Av. Sor Juana Inés de la Cruz No 555
Col. San Lorenzo
Tlalnepantla, Estado de México CP 54033
Tel. 321 19 00 Fax. 5 657549
Lada sin costo 01 800 50 481 00

P/NO : AFN56903619

SERVICE MANUAL

MODEL: DP372B

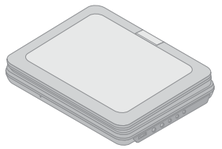
MARCH , 2008

LG

PORTABLE DVD
SERVICE MANUAL

MODEL: DP372B

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



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SECTION 1

SUMMARY

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PRODUCT SAFETY SERVICING GUIDELINES FOR PORTABLE DVD 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 are 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:

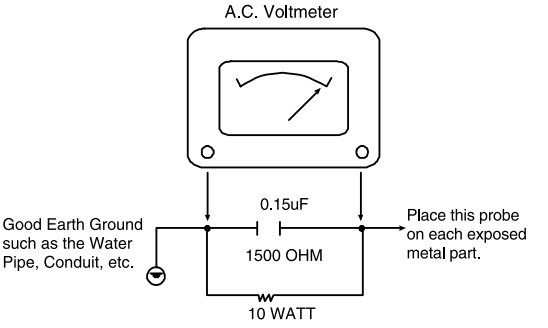
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

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 PORTABLE DVD 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 publication, always follow the safety precautions.
Remember Safety First :

General Servicing Precautions

1. Always unplug the PORTABLE DVD 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 PORTABLE DVD 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 which instruments covered by this service manual might be equipped.

5. Do not apply AC power to this PORTABLE DVD and / or any of its electrical assemblies unless all solid state 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.)

SPECIFICATIONS

• DVD PLAYER

Power requirements	DC 12V
Power consumption	12W
External dimensions	207 x 39 x 168mm (W x H x D)
Net weight (Approx.)	0.85kg
Operating temperature	5°C to 40°C
Operating humidity	5% to 90%
Laser semiconductor	laser
Signal system	NTSC

• CONNECTORS

Audio/Video Output	ø3.5mm mini jack x 1
- Video: 1.0V(p-p), 75Ω, sync negative	
- Audio: 1.5Vrms (1kHz, 0dB)	
Earphone terminal	ø3.5mm stereo mini jack x 2

• LIQUID CRYSTAL DISPLAY

Panel size	7inches wide (diagonal)
Projection system	R.G.B. stripe
Driving system	TFT active matrix
Resolution	480 x 234 (WQVGA)

• SUPPLIED ACCESSORIES

RCA Video/Audio cable
AC Adapter (MPA-630)
Automotive Adapter (DPDC1)
Remote Control
Battery for Remote Control (Lithium Battery)

MEMO

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EXPLODED VIEWS

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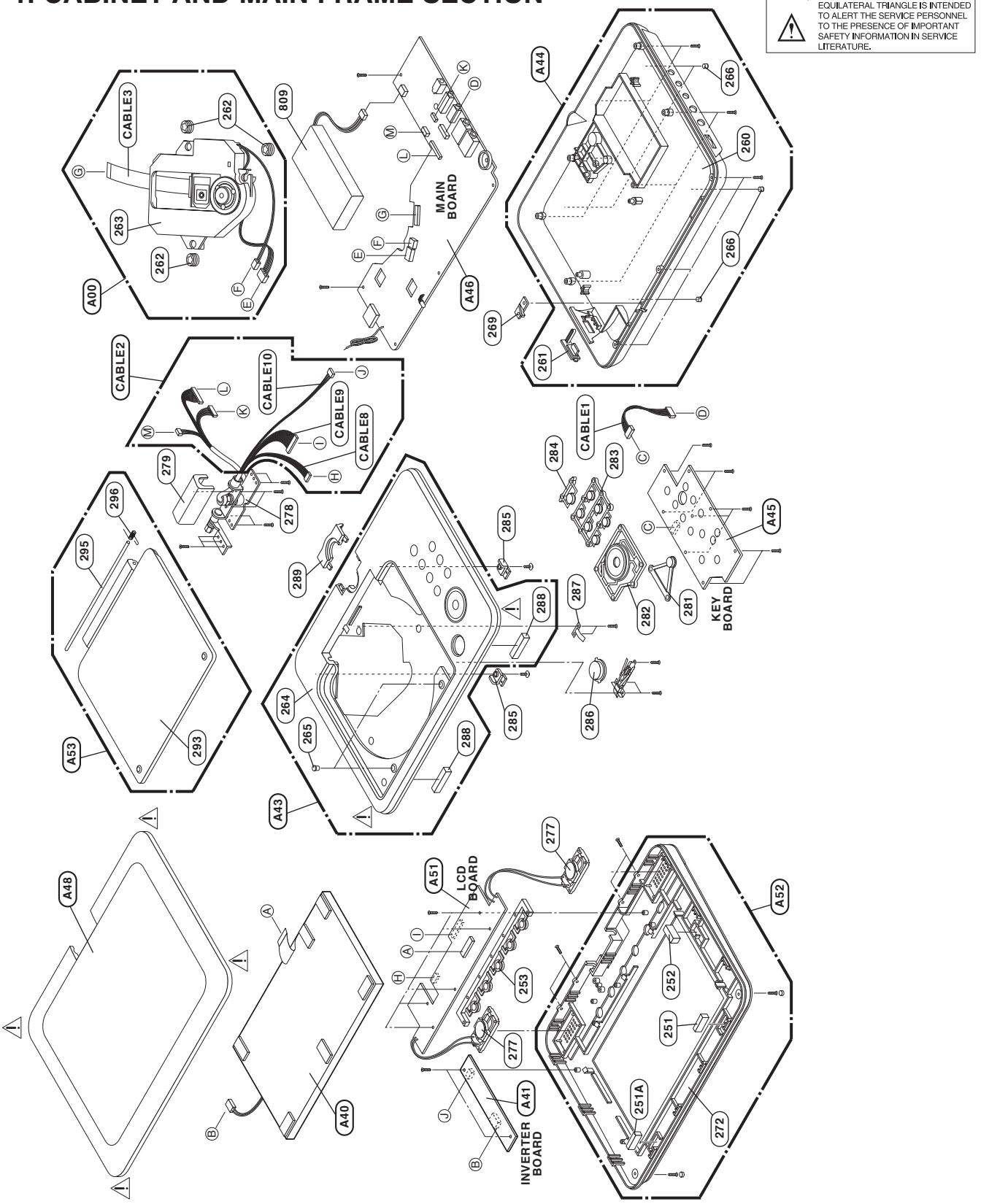
EXPLODED VIEWS

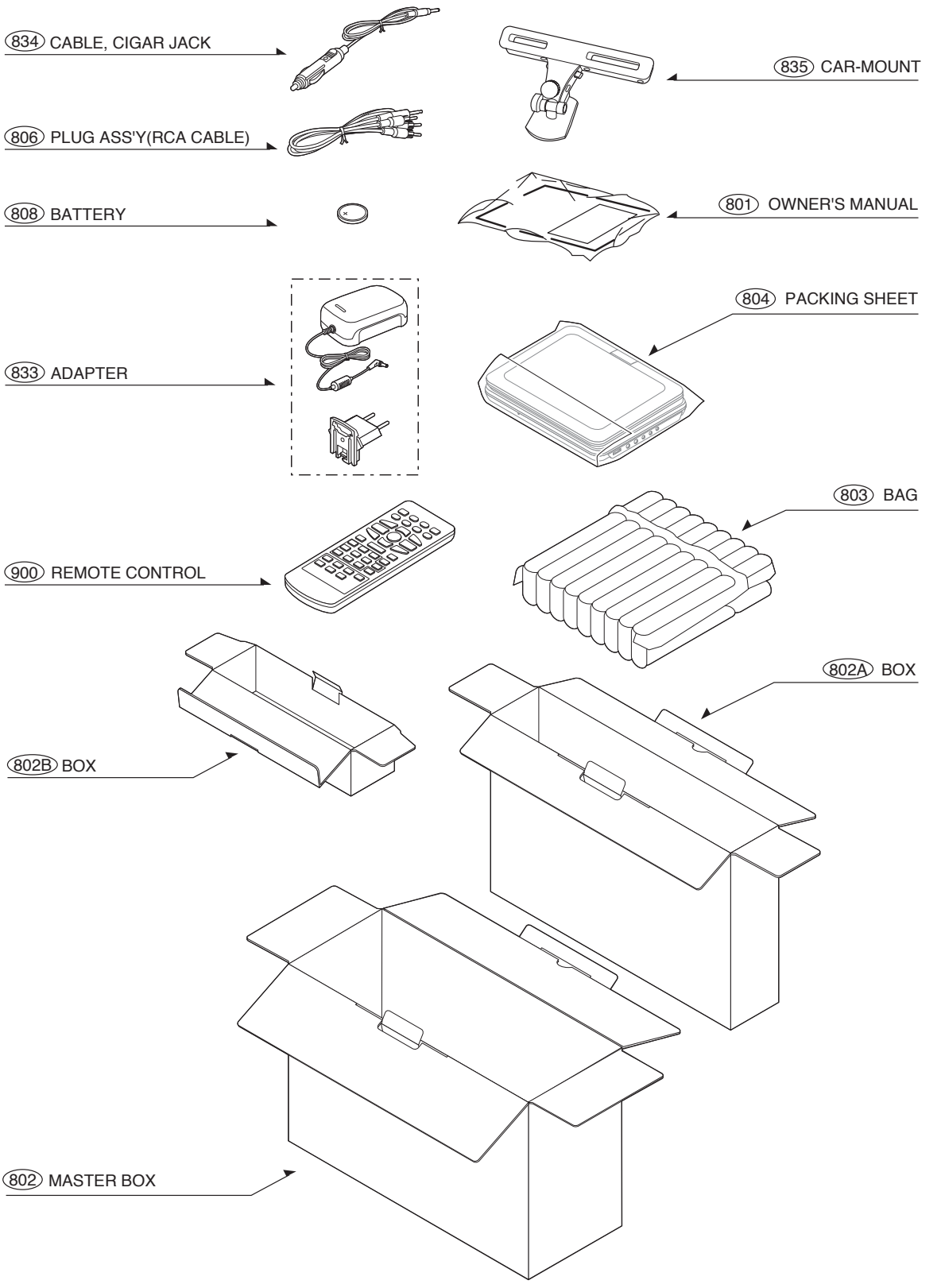
1. CABINET AND MAIN FRAME SECTION

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.



A | B | C | D

2. PACKING ACCESSORY SECTION



MEMO

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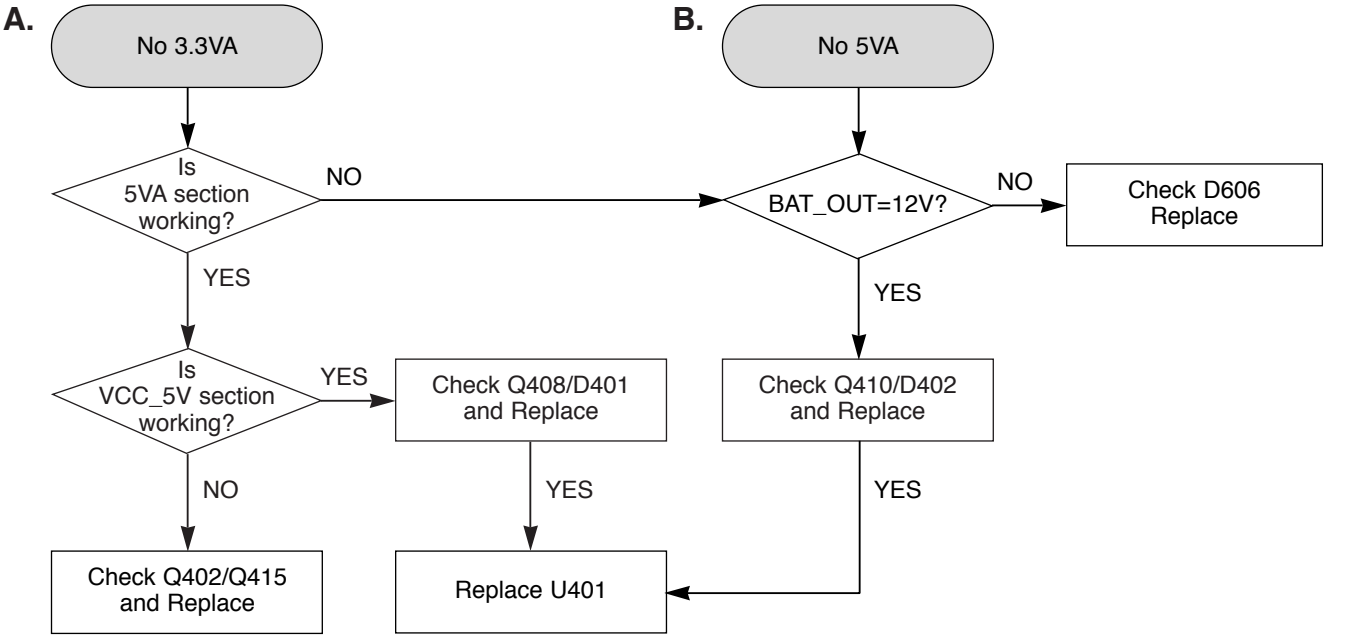
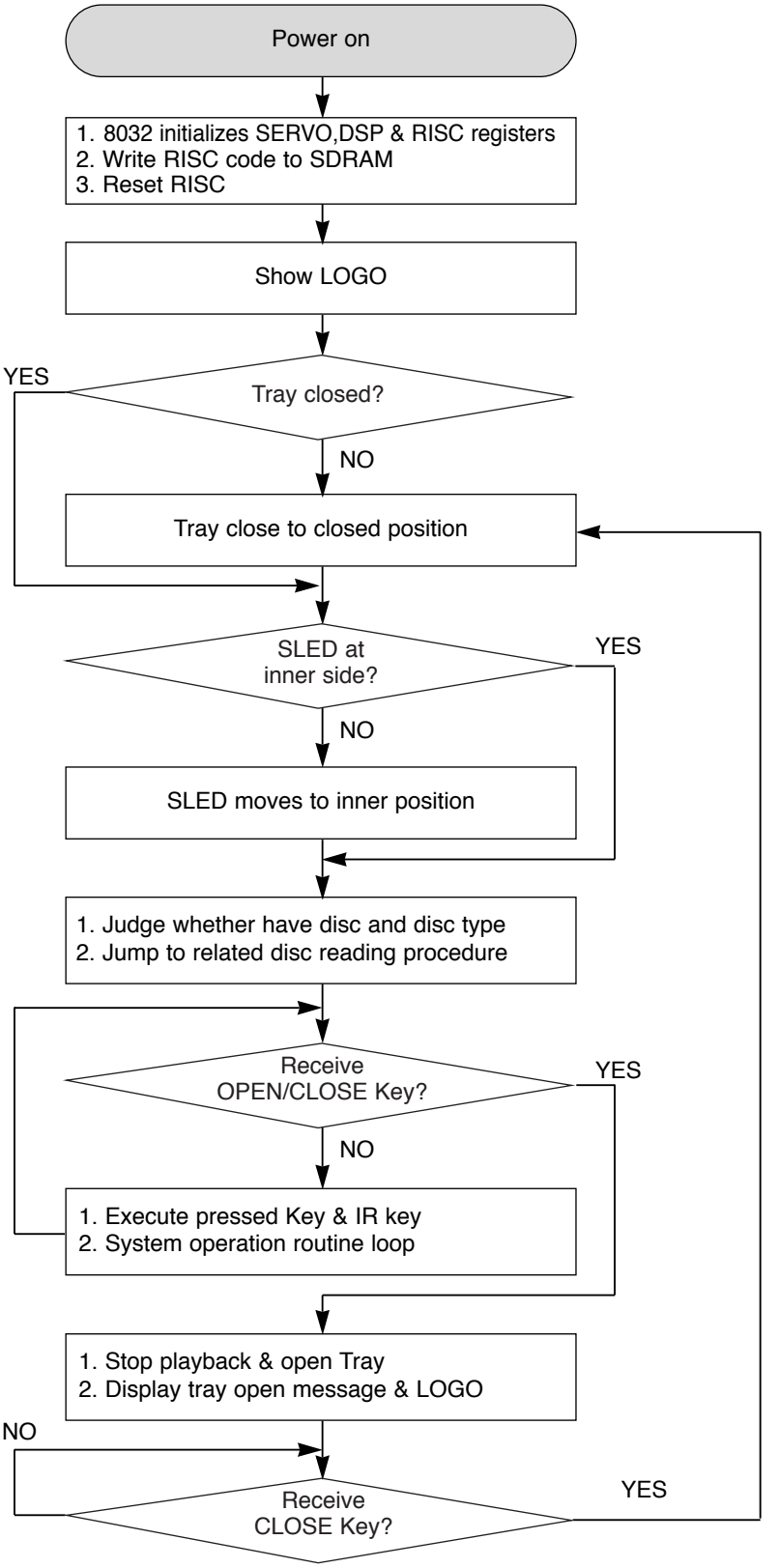
ELECTRICAL TROUBLESHOOTING GUIDE

