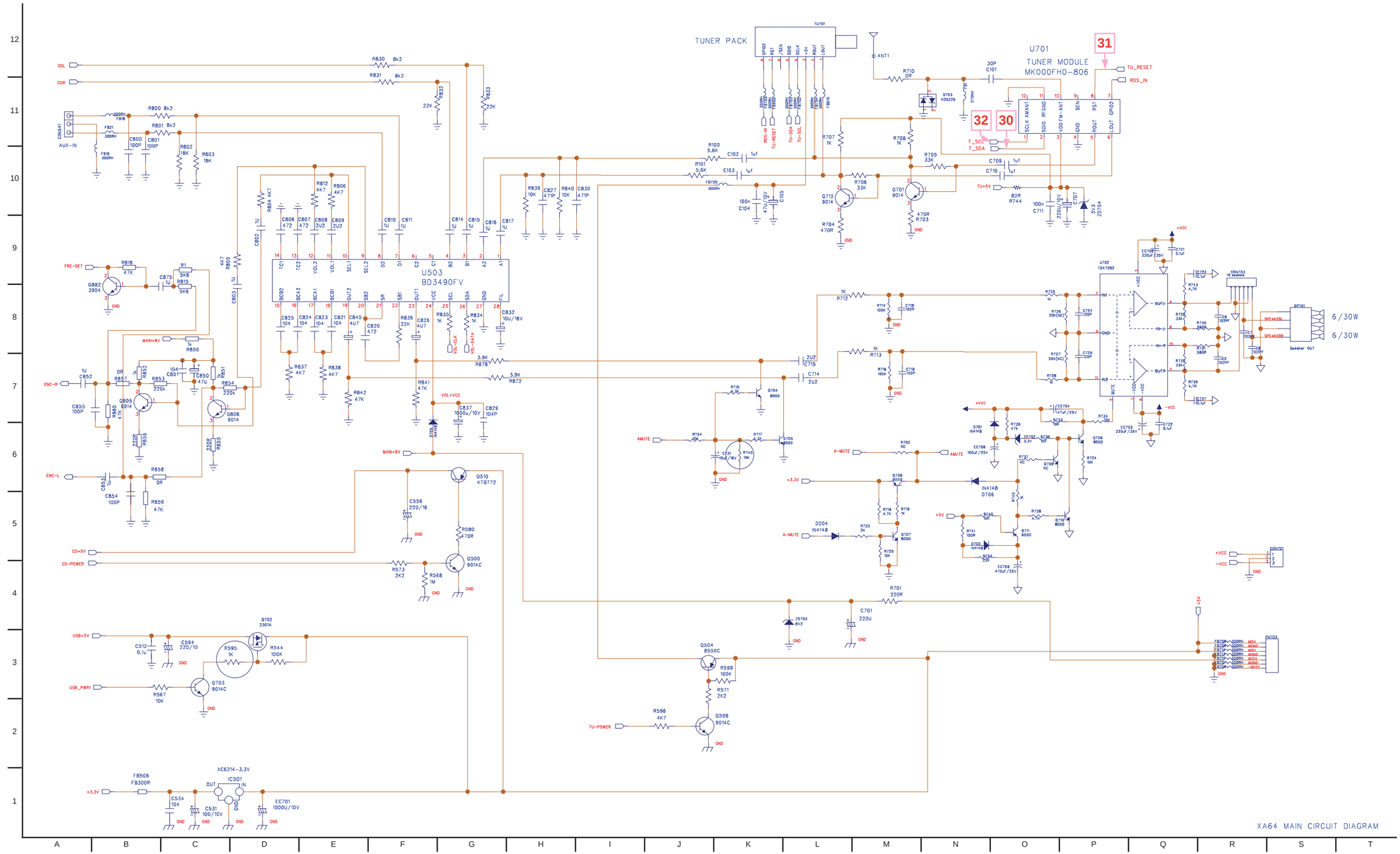
WHEN SERVICING THIS CHASSIS, UNDER NO CIRCUMSTANCES SHOULD THE ORIGINAL DESIGN BE MODIFIED OR ALTERED WITHOUT PERMISSION FROM THE LG CORPORATION. ALL COMPONENTS SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL CIRCUIT. SPECIAL COMPONENTS ARE SHADED ON THE SCHEMATIC FOR EASY IDENTIFICATION. THIS CIRCUIT DIAGRAM MAY OCCASIONALLY DIFFER FROM THE ACTUAL CIRCUIT USED. THIS WAY, IMPLEMENTATION OF THE LATEST SAFETY AND PERFORMANCE IMPROVEMENT CHANGES INTO THE SET IS NOT DELAYED UNTIL THE NEW SERVICE LITERATURE IS PRINTED.

NOTE :

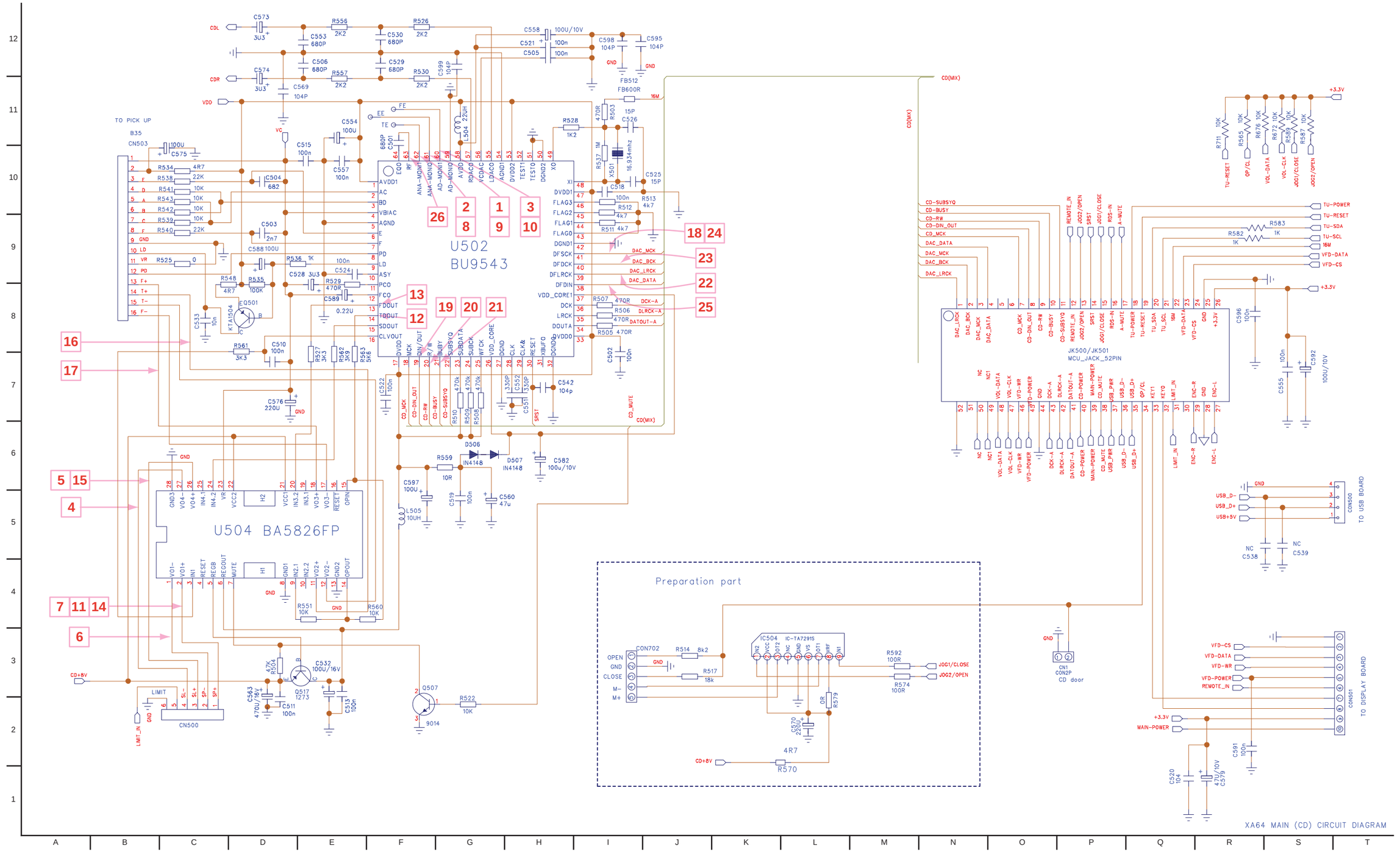
1. Shaded(▩) parts are critical for safety. Replace only with specified part number.
2. Voltages are DC-measured with a digital voltmeter during Play mode.