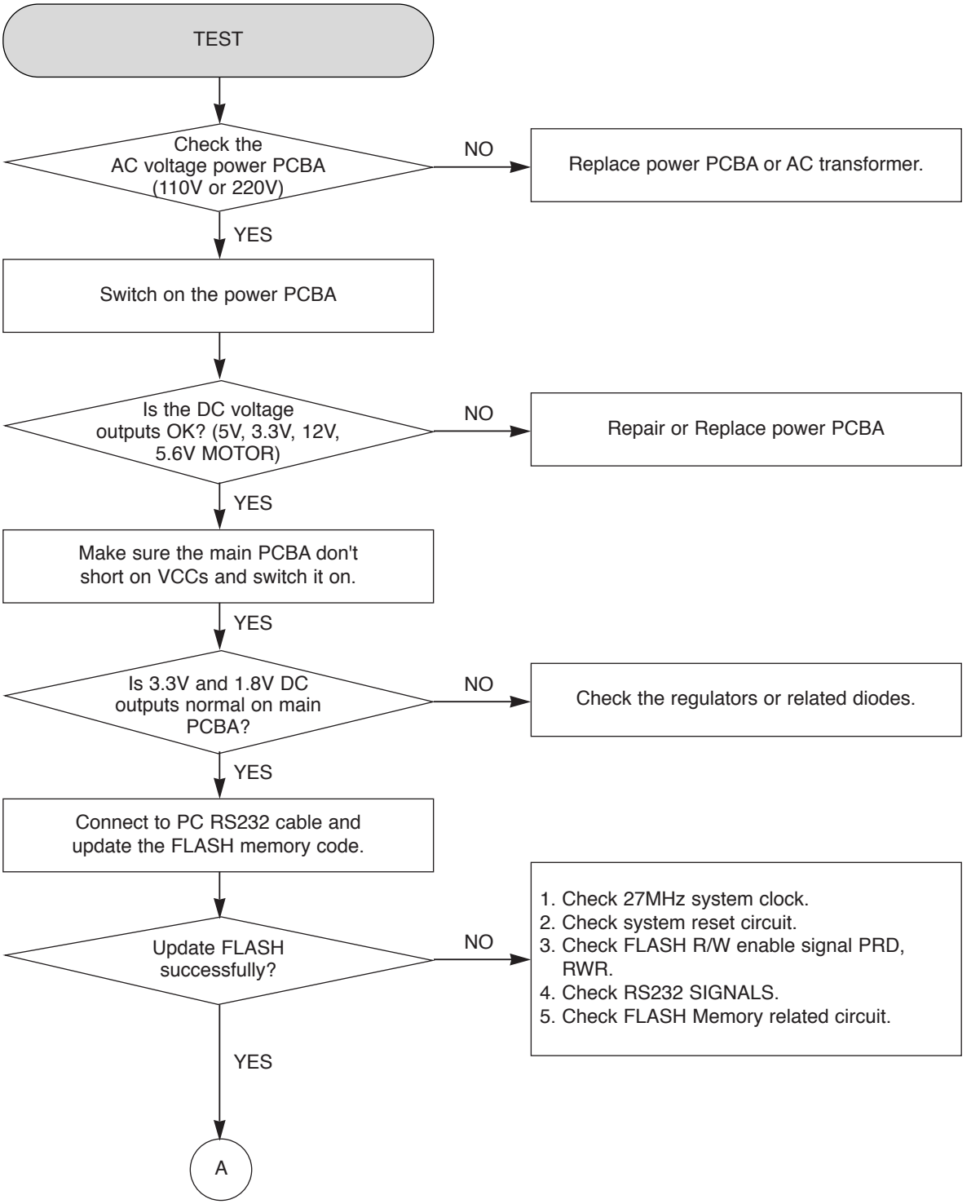
1. POWER CHECK FLOW

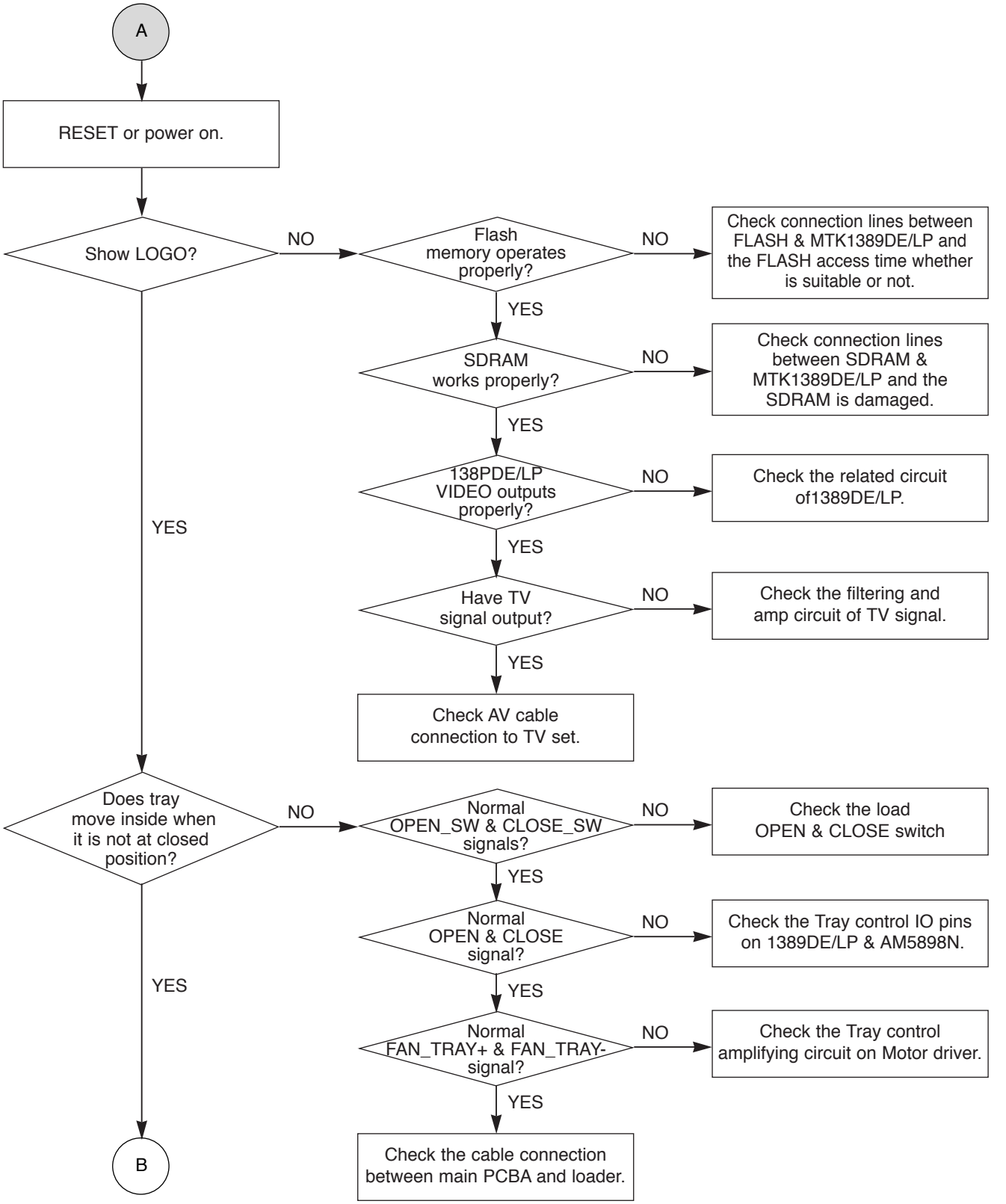


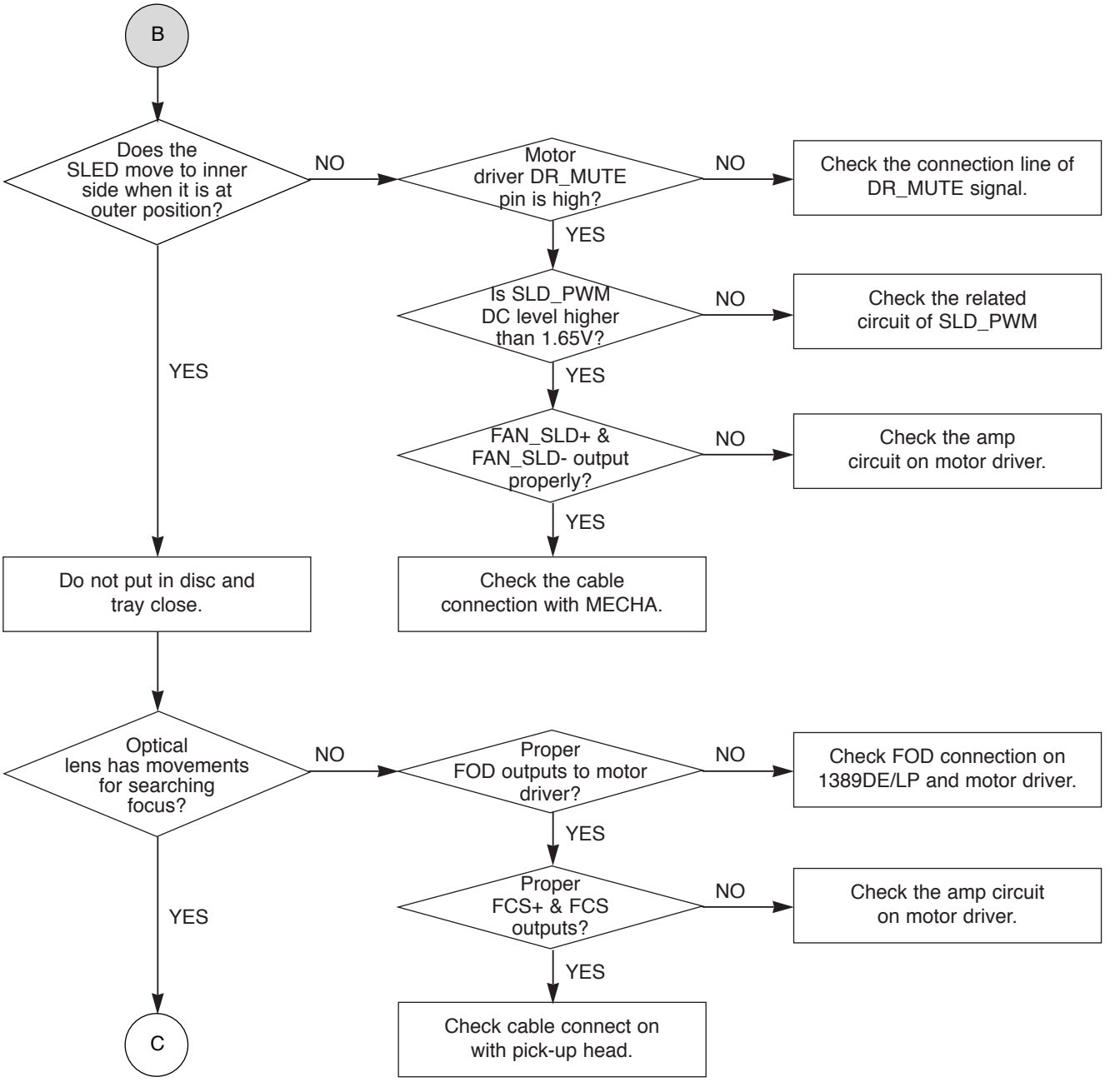
2. SYSTEM OPERATION FLOW

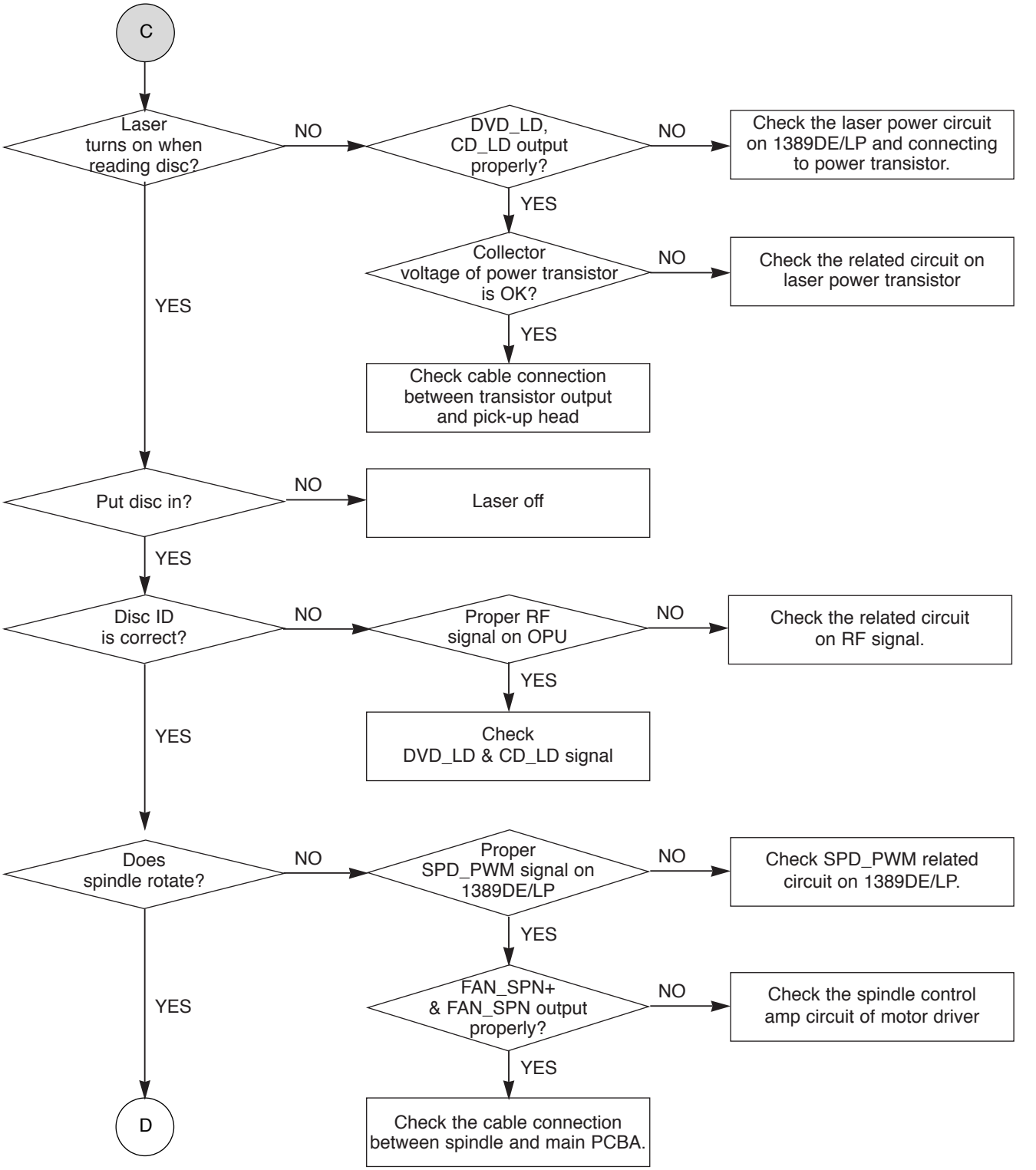


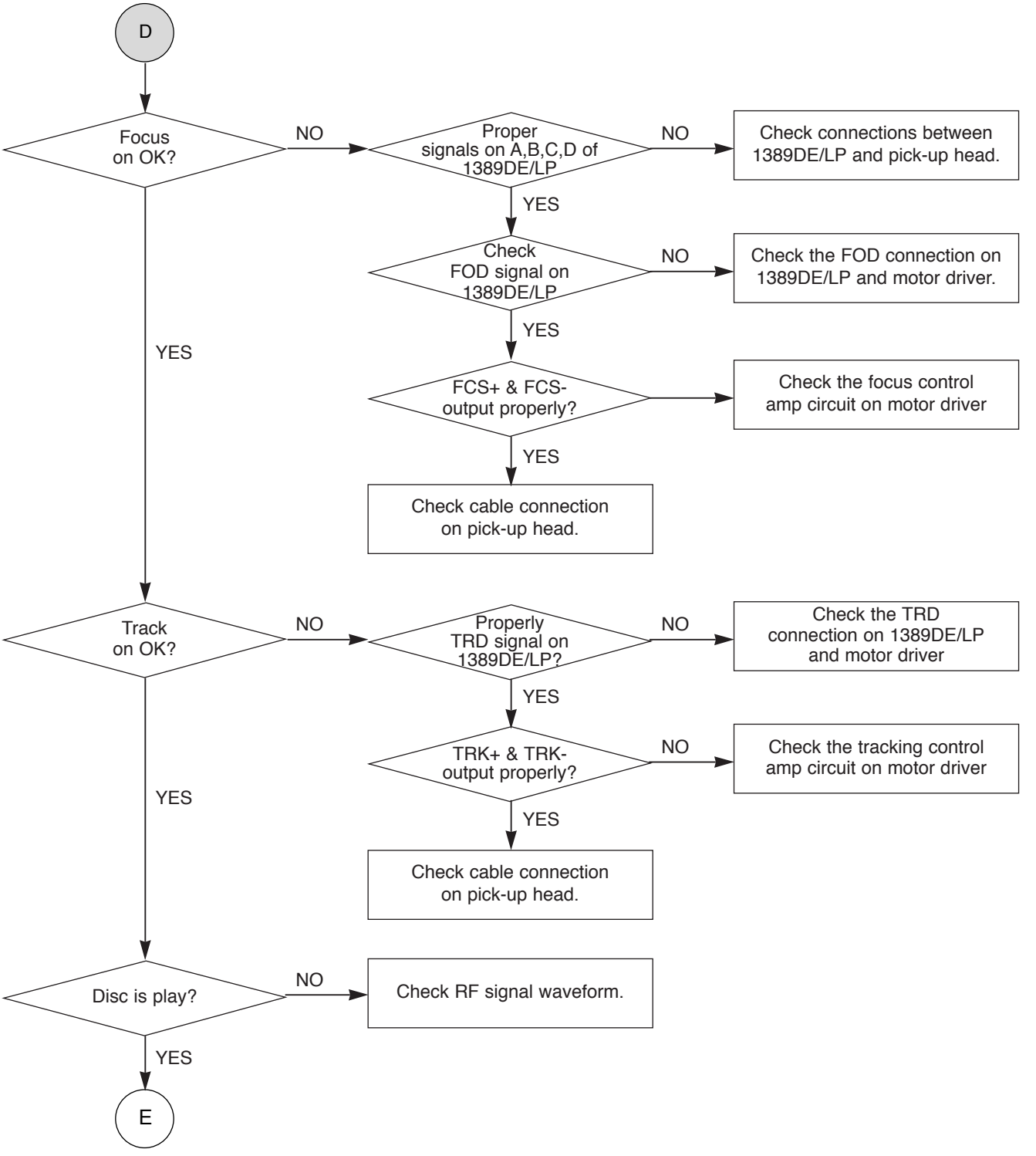
3. SYSTEM TEST FLOW

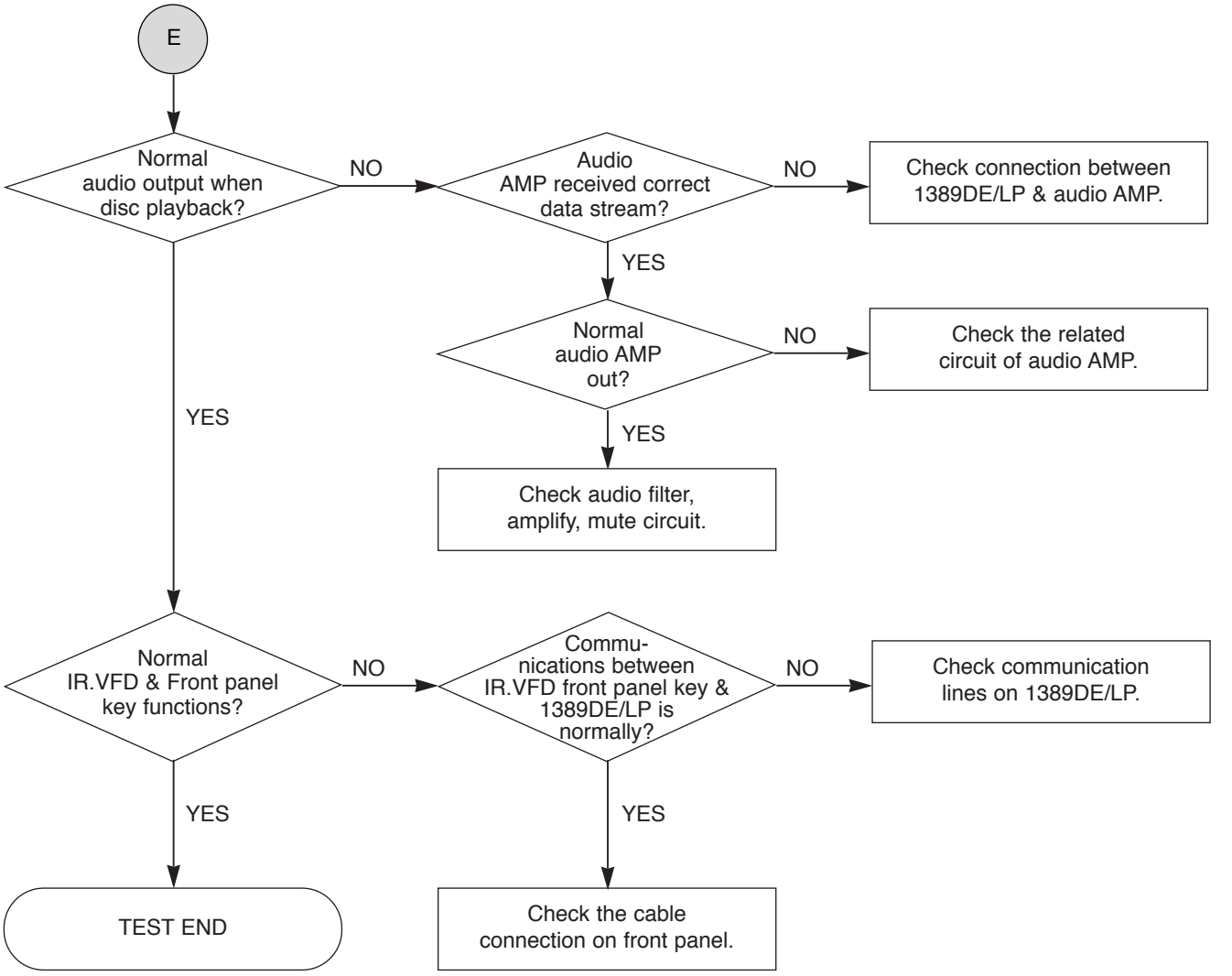








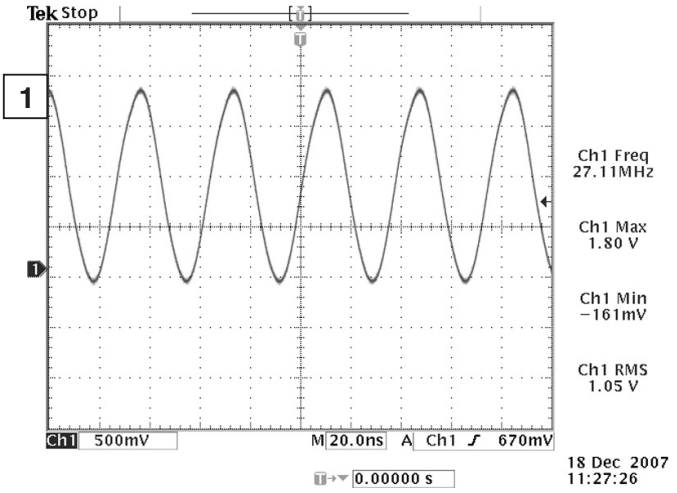




DETAILS AND WAVEFORMS ON SYSTEM TEST AND DEBUGGING

1. SYSTEM 27MHz CLOCK, RESET, FLASH SCK SIGNAL.

1-1. 1389DE/LP main clock is at 27MHz(Y201)



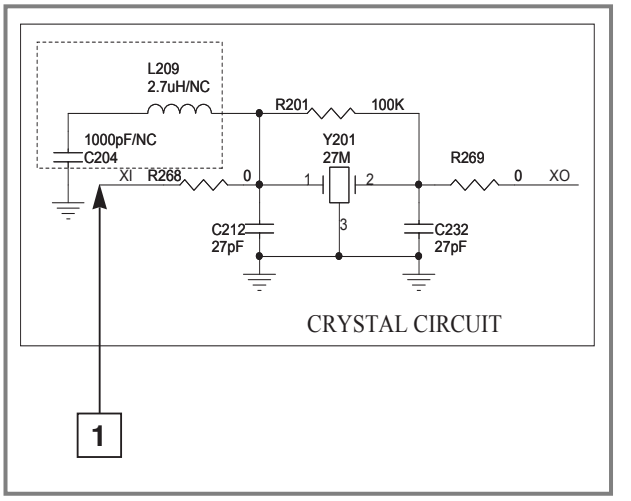
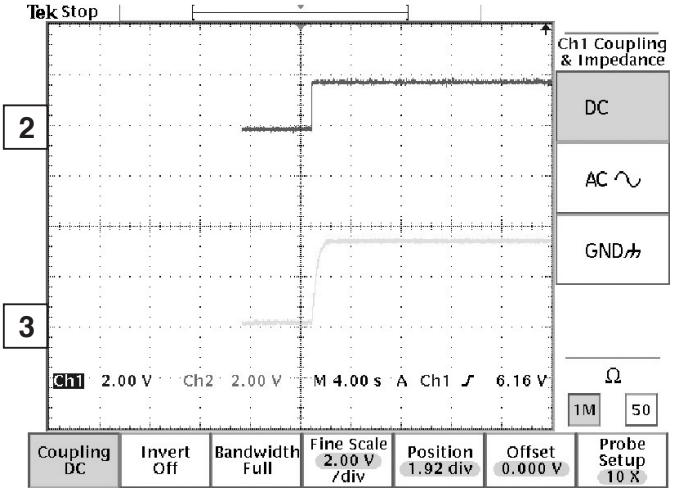


FIG 1-1

1-2. 1389DE/LP reset is active high.



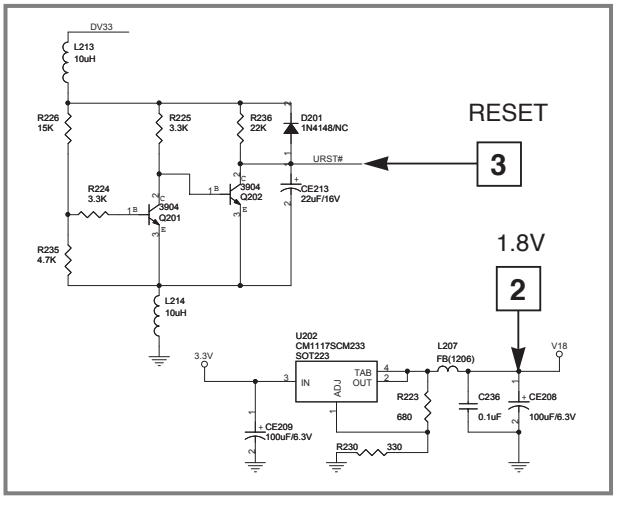
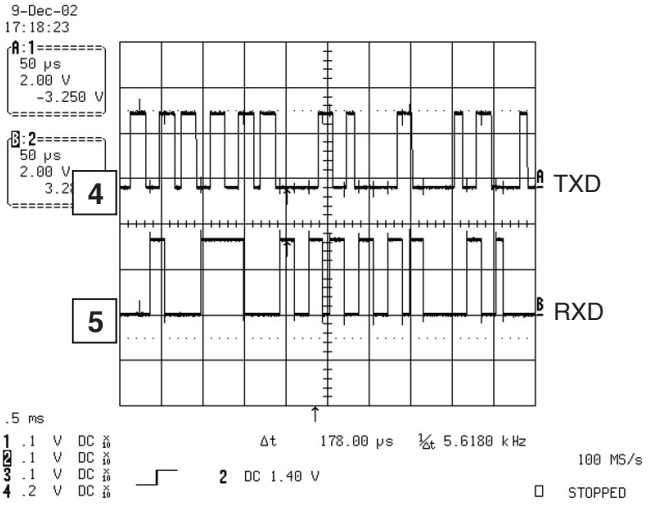


FIG 1-2

1-3. RS232 waveform during procedure(Downloading)



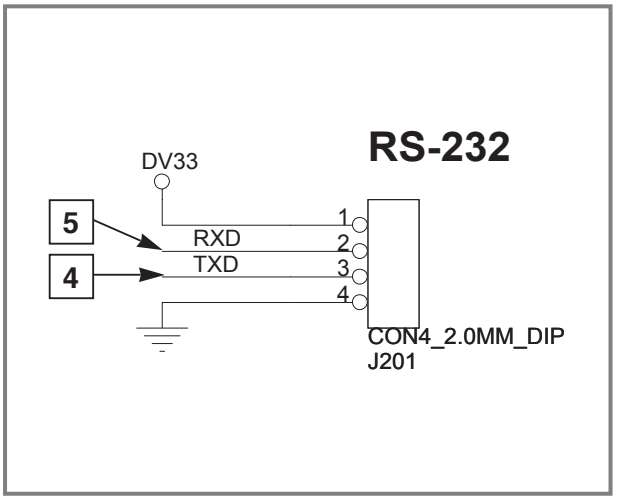
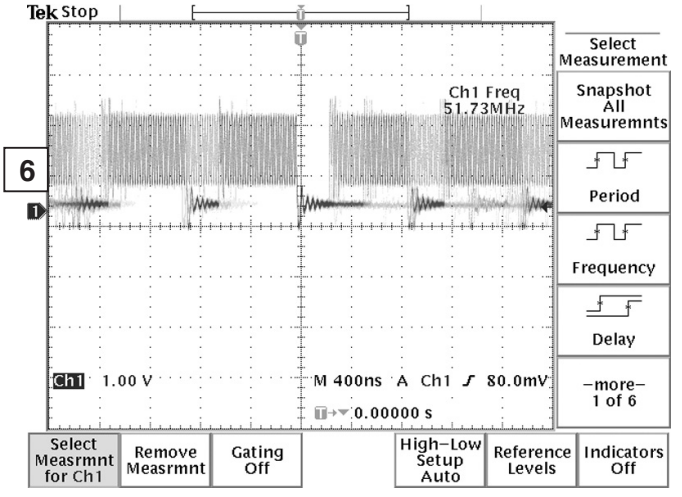


FIG 1-3

1-4. FLASH SCK



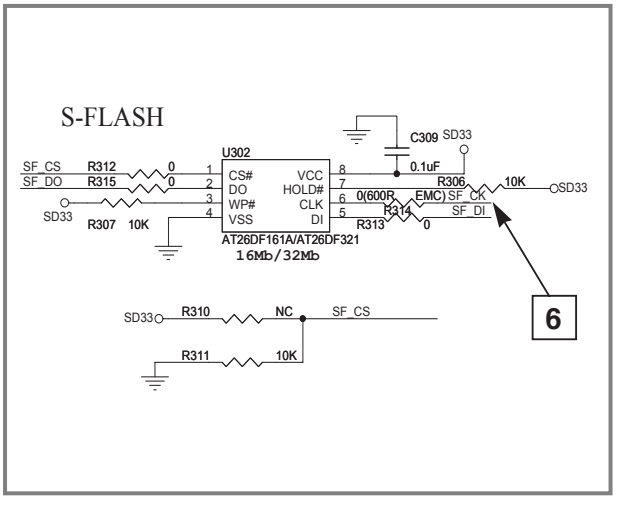
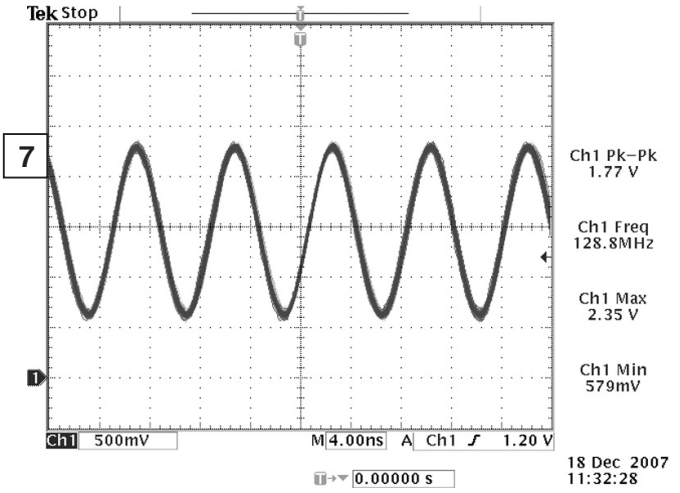


FIG 1-4

2. SDRAM CLOCK

DCLK=128MHz, Vp-p=1.77, Vmax=2.35V



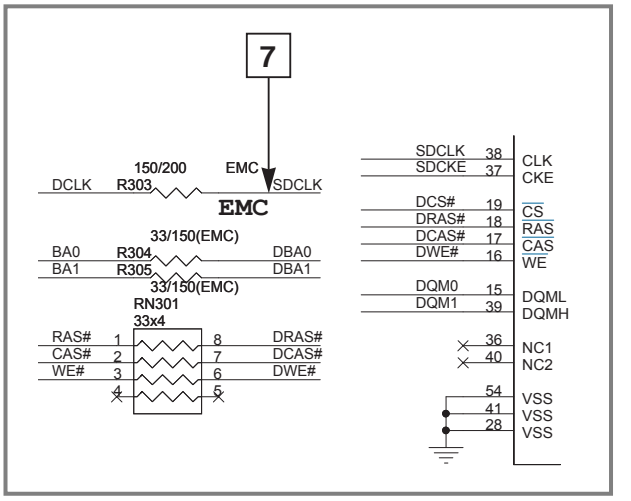
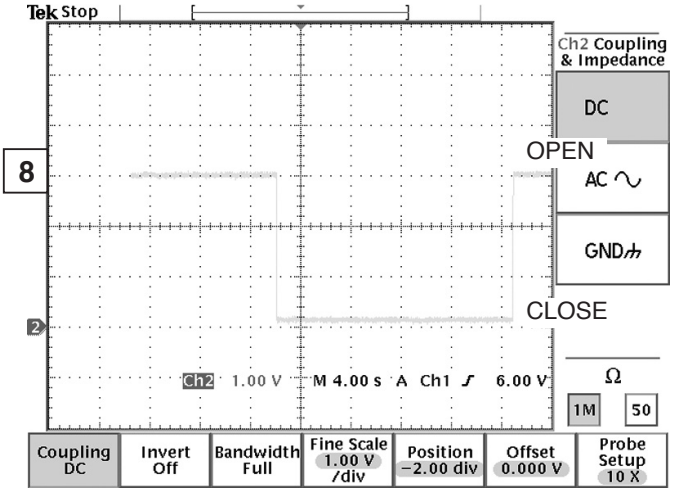