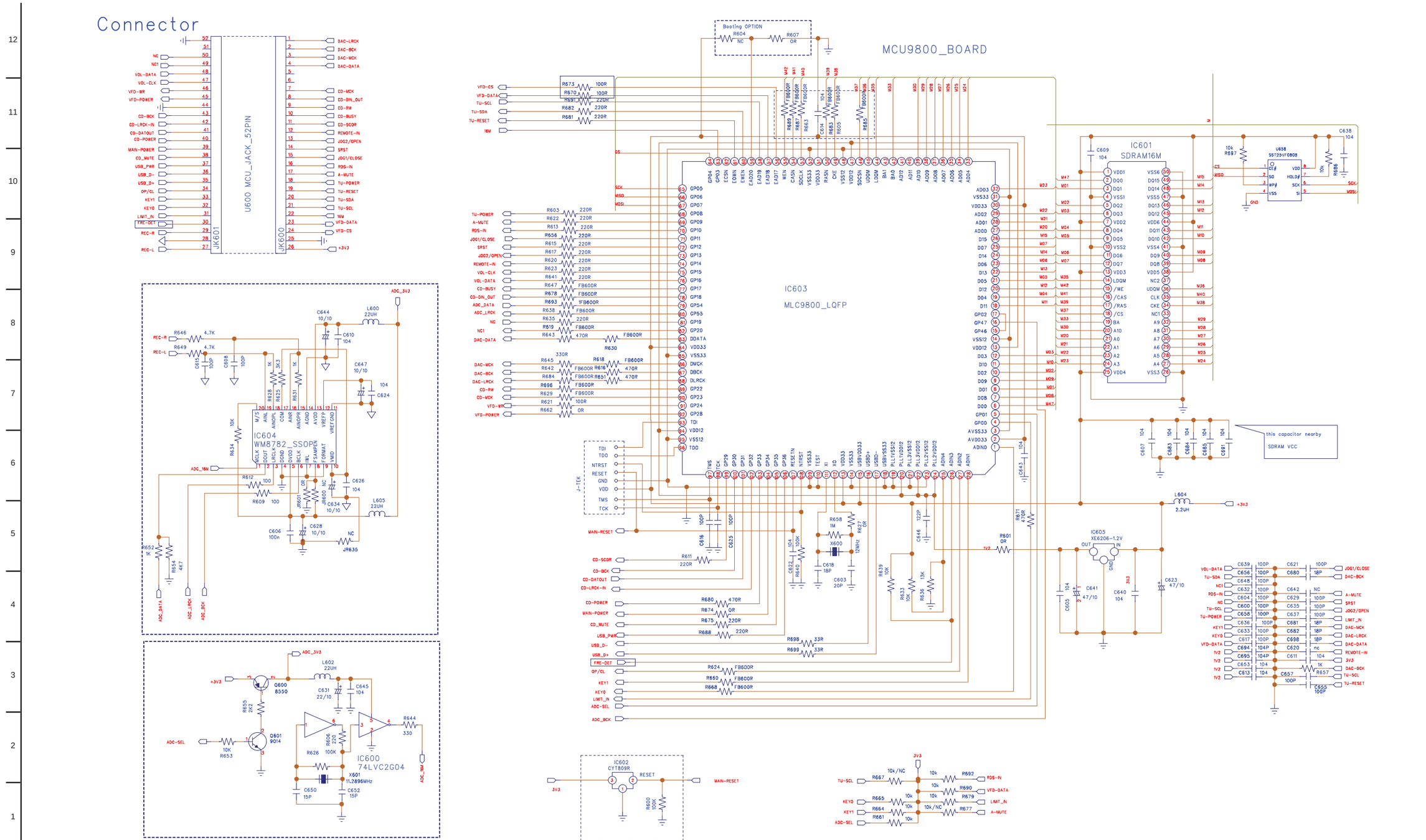
2. MAIN CIRCUIT DIAGRAM



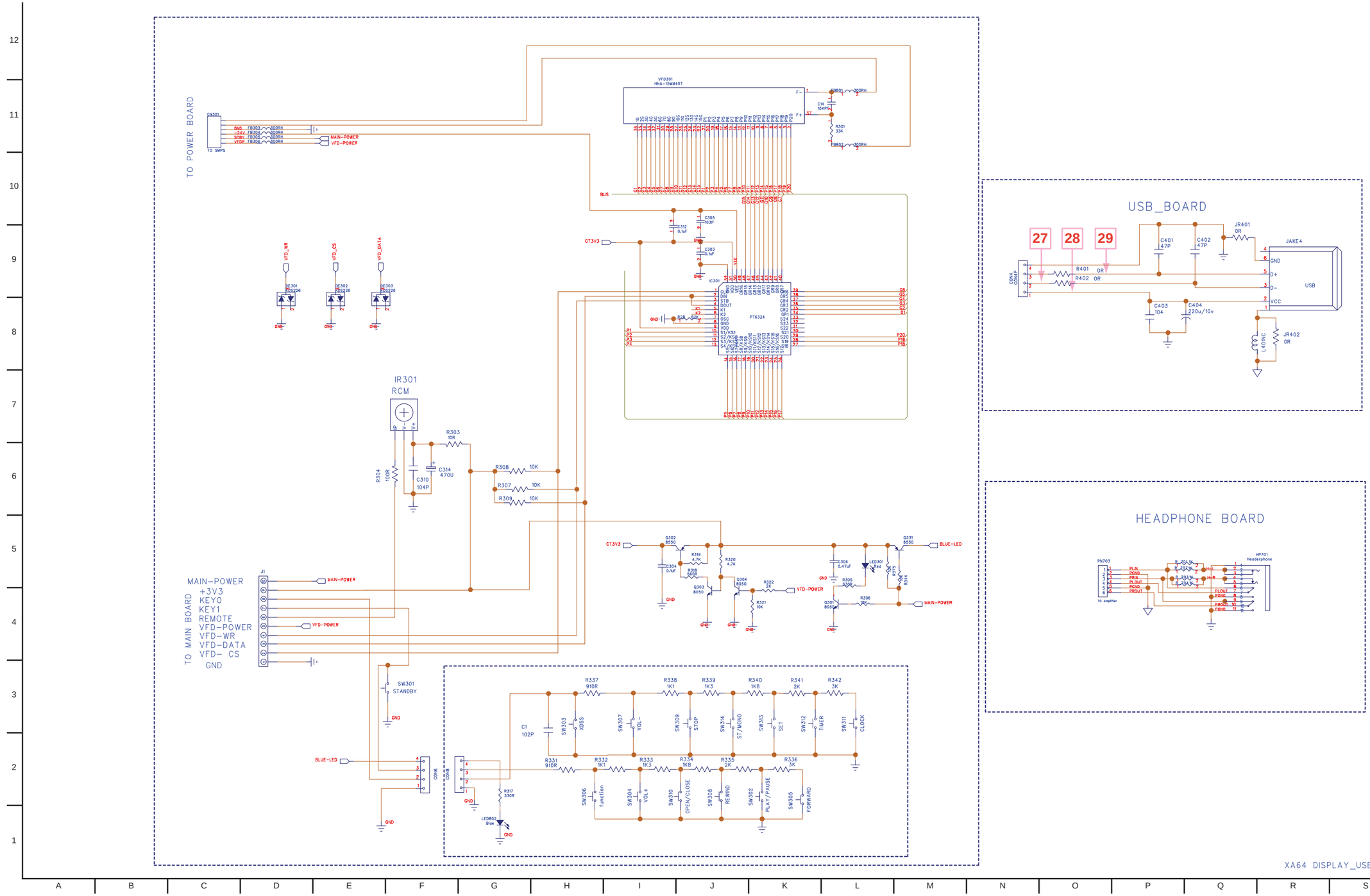
3. MAIN - CD CIRCUIT DIAGRAM



4. MCU CIRCUIT DIAGRAM



5. FRONT, USB & HEADPHONE CIRCUIT DIAGRAM



XA64 DISPLAY_USB CIRCUIT DIAGRAM

CIRCUIT VOLTAGE CHART

PIN NO.	TEST VOLT(V)
IC301(PT6324)	
1	3.2
2	3.1
3	3.1
4	3.2
5	-18
6	1.3
7	2.39
8	0
9	3.2
10	-18.3
12	-24.3
13	-21.9
14	-18.8
15	-18.2
16	-18.8
17	-15.8
18	-21.1
19	-15.8
20	-24.5
21	-24.5
22	24.5
23	-15.8
24	-24.5
25	-20.3
26	-24.5
27	-24.5
28	-24.5
29	-24.5
30	-24.5
31	-24.5
32	-24.5
33	-24.5
34	-24.5
35	-24.5
36	-24.6
37	-24.5
38	-24.5
39	-24.5
40	-24.5
41	-24.6
42	-24.5
43	-24.5
44	-24.5
45	-24.5
56	-24.6
47	-24.5
48	-24.3
49	-24.5
50	-24.6
51	3.2
52	0
IC502(BU9543)	
1	3.3

PIN NO.	TEST VOLT(V)
2	1.65
3	1.65
4	1.65
5	AGND
6	1.65
7	1.65
8	0.01
9	3.02
10	1.65
11	1.65
12	1.65
13	1.65
14	1.65
15	1.65
16	1.65
17	3.3
18	3.19
19	0.12
20	3.19
21	3.3
22	3.3
23	0.12
24	3.27
25	1.65
26	1.81
27	DGND
28	1.65
29	3.19
30	3.16
31	NC
32	DGND
33	3.29
34	1.65
35	1.68
36	1.61
37	1.81
38	1.42
39	1.62
40	1.3
41	1.65
42	DGND
43	DGND
44	1.65
45	1.65
46	0.32
47	3.28
48	1.23
49	1.3
50	DGND
51	DGND
52	NC
53	3.28
54	AGND
55	1.65

PIN NO.	TEST VOLT(V)
56	1.65
57	1.65
58	3.28
59	DGND
60	0.73
61	1.65
62	1.65
63	1.65