FIG 2-1

3. TRAY OPEN/CLOSE SIGNAL



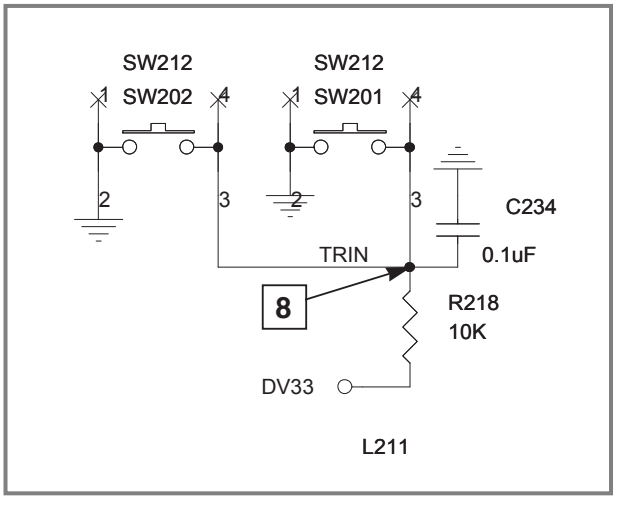


FIG 3-1

4. SLED CONTROL RELATED SIGNAL

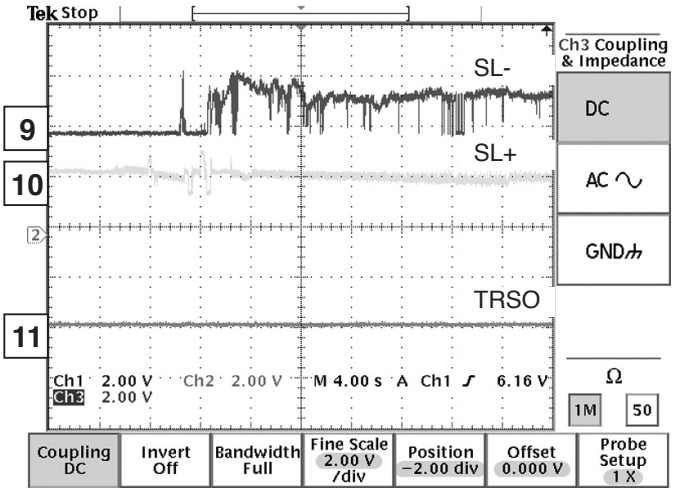


FIG 4-1 < DVD >

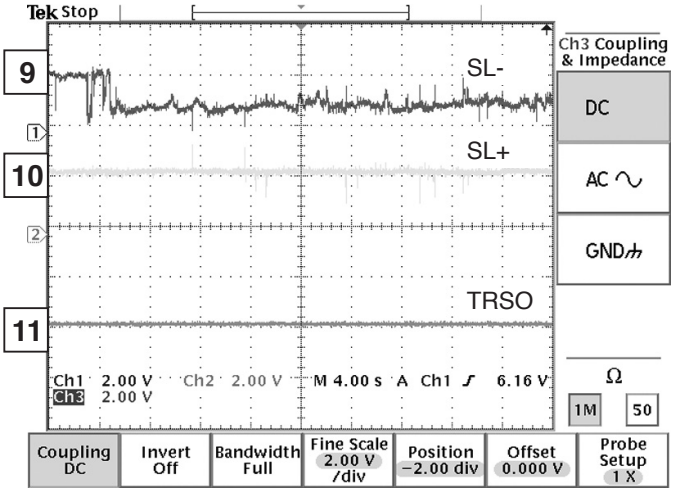
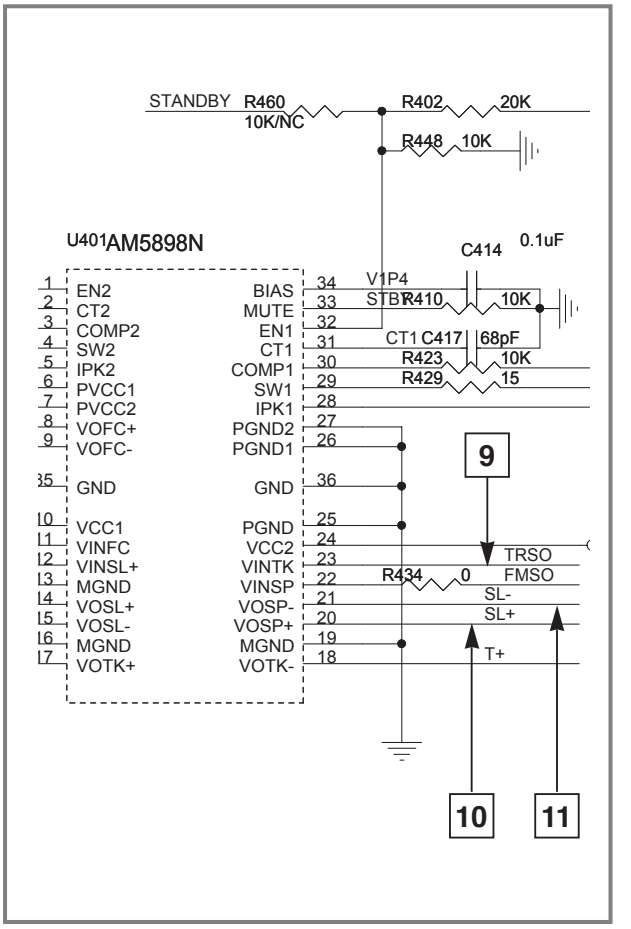
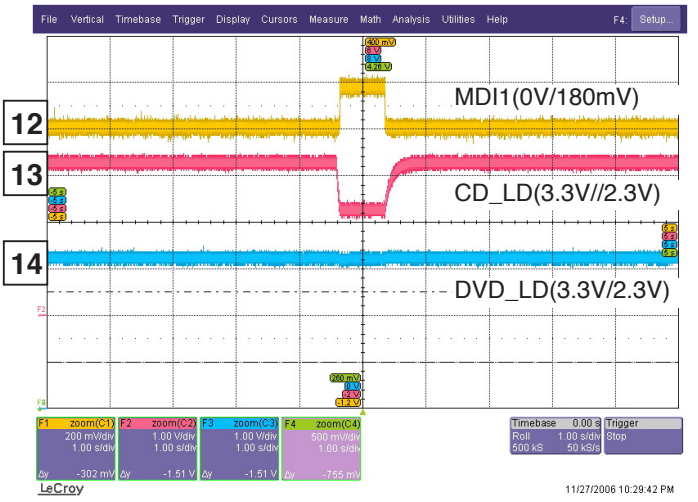


FIG 4-2 < CD >



5. LASER POWER CONTROL RELATED SIGNAL



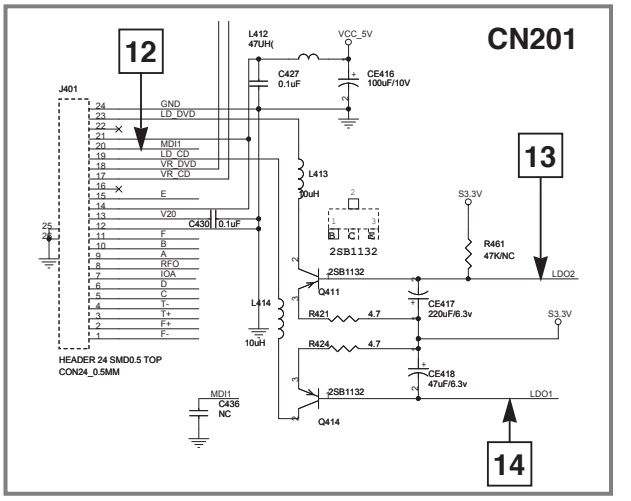
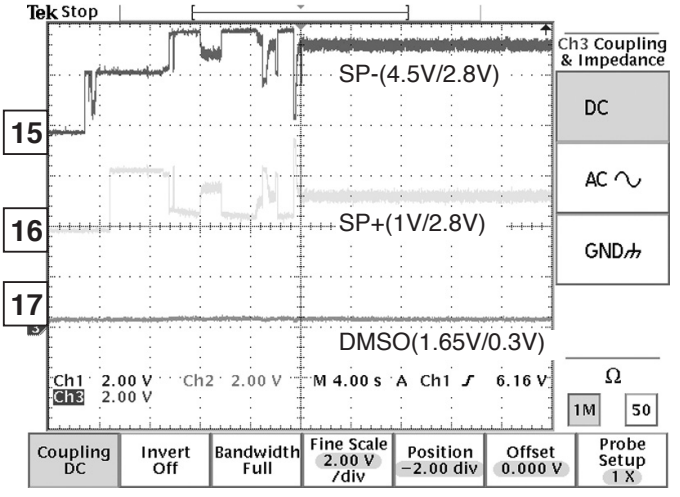


FIG 5-1

6. SPINDLE CONTROL WAVEFORM



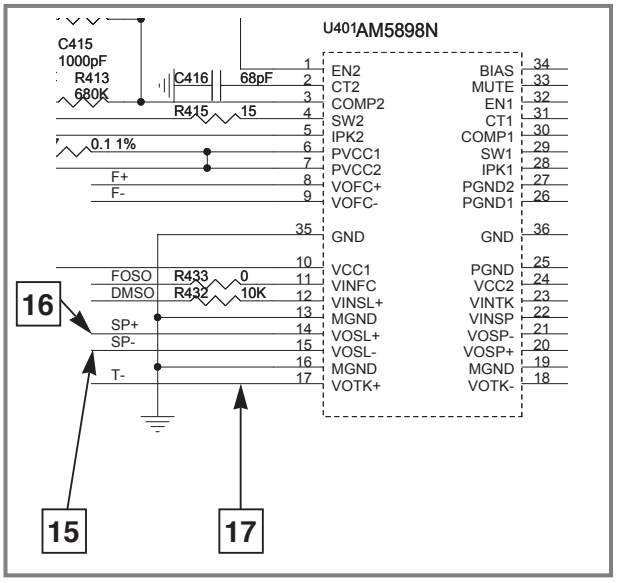


FIG 6-1

7. FOCUS ON WAVEFORM

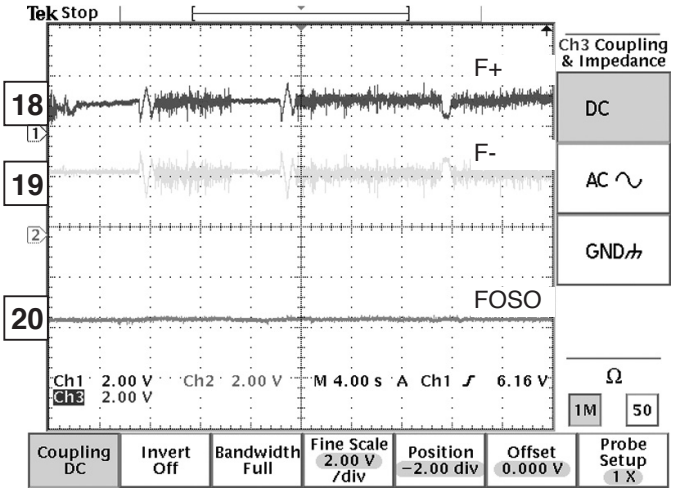


FIG 7-1 < DVD >

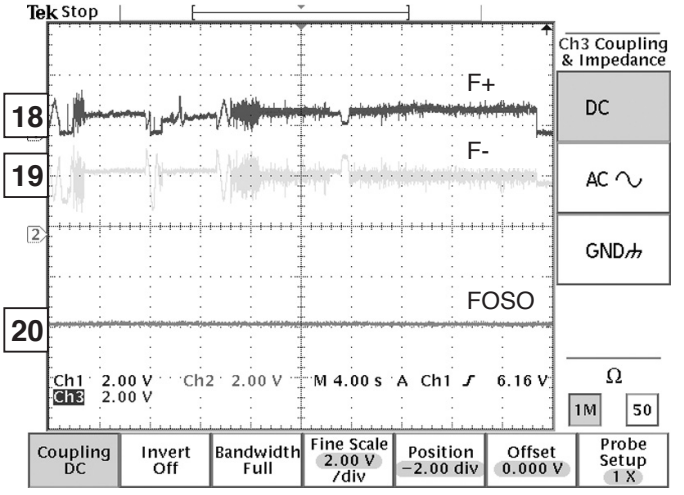
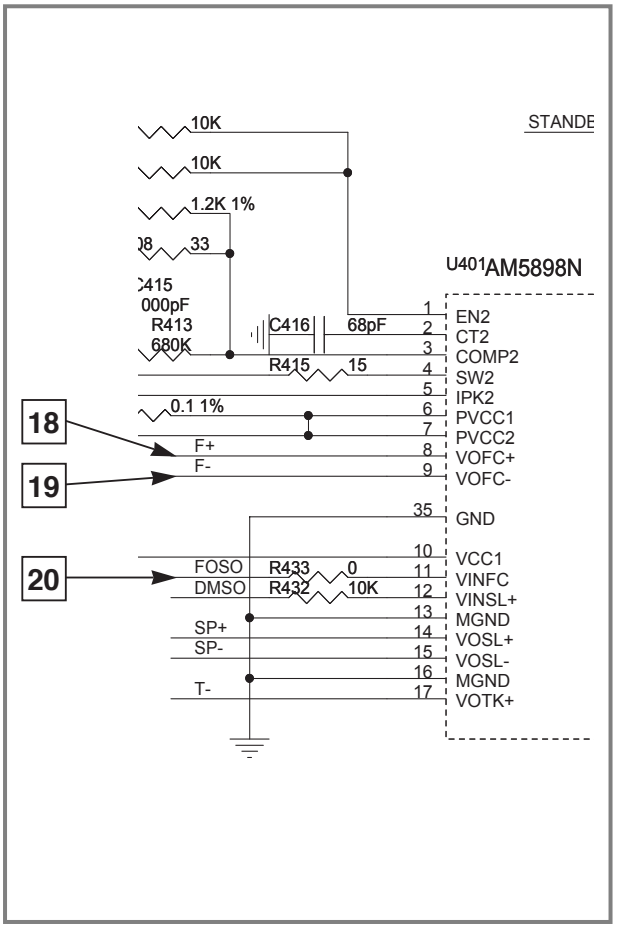


FIG 7-2 < CD >



8. TRACKING CONTROL RELATED SIGNAL(System checking)

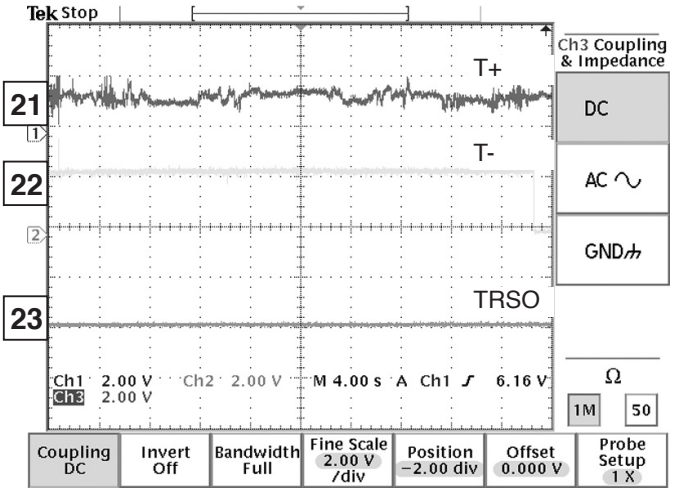


FIG 8-1 < DVD >

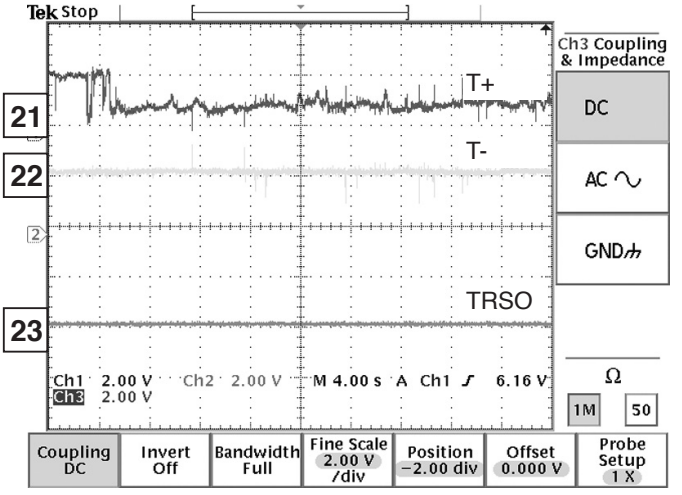
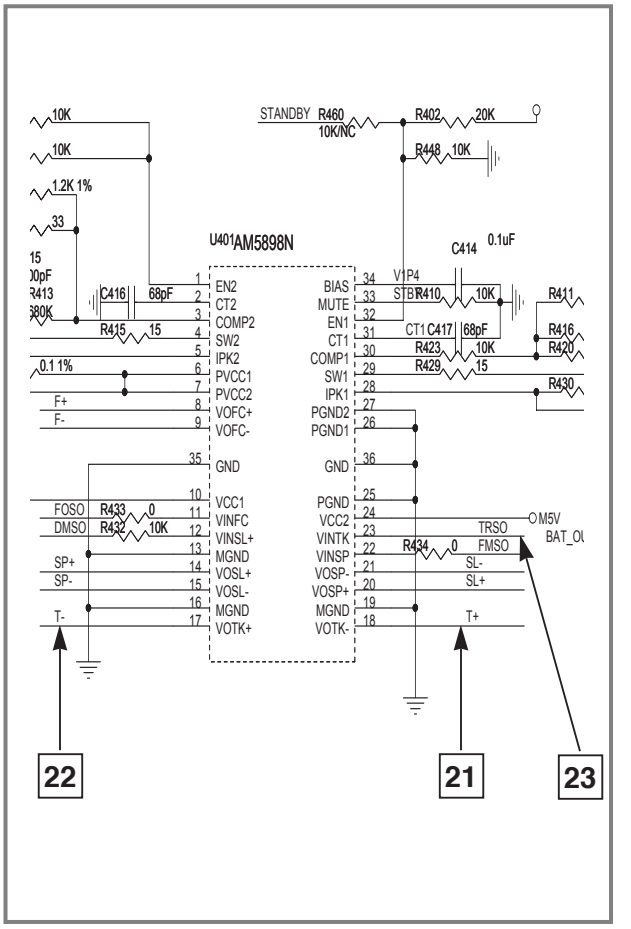
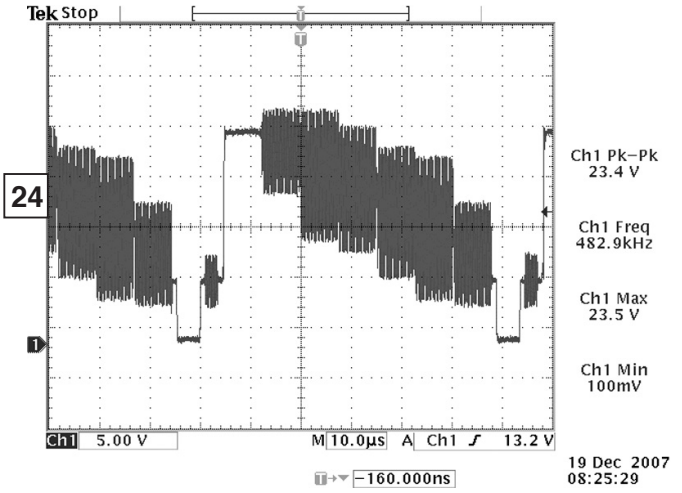


FIG 8-2 < CD >



9. 1389DE/LP VIDEO OUTPUT WAVEFORM



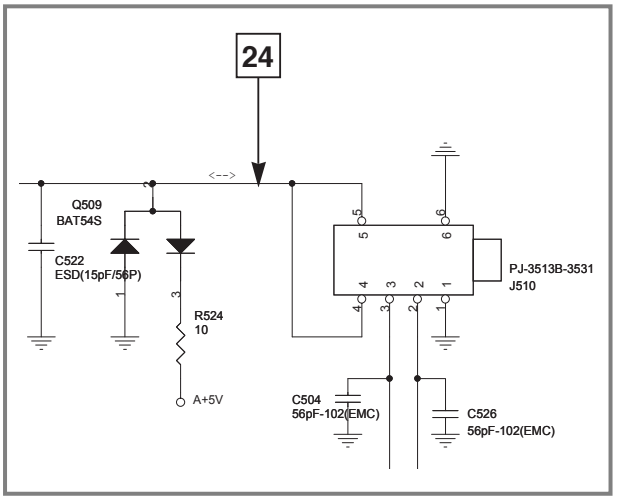
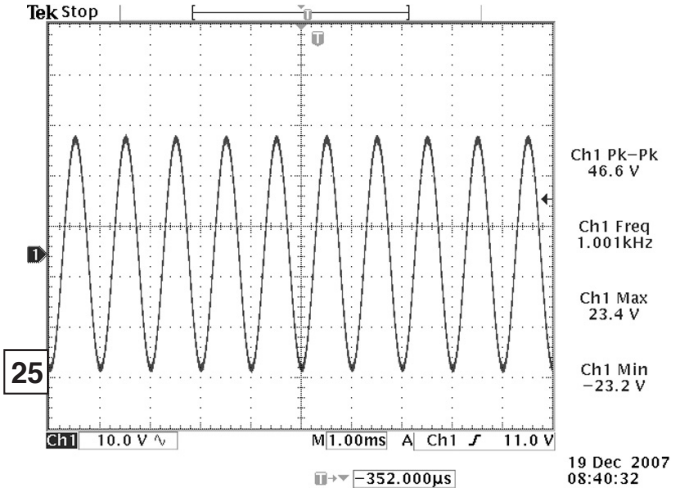


FIG 9-1

10. AUDIO OUTPUT FROM 1389DE/LP



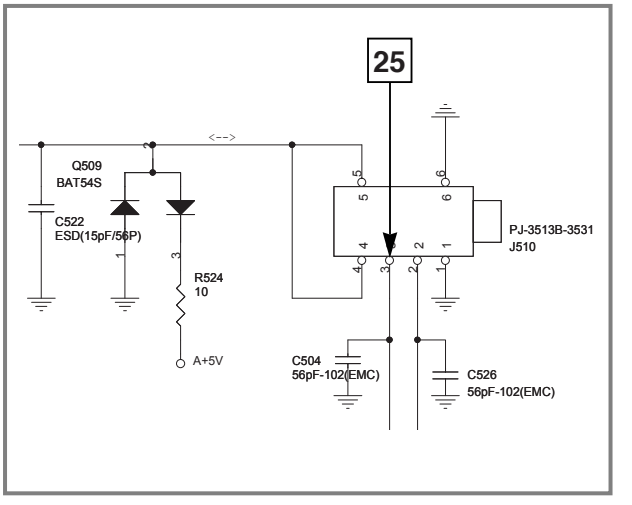
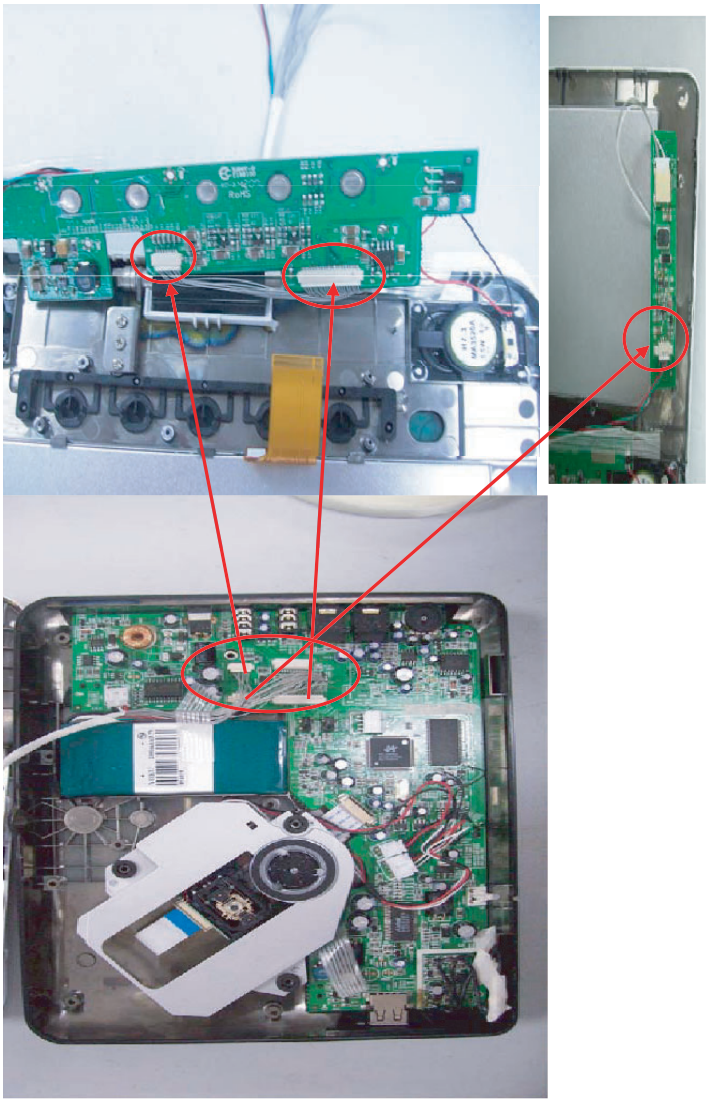


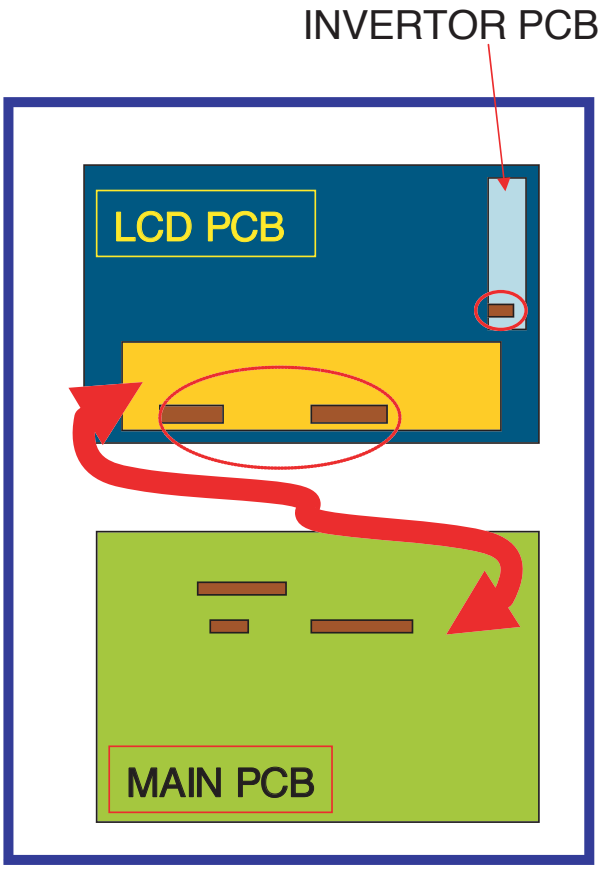
FIG 10-1

WIRING CONNECTION DIAGRAMS

1. WIRING CONNECTION DIAGRAM-1

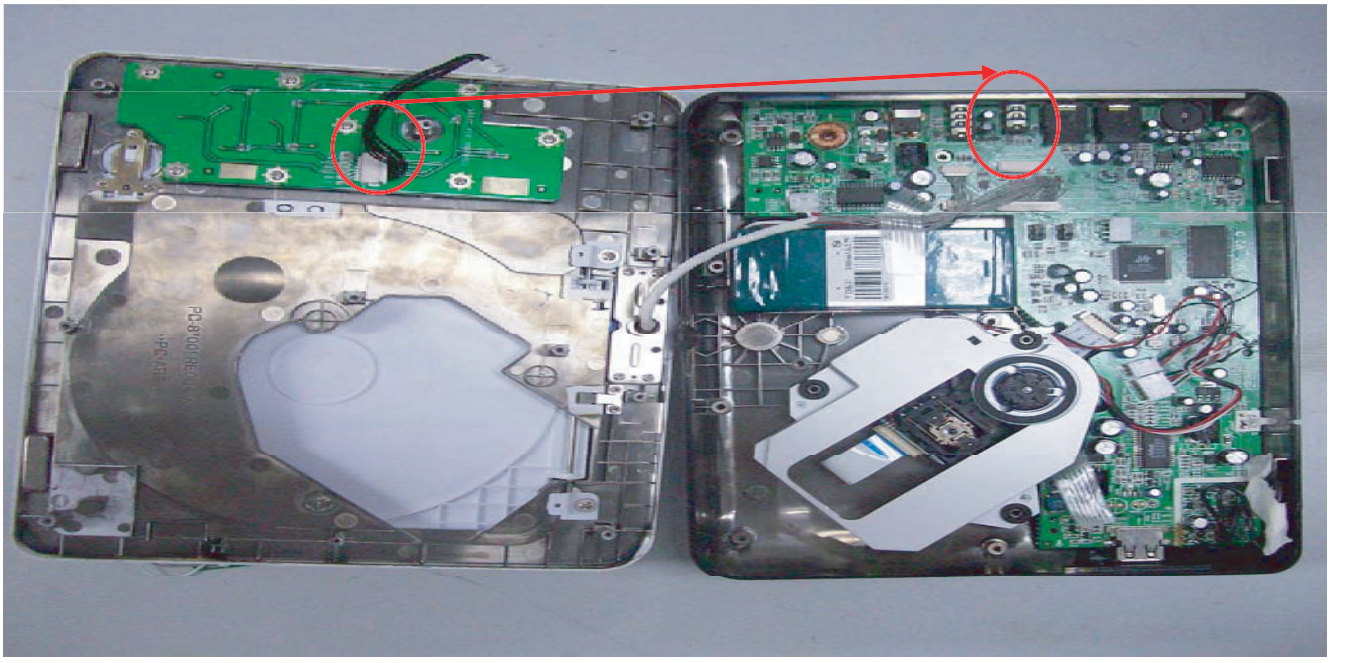
(MAIN PCB <---> LCD & INVERTOR PCB)

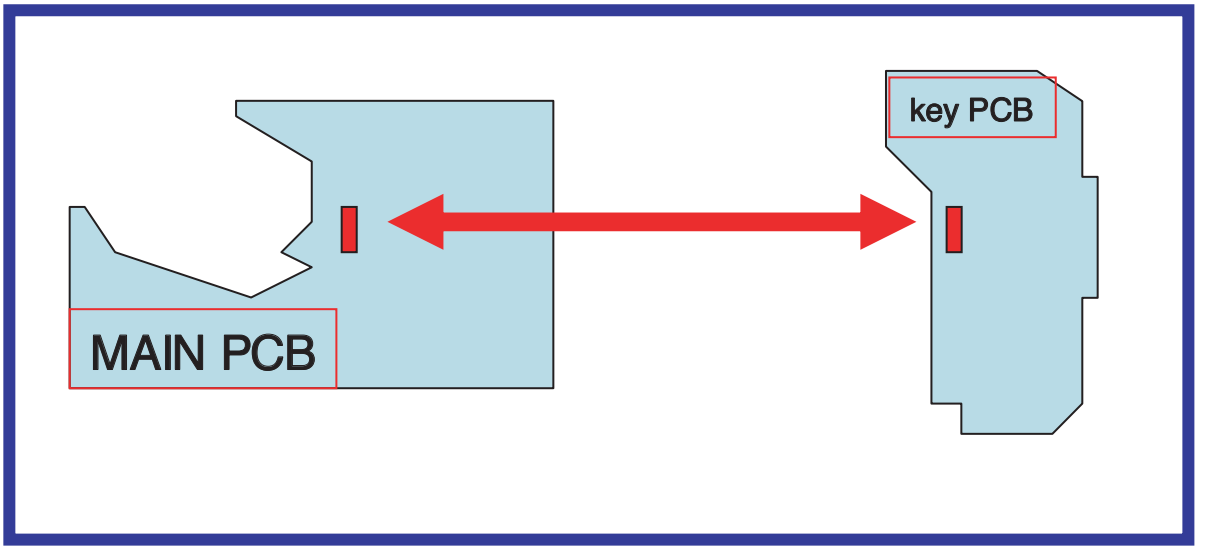




2. WIRING CONNECTION DIAGRAM-2

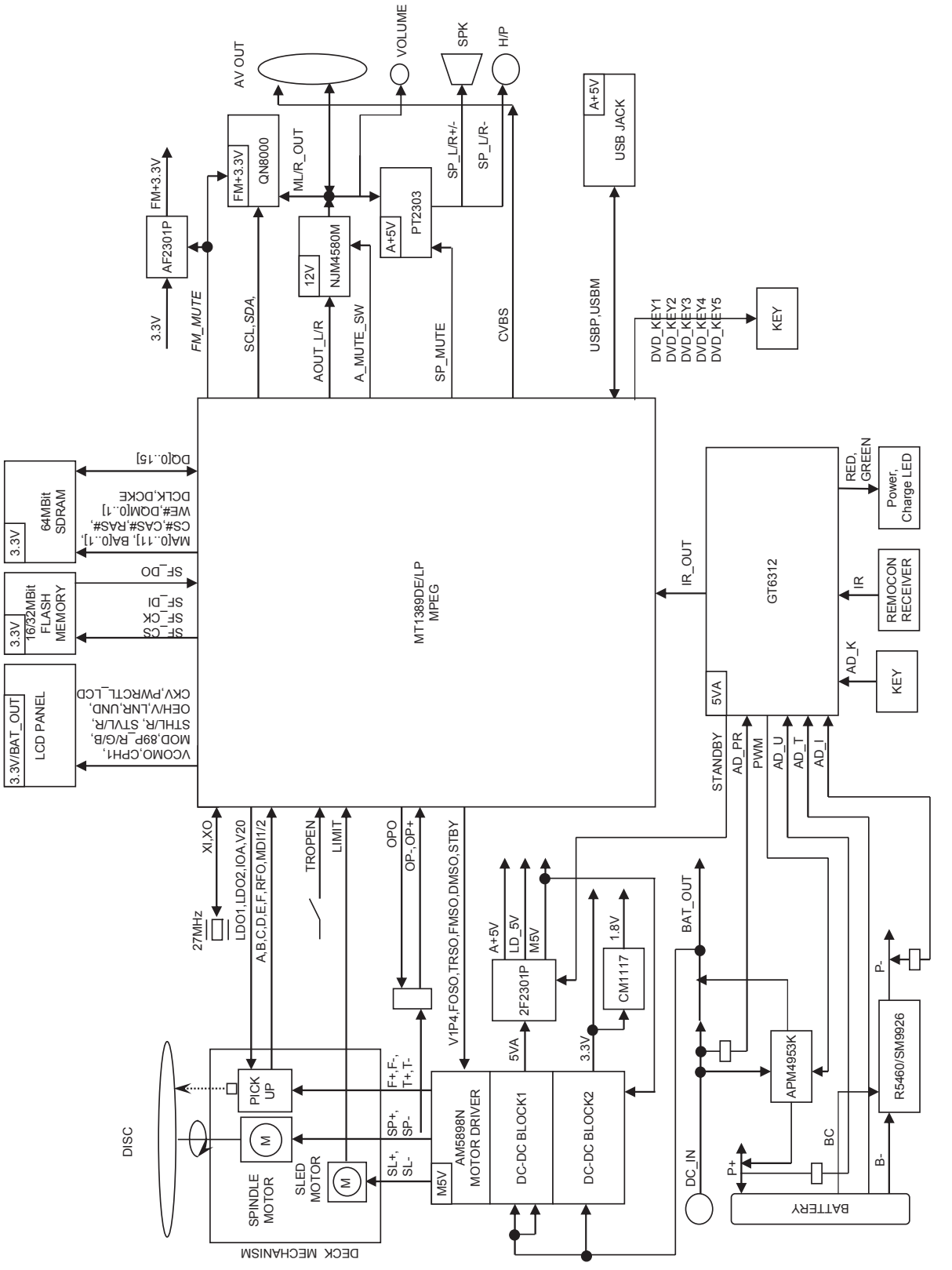
(MAIN PCB <---> KEY PCB)