64	1.95
IC601(SDRAM)	
1	3.25
2	2.12
3	2.12
4	DGND
5	2.12
6	2.12
7	3.25
8	2.12
9	2.12
10	DGND
11	2.15
12	2.15
13	3.25
14	0.9
15	1.53
16	2.93
17	3.09
18	0.9
19	0.9
20	0.9
21	0.9
22	0.9
23	0.9
24	0.9
25	3.25
26	DGND
27	0.9
28	0.9
29	0.9
30	0.9
31	0.9
32	0.9
33	NC
34	0.9
35	1.53
36	0.9
37	NC
38	3.25
39	2.12
40	2.12
41	DGND
42	2.15
43	2.15
44	3.25

PIN NO.	TEST VOLT(V)
45	2.15
46	2.15
47	DGND
48	2.15
49	2.15
50	DGND
IC603(MLC9800)	
1	3.25
2	3.25
3	AGND
4	3.25
5	3.2
6	2.12
7	2.12
8	2.12
9	2.12
10	2.12
11	2.12
12	2.12
13	1.2
14	AGND
15	0.38
16	3.1
17	0.38
18	2.15
19	2.15
20	2.15
21	2.15
22	2.15
23	2.15
24	2.15
25	2.15
26	2.15
27	2.15
28	0.89
29	0.89
30	3.25
31	DGND
32~46	0.9
47	1.2
48	DGND
49	3.02
50	3.09
51	3.25
52	DGND
53	1.53
54	1.53
55	2.93
56	2.93
57	2.93
58	3.25
59	3.25
60~62	3.25
63	1.36

PIN NO.	TEST VOLT(V)
64	2.12
65	2.68
66	0.01
67	1.31
68	0.01
69	3.18
70	0.28
71	3.21
72	0.47
73	3.21
74	3.24
75	3.25
76	3.25
77	3.3
78	2.12
79	0.01
80	0.02
81	3.16
82	2.76
83	1.64
84	3.25
85	DGND
86	1.65
87	0.77
88	1.06
89	1.59
90	3.2
91	1.24
92	1.24
93	2.14
94	1.3
95	DGND
96	2.1
97	1.8
98	1.33
99	0.08
100	1.61
101	1.6
102	1.67
103	0.05
104	9.4mV
105	3.25
106	9.4mV
107	3.26
108	0.05
109	DGND
110	DGND
111	1.55
112	1.35
113	3.3
114	DGND
115	3.3
116	0.06
117	3.08