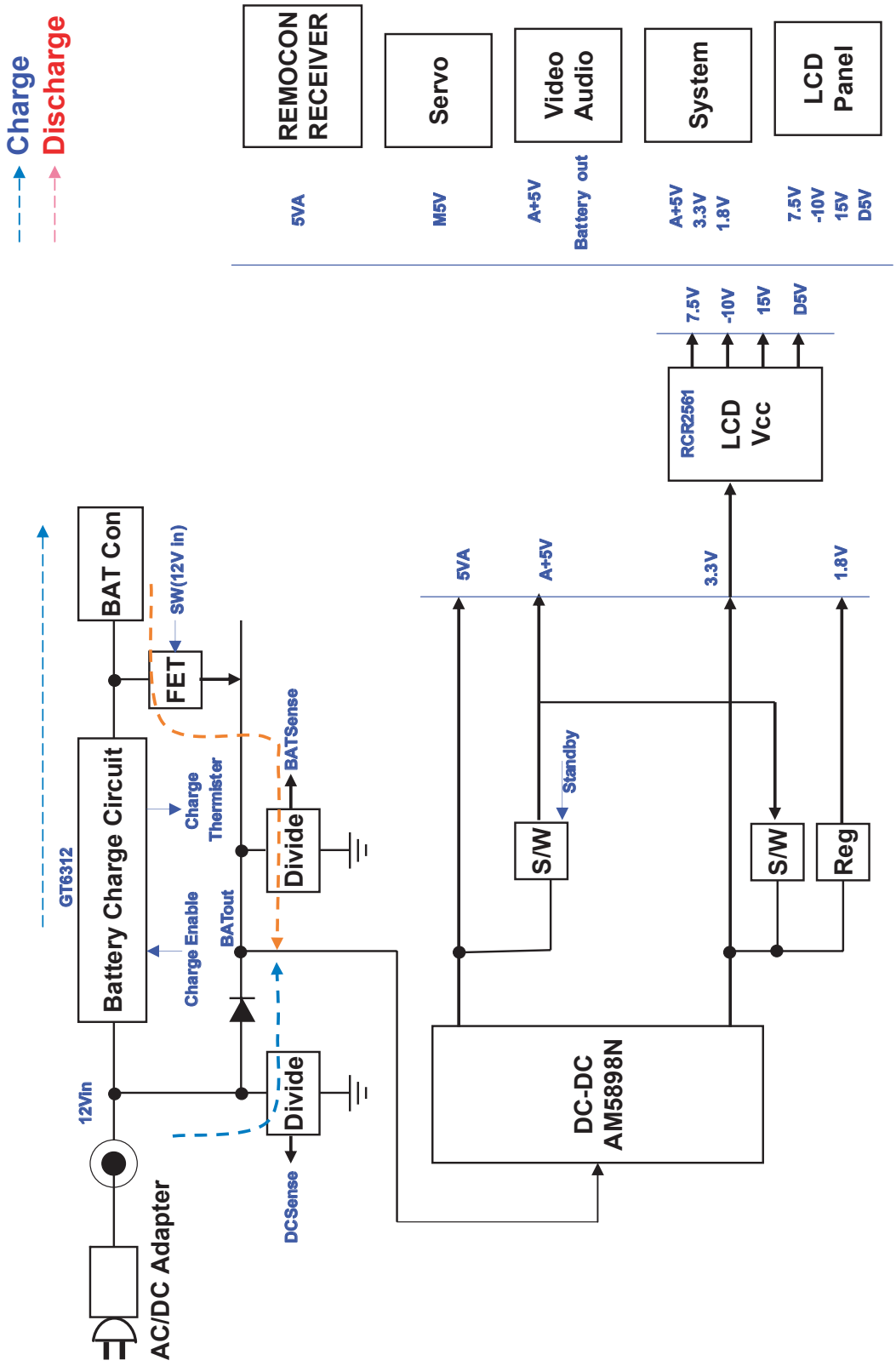


BLOCK DIAGRAMS

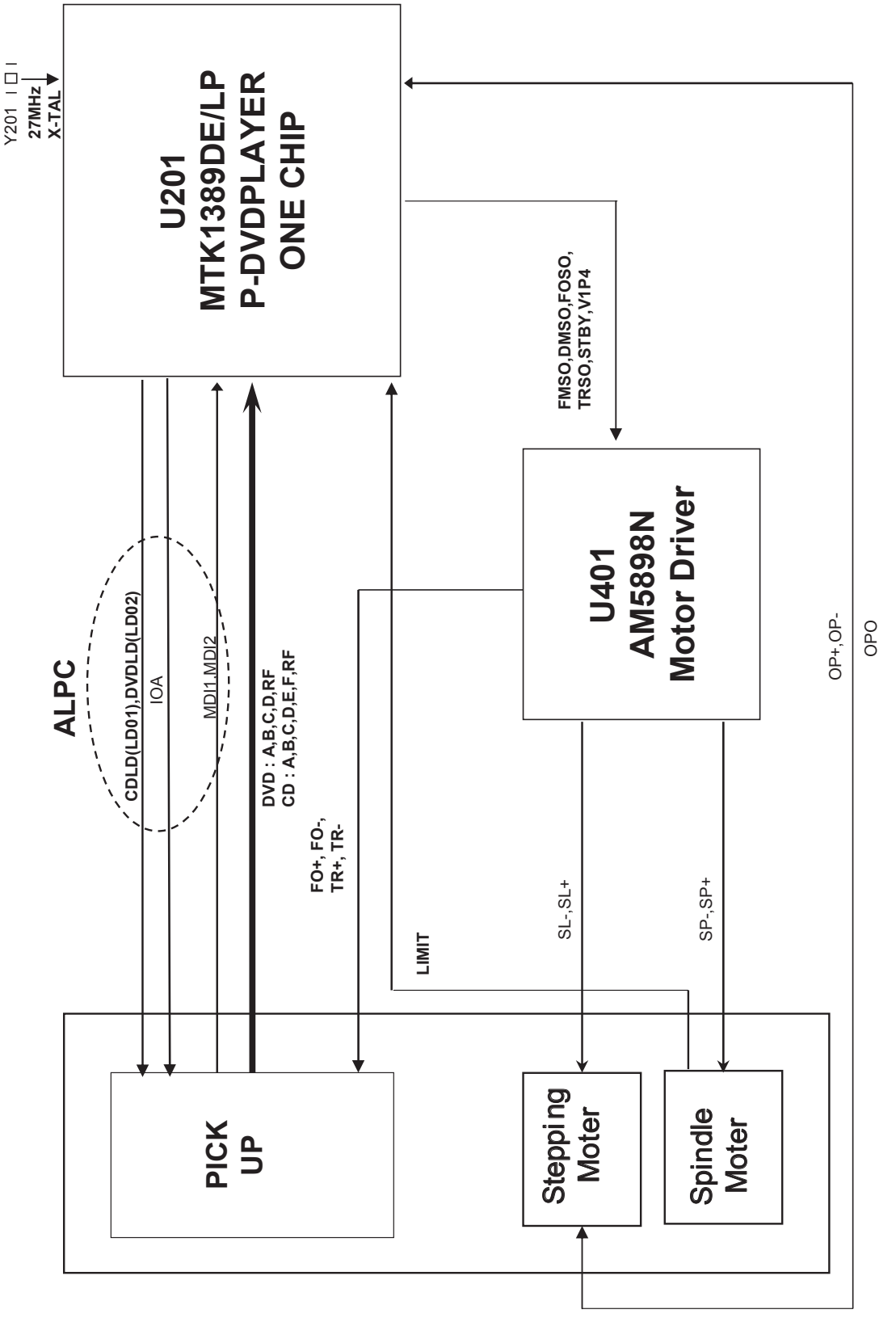
1. OVERALL BLOCK DIAGRAM



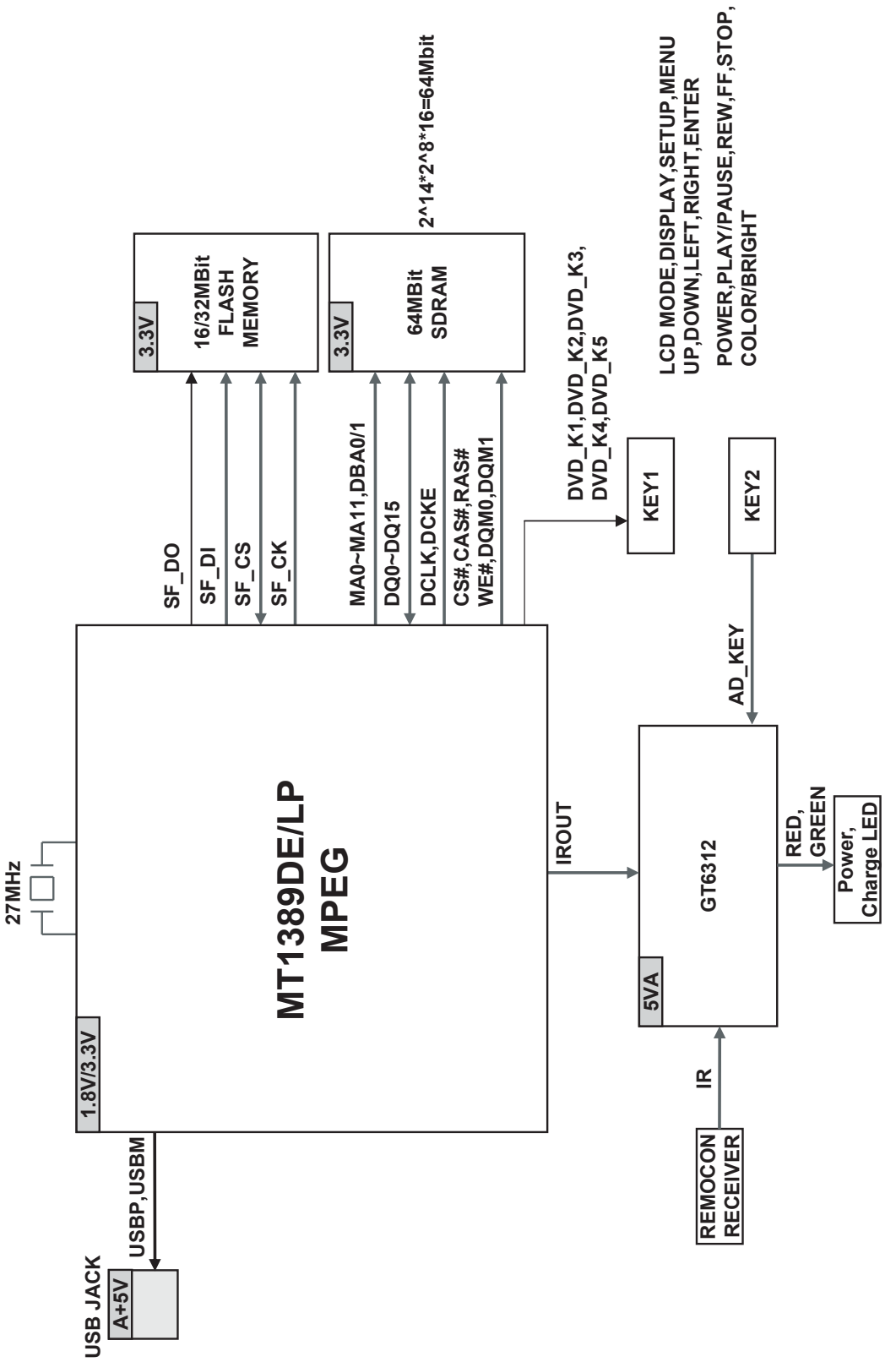
2. POWER BLOCK DIAGRAM



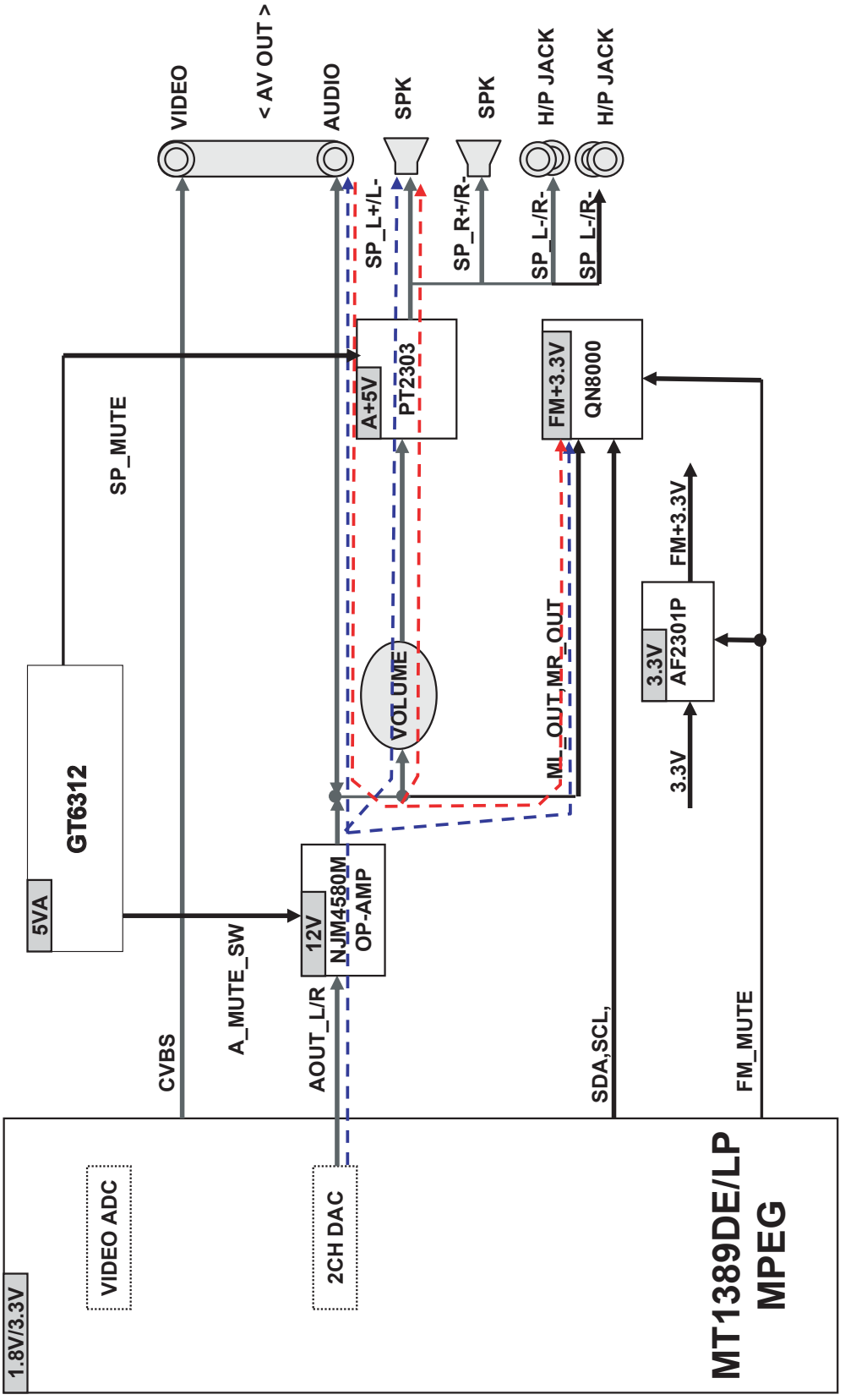
3. SERVO BLOCK DIAGRAM



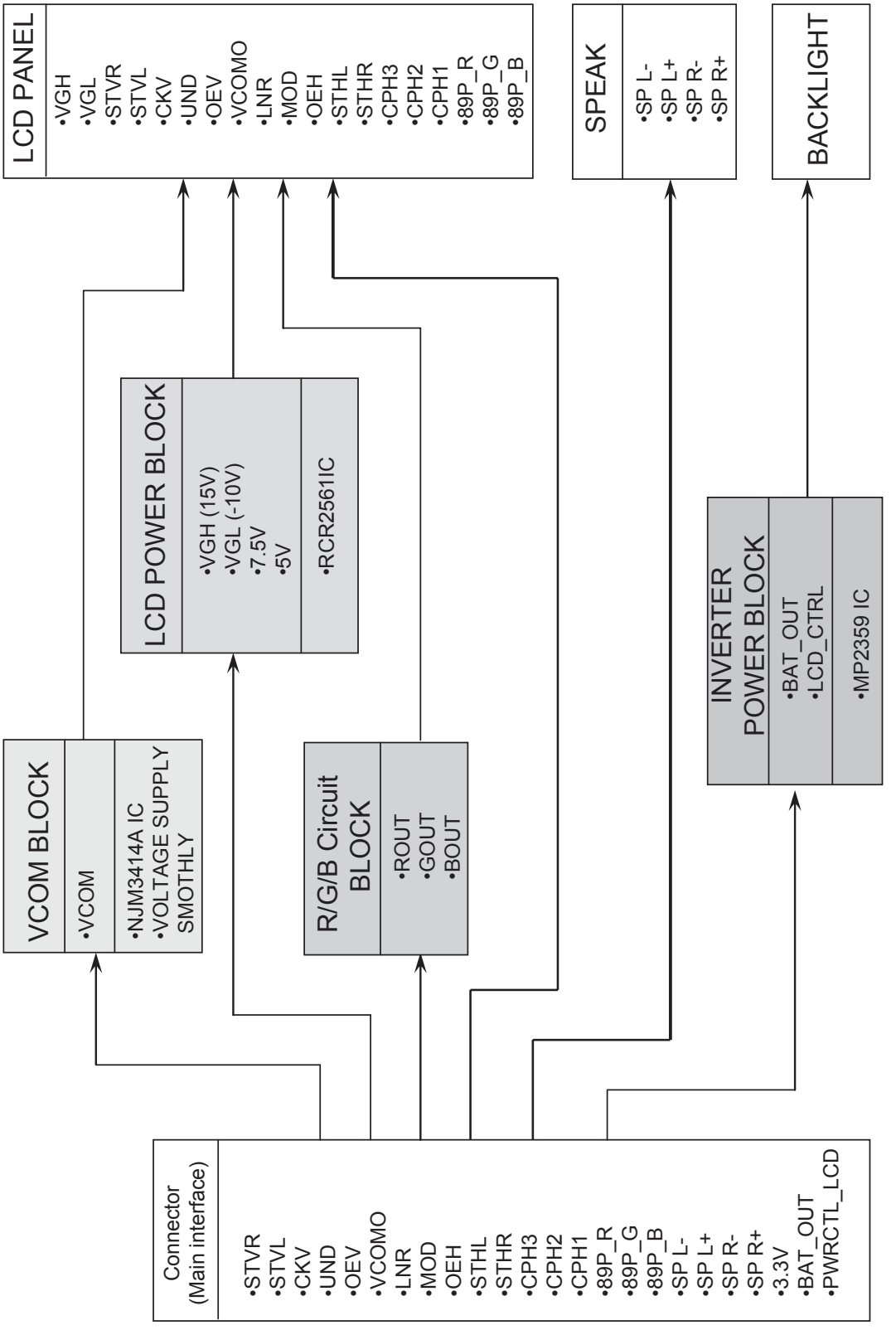
4. SYSTEM BLOCK DIAGRAM



5. AV BLOCK DIAGRAM



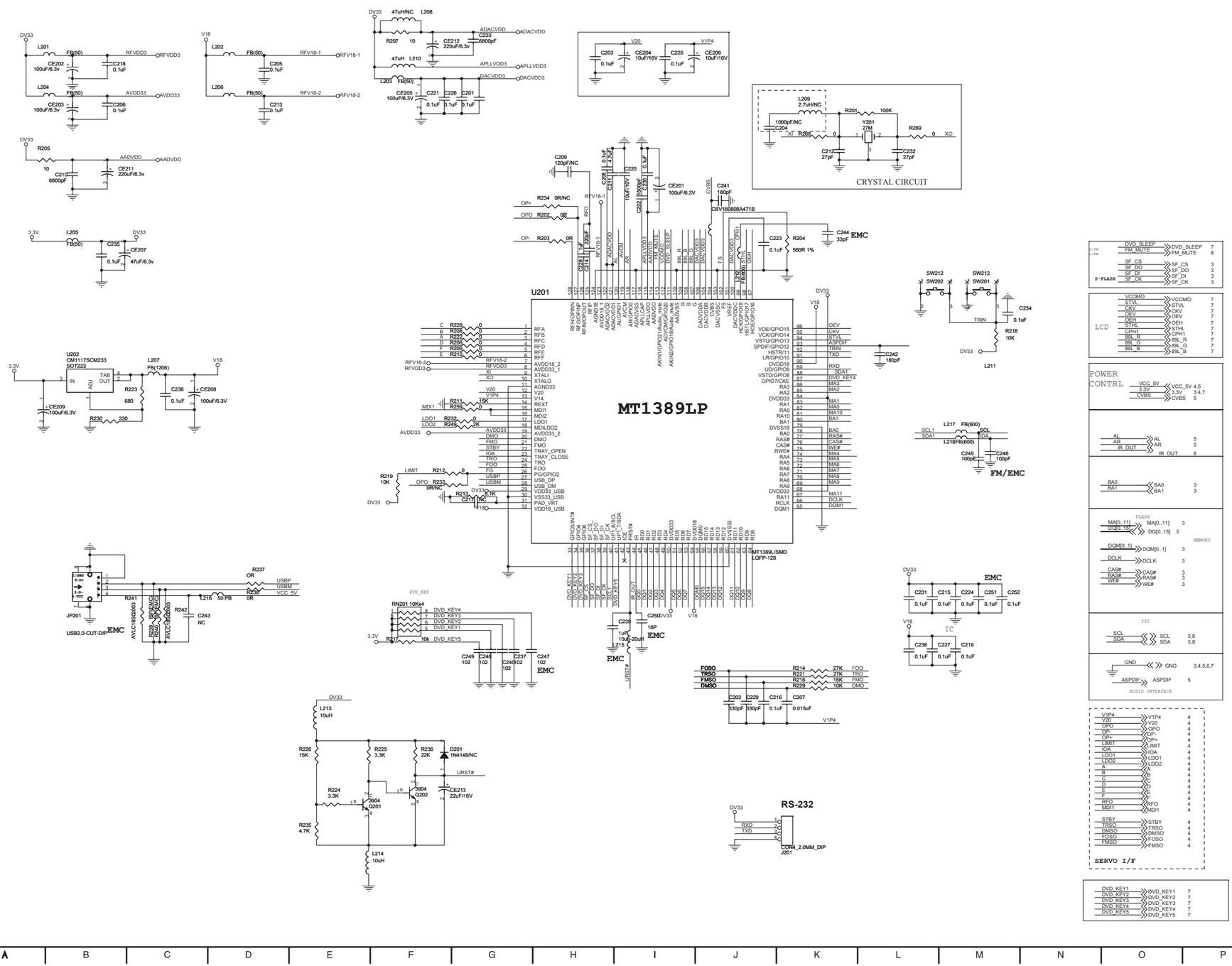
6. LCD BLOCK DIAGRAM



MEMO

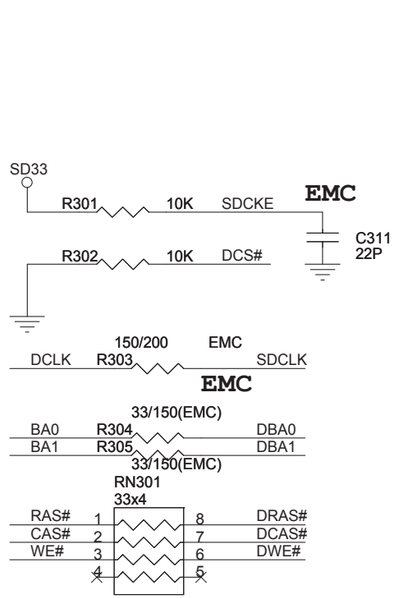
CIRCUIT DIAGRAMS

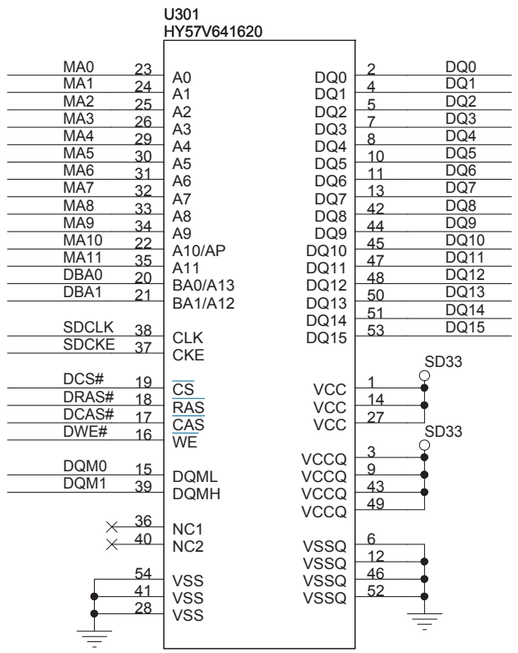
1. MPEG CIRCUIT DIAGRAM

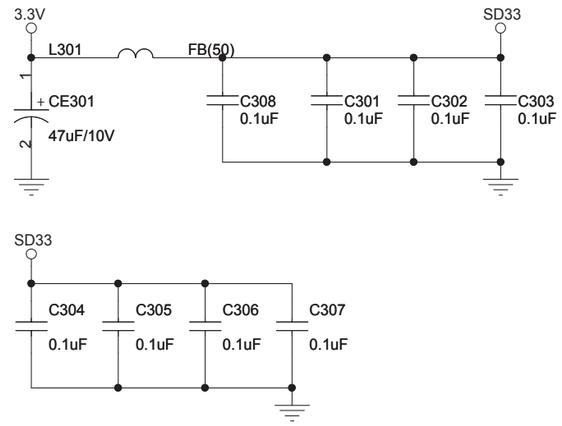


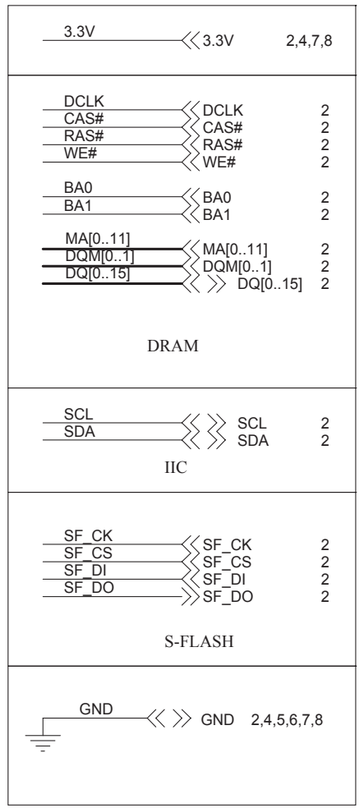
LG & MALATA
02.MPEG
Saturday, November 17, 2007