PIN NO.	TEST VOLT(V)
118	DGND
119	DGND
120	1.20V
121	DGND
122	1.20V
123	DGND
124	1.2
125	1.85
126	0.3
127	1.5
128	3.24
IC604(WM8782)	
1	0.02
2	0.02
3	0.05
4	DGND
5	3.3
6	0.03
7	DGND
8	3.28
9	DGND
10	0.04
11	GND
12	0.06
13	3.25
14	AGND
15	0.19
16	0.19
17	0.04
18	0.19
19	0.19
20	0.04
IC605(XE-6206)	
1	GND
2	3.31
3	1.2
IC606(FLASH)	
1	3.25
2	2.12
3	2.12
4	DGND
5	2.12
6	2.12
7	3.25
8	2.12
U200(TDA7266)	
1	1.8
2	1.86
3	10.7
4	1.52
5	0
6	1.33
7	1.33
8	GND

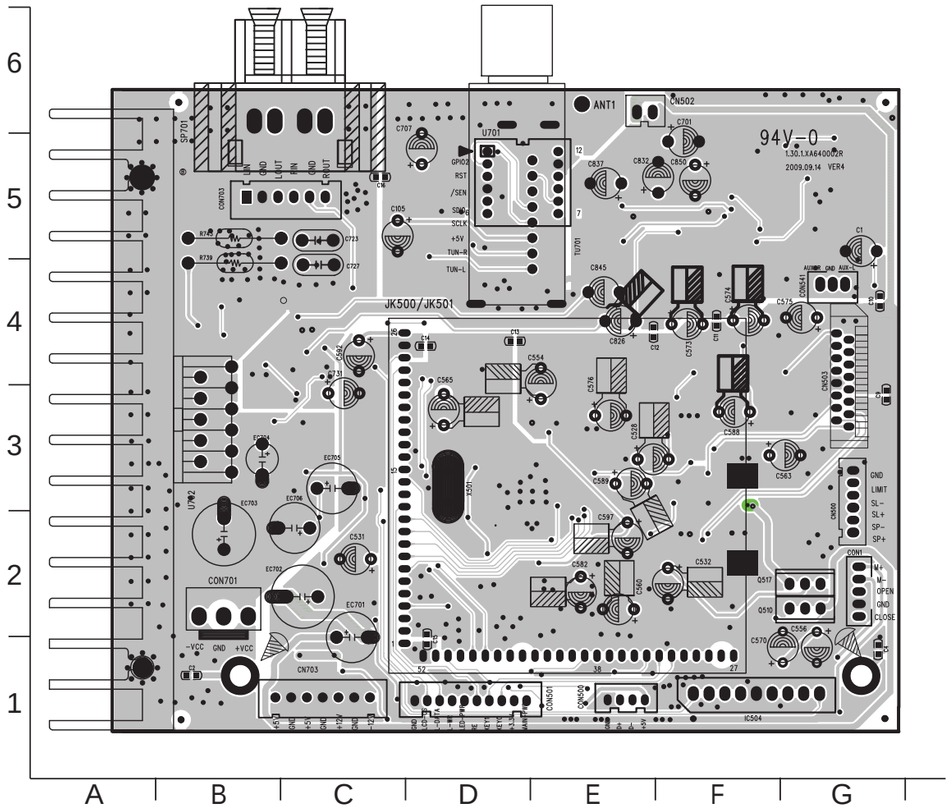
PIN NO.	TEST VOLT(V)
9	GND
10	0
11	0
12	1.52
13	10.7
14	1.8
15	1.78
U503(BD3490FV)	
1	4.17
2	4.17
3	4.17
4	4.17
5	4.17
6	4.17
7	4.17
8	4.17
9	4.17
10	4.17
11	4.17
12	4.17
13	4.17
14	4.17
15	4.18
16	4.2
17	4.2
18	4.17
19	4.18
20	4.17
21	4.17
22	4.17
23	4.17
24	8.36
25	3.21
26	3.21
27	GND
28	4.19
U504(BA58260)	
1	3.8
2	3.3
3	1.67
4	0.2
5	6.89
6	0.89
7	4.5
8	GND
9	1.66
10	1.66
11	3.45
12	3.6
13	GND
14	1.6
15	3.15
16	3.65
17	1.65

PIN NO.	TEST VOLT(V)
18	1.65
19	1.65
20	1.65
21	7.5
22	7.5
23	1.65
24	1.65
25	1.65
26	3.35
27	3.2
28	GND
U702	
1	-20.5
2	0
3	20.5
4	0
5	11.4
6	-20.5
7	0
8	0
9	0
10	0
11	0

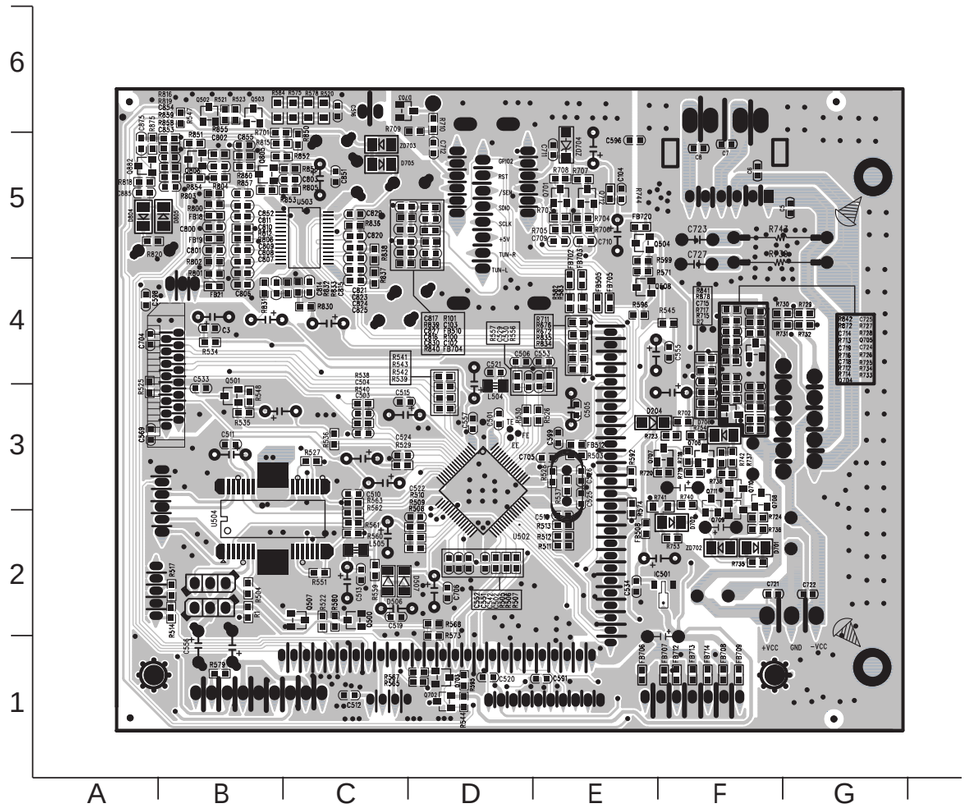
PRINTED CIRCUIT BOARD DIAGRAMS

1. MAIN P.C.BOARD

(TOP VIEW)