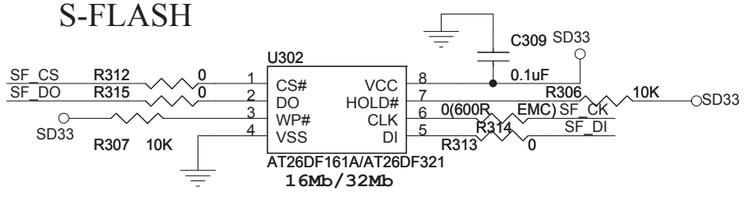
2. MEMORY CIRCUIT DIAGRAM

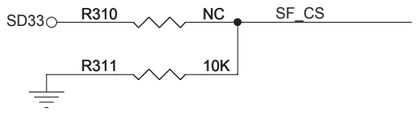


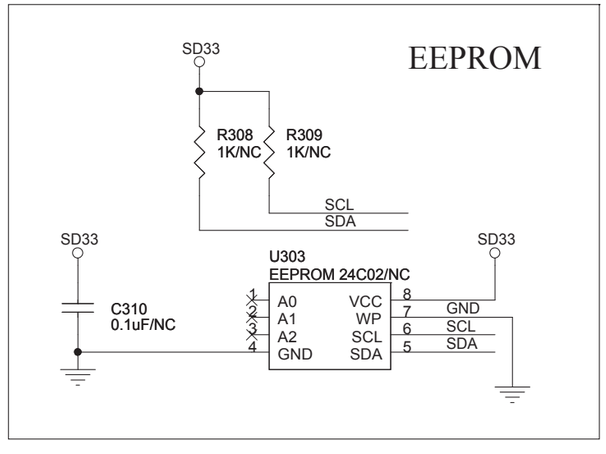






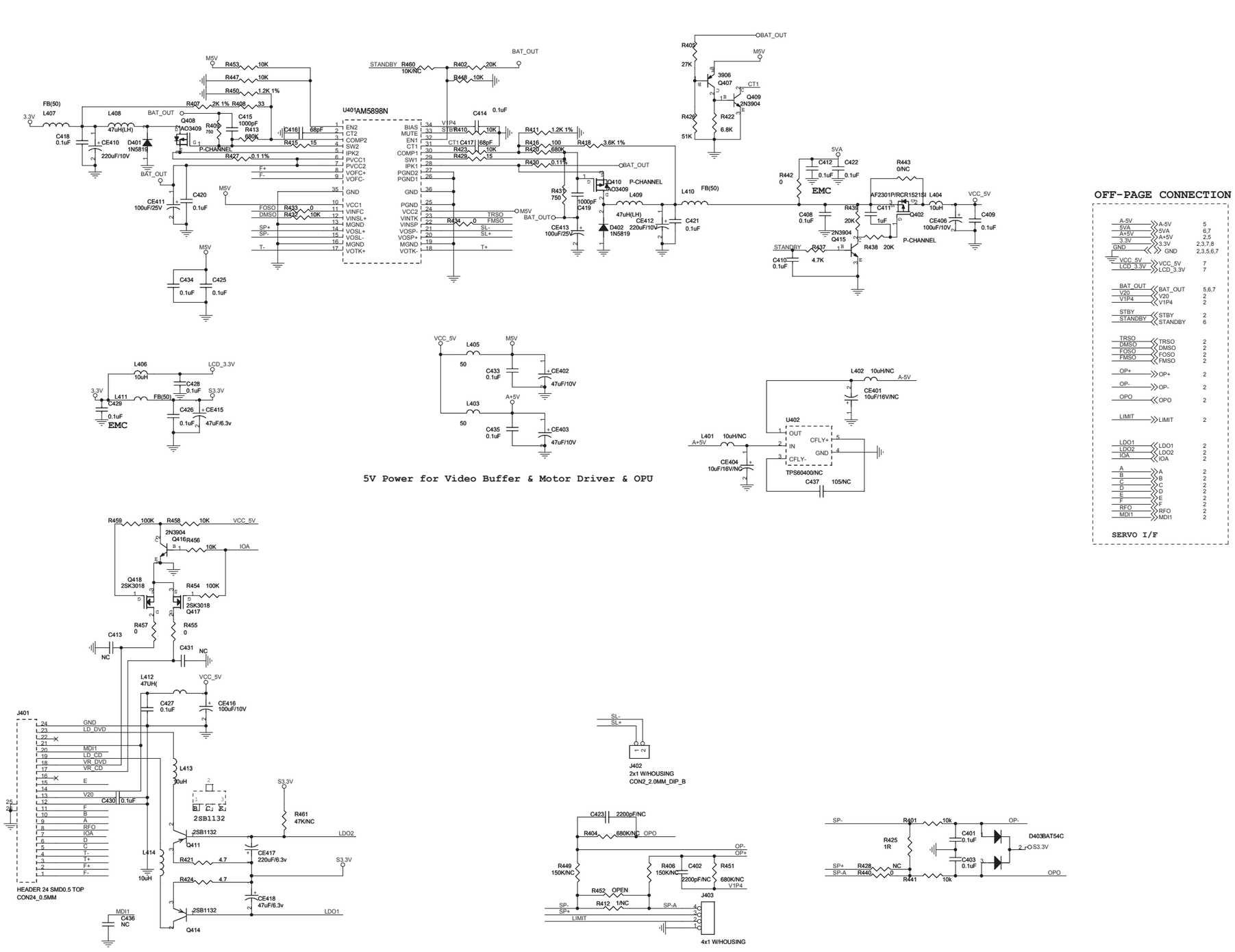




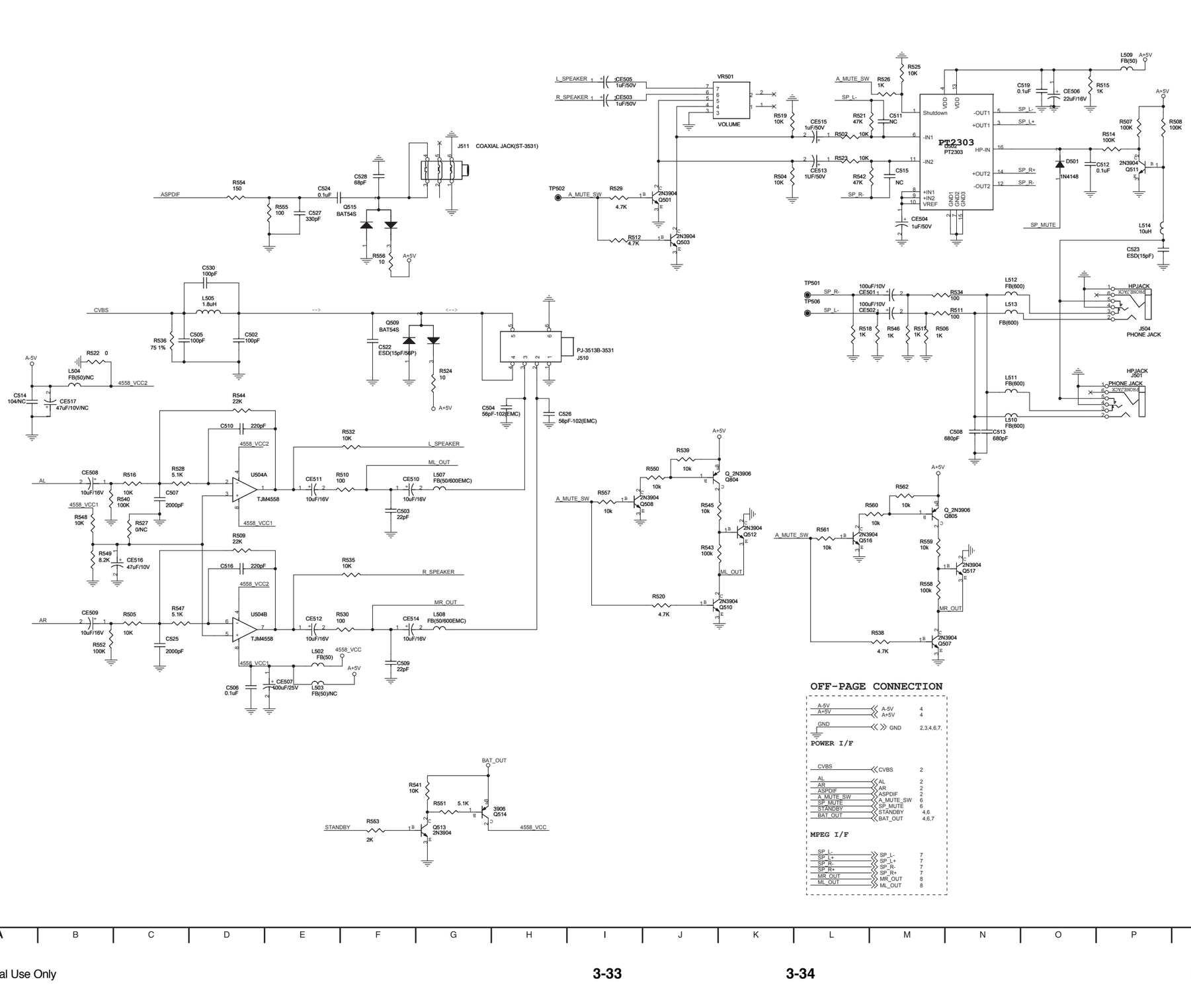


LG & MALATA
03.MEMORY
Saturday, November 17, 2007

3. OPU & MOTOR CIRCUIT DIAGRAM



4. AV CIRCUIT DIAGRAM

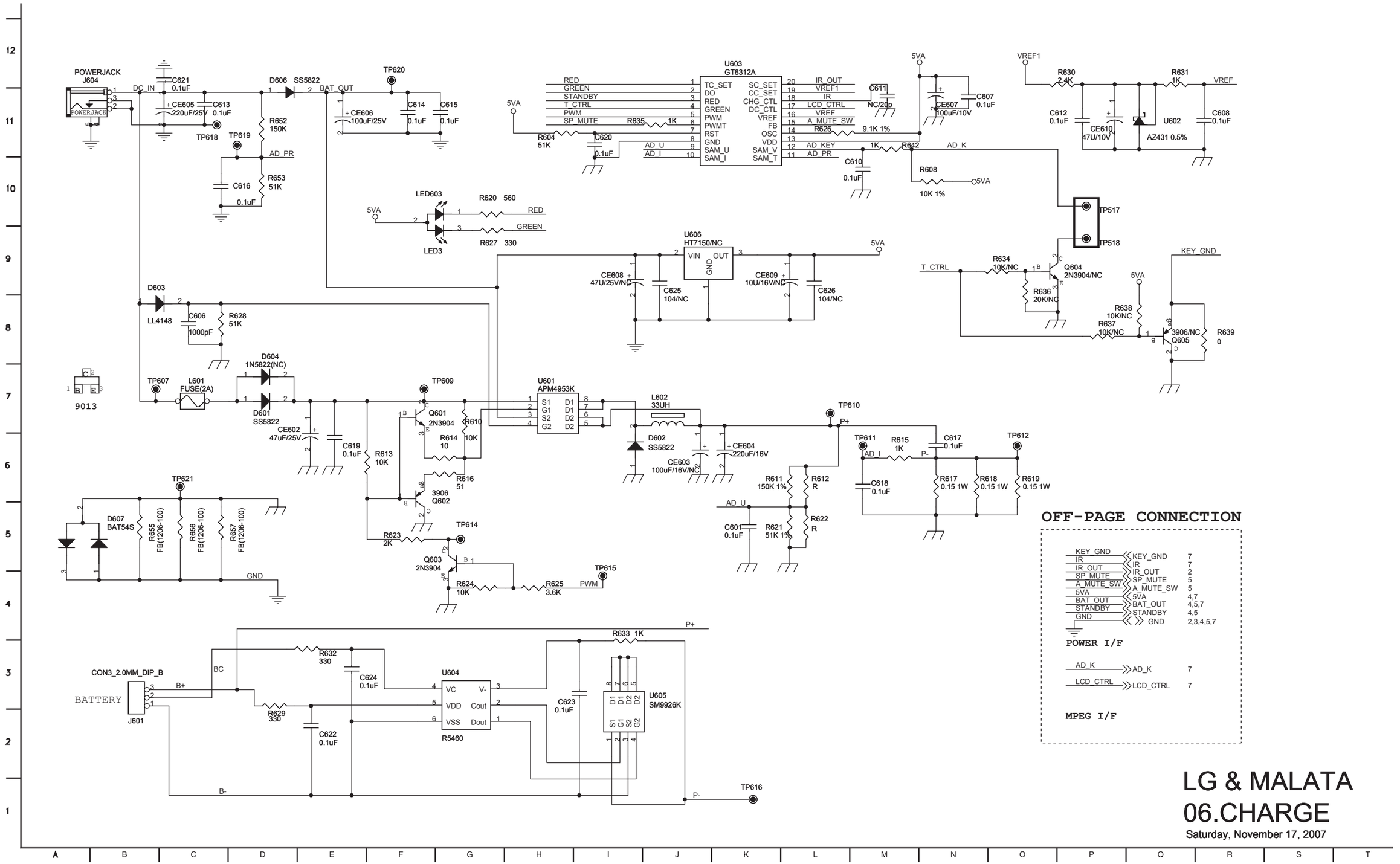


LG & MALATA

05.AV

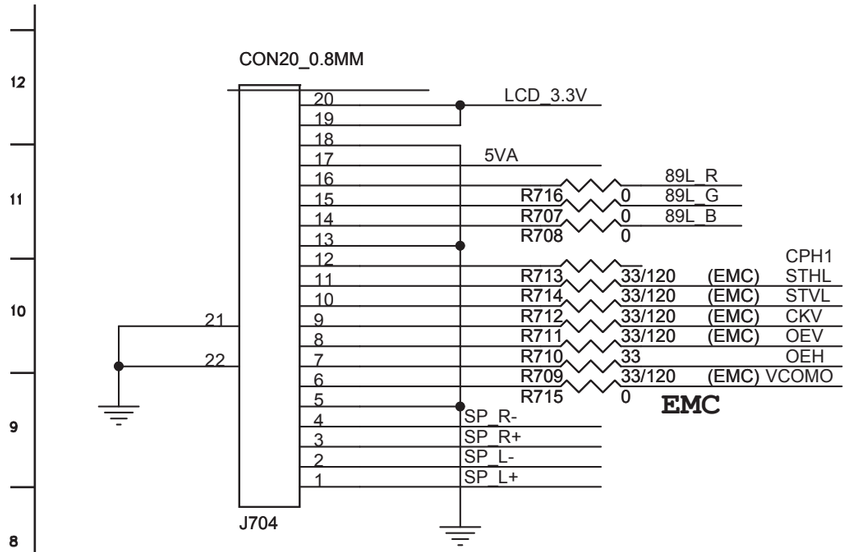
Tuesday, November 20, 2007

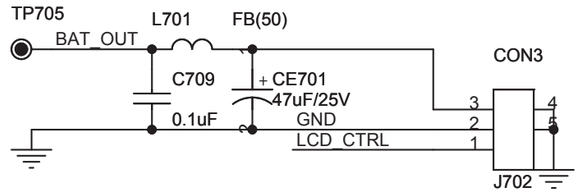
5. CHARGE CIRCUIT DIAGRAM

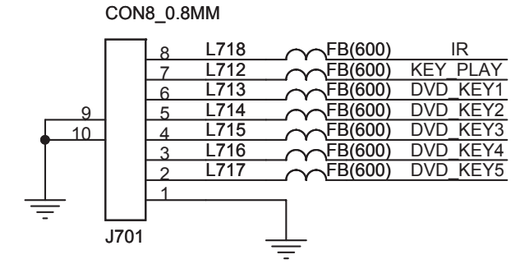


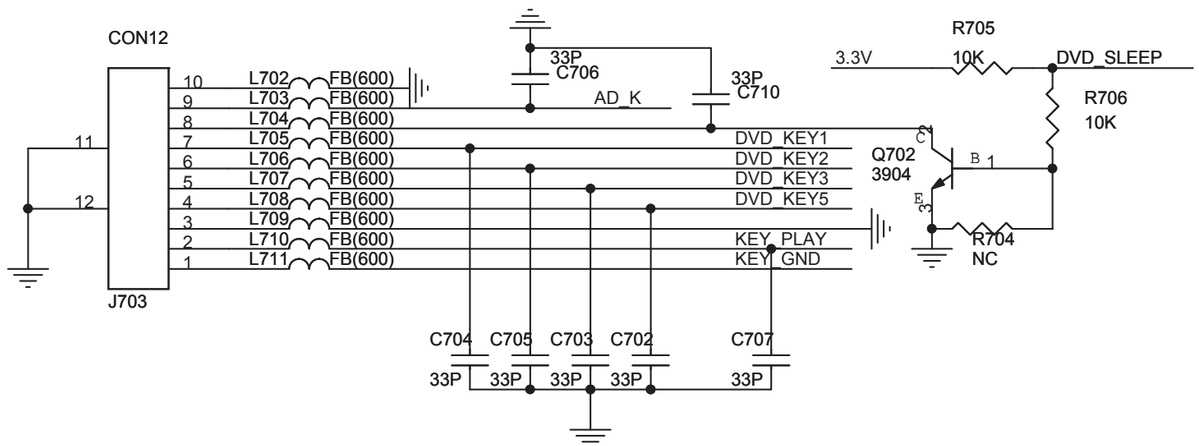
LG & MALATA
06.CHARGE
Saturday, November 17, 2007

6. LCD IF CIRCUIT DIAGRAM









OFF-PAGE CONNECTION

VCOMO	VCOMO	2	
STVL	STVL	2	
CKV	CKV	2	
OEV	OEV	2	
OEH	OEH	2	
STHL	STHL	2	
CPH1	CPH1	2	
89L_R	89L_R	2	
89L_G	89L_G	2	
89L_B	89L_B	2	
SP_L-	SP_L-	5	
SP_L+	SP_L+	5	
SP_R-	SP_R-	5	
SP_R+	SP_R+	5	

DVD_KEY1	DVD_KEY1	2	
DVD_KEY2	DVD_KEY2	2	
DVD_KEY3	DVD_KEY3	2	
DVD_KEY4	DVD_KEY4	2	
DVD_KEY5	DVD_KEY5	2	
GND	GND	2,3,4,5,6	
DVD_SLEEP	DVD_SLEEP	2	
IR	IR	6	
KEY_GND	KEY_GND	6	
BAT_OUT	BAT_OUT	4,5,6	
LCD_CTRL	LCD_CTRL	6	

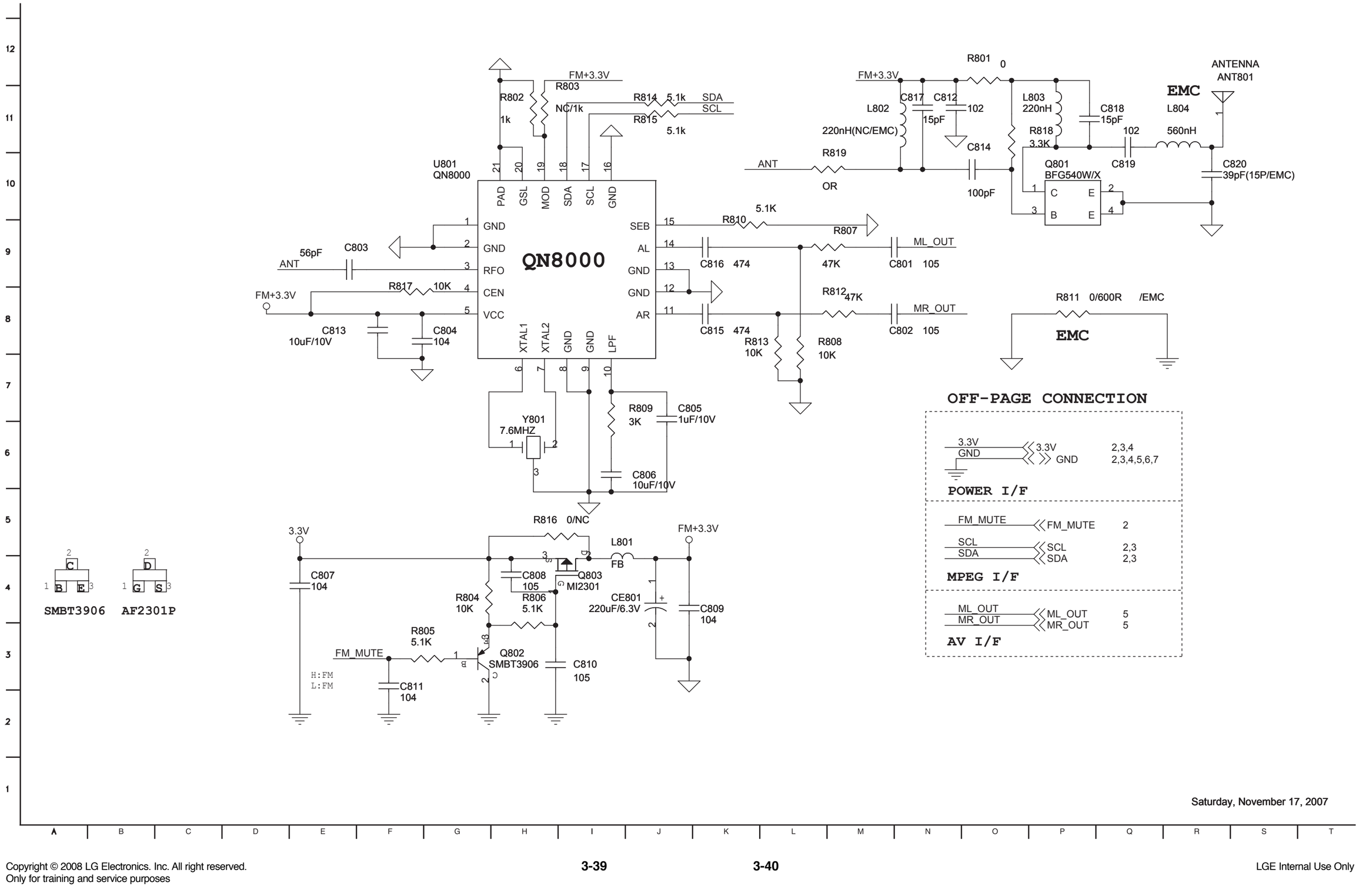
PANEL T-CON I/F

AD_K	AD_K	6
VCC_5V	VCC_5V	4
3.3V	3.3V	2,3,4
LCD_3.3V	LCD_3.3V	4
5VA	5VA	4,6

TO SERVO

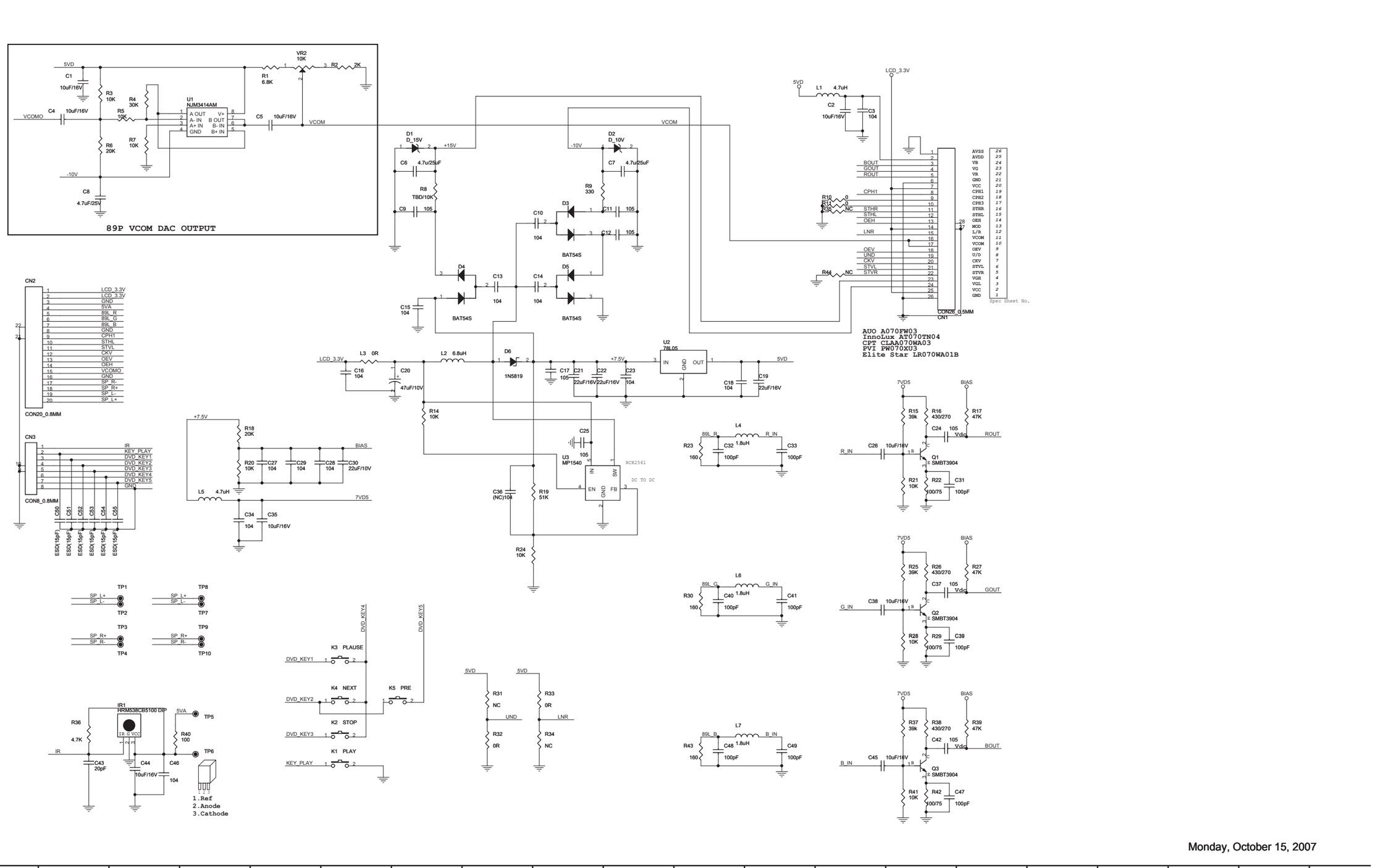
LG & MALATA
07.LCD I/F
Saturday, November 17, 2007

7. AUDIO CIRCUIT DIAGRAM