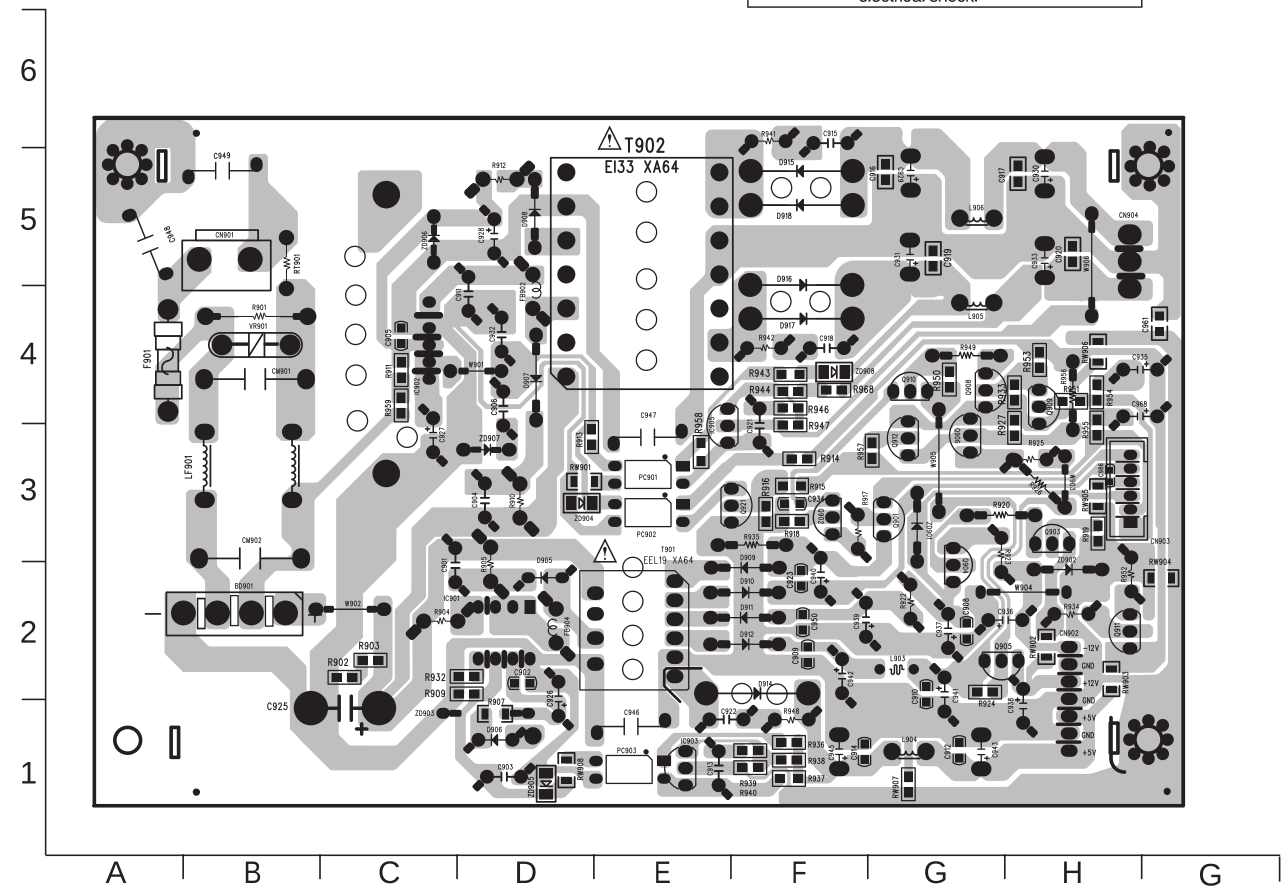


(BOTTOM VIEW)



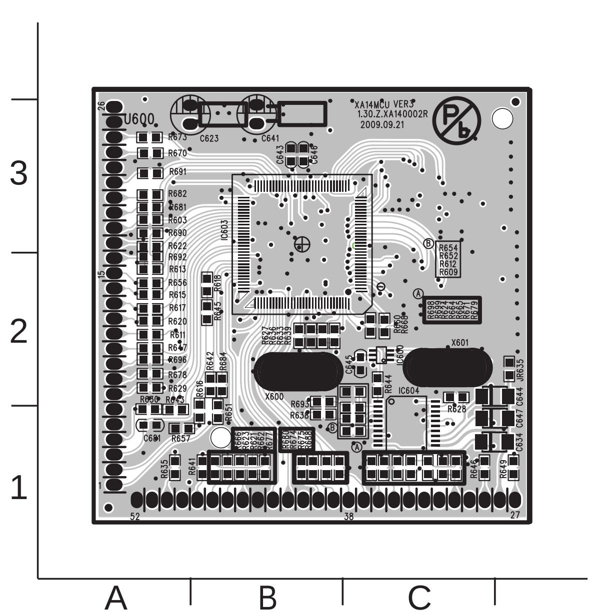
2. SMPS P.C.BOARD

NOTE) ⚠ Warning
Parts that are shaded are critical with respect to risk of fire or electrical shock.

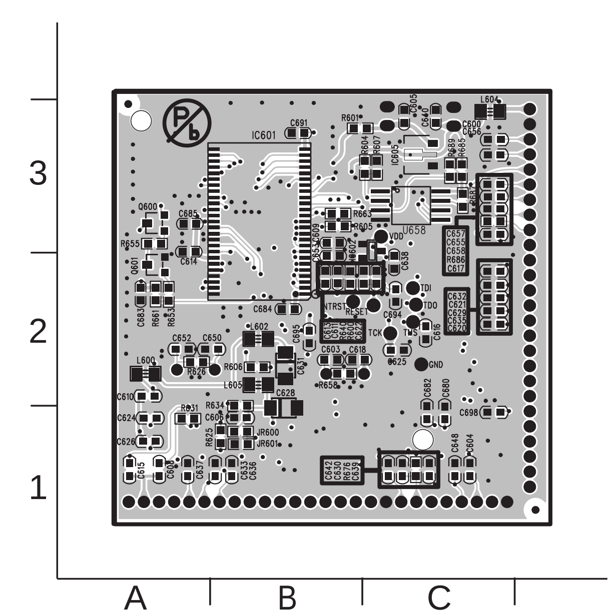


3. MCU P.C.BOARD

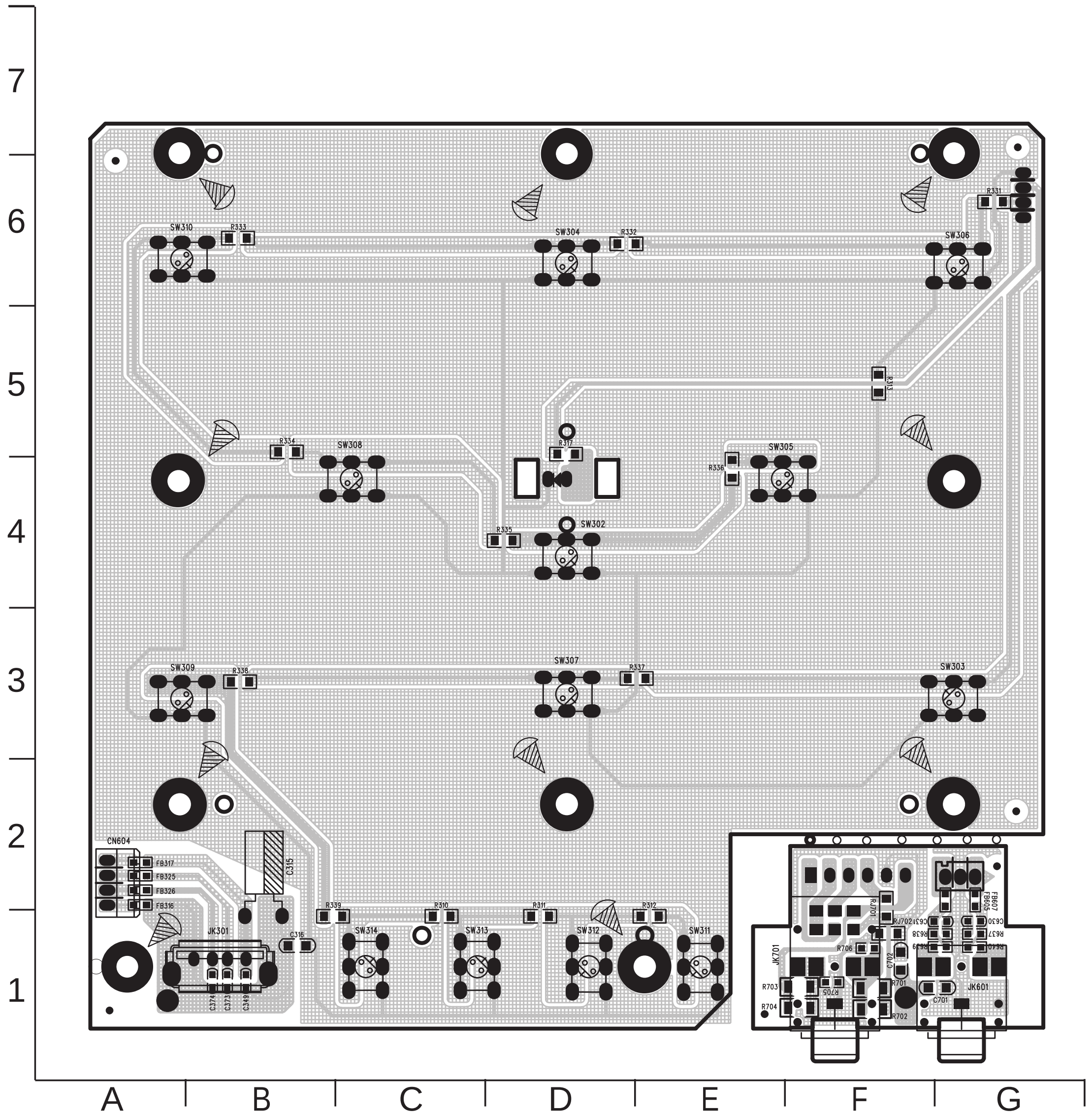
(TOP VIEW)



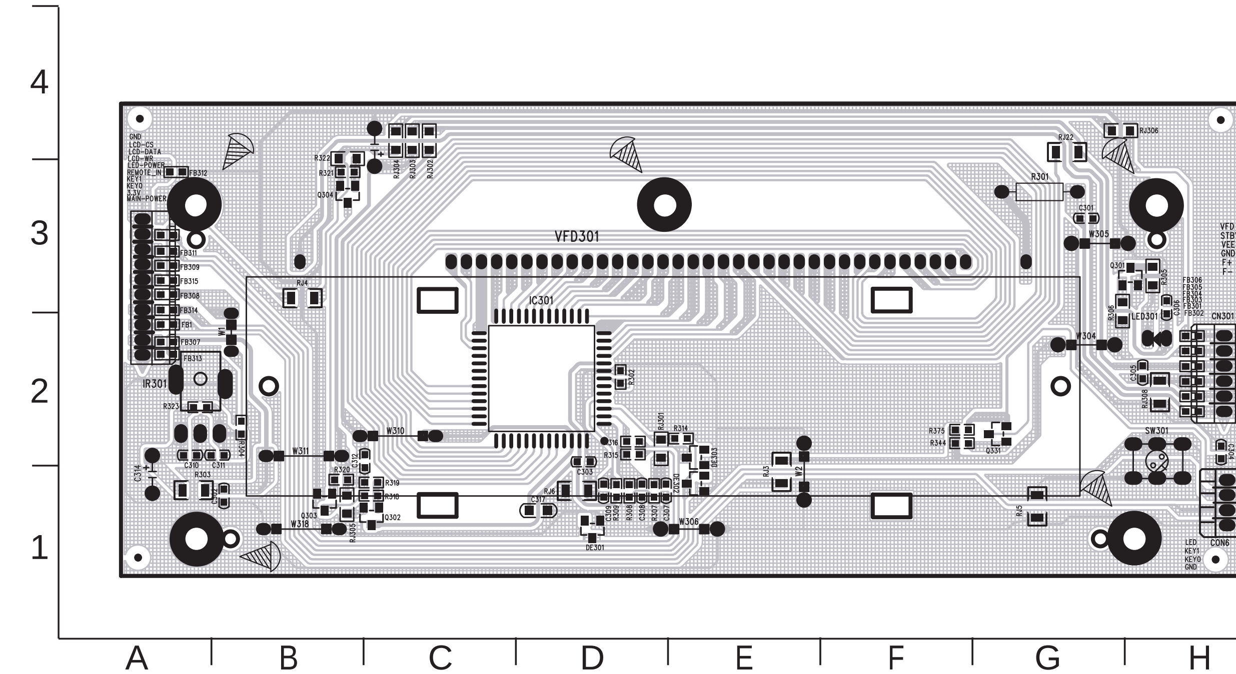
(BOTTOM VIEW)



4. KEY P.C.BOARD



5. FRONT P.C.BOARD



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