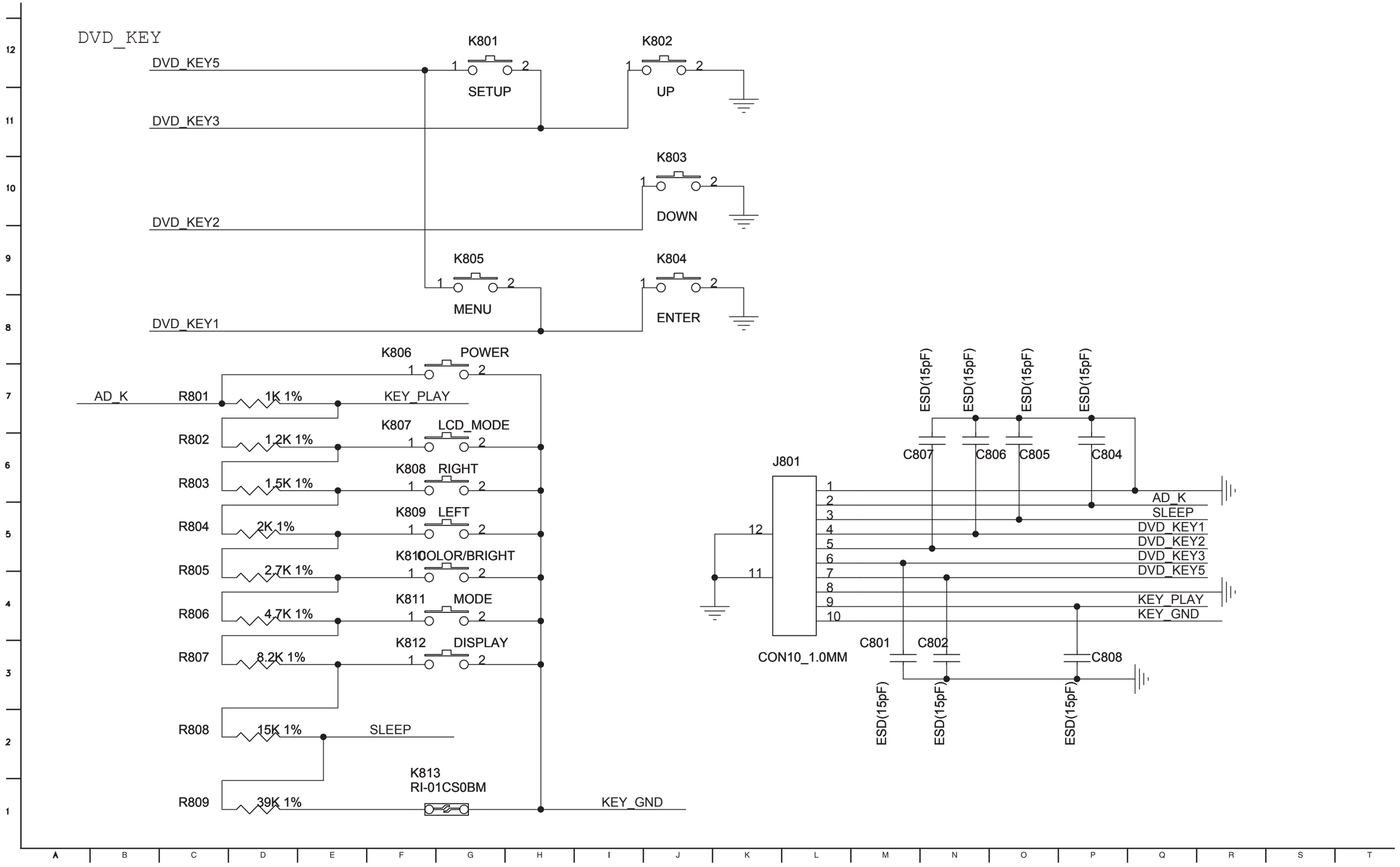
Saturday, November 17, 2007

8. KEY CIRCUIT DIAGRAM



Monday, October 15, 2007

9. LCD KEY CIRCUIT DIAGRAM



CIRCUIT VOLTAGE CHART

MODE / PIN NO.	STOP	PLAY
U1(MP2359)		
1	4.10	4.12
2	-10.78	-10.78
3	-9.61	-9.61
4	-0.05	0
5	9.91	9.88
6	-0.04	-0.04
U1(NJM3414AM)		
1	-0.29	-0.25
2	0.02	0.02
3	0.02	0.02
4	-9.49	-9.55
5	-0.29	-0.25
6	-0.29	-0.26
7	-0.29	-0.26
8	5.06	5.06
U2(78L05)		
1	5.06	5.06
2	0.02	0.02
3	7.56	7.56
U201(MT1389LP)		
1	2.01	2.21
2	2.01	2.23
3	2.01	2.22
4	2.01	2.19
5	2.04	2.59
6	2.04	2.62
7	1.87	1.87
8	3.33	3.33
9	0.92	0.94
10	0.87	0.92
11	0	0
12	2.02	2.02
13	1.41	1.41
14	0.59	0.59
15	0.12	0.18
16	0.12	0.18
17	3.33	2.51
18	3.33	3.33
19	3.33	3.33
20	1.41	1.94
21	1.41	1.32
22	0.01	3.26
23	1.96	3.27
24	1.41	1.40
25	1.38	1.31
26	3.33	3.33
27	0.02	0.01
28	0.02	0.01
29	4.87	3.33
30	0	0
31	0	0.01
32	1.87	1.87
33	3.31	3.32
34	2.92	2.92
35	2.92	2.92
36	3.30	0.24

MODE / PIN NO.	STOP	PLAY
37	0.01	1.45
38	0.01	1.01
39	0.01	1.22
40	3.31	3.31
41	3.32	3.32
42	0.01	0
43	3.32	3.33
44	5.06	5.02
45	0.97	1.16
46	1.17	1.02
47	0.85	1.08
48	1.19	1.11
49	0.81	1.11
50	3.33	3.33
51	0.65	0.97
52	0.71	0.88
53	0.84	1.09
54	1.87	1.87
55	2.55	2.39
56	0.63	1.05
57	1.27	1.38
58	1.26	1.53
59	1.02	1.87
60	0	0
61	1.06	1.17
62	0.87	0
63	0.97	1.08
64	0.91	1.19
65	2.82	2.40
66	1.60	1.57
67	0	0.04
68	3.33	3.33
69	0.05	0.08
70	0.05	0.06
71	1.12	1.14
72	1.59	1.30
73	1.52	1.68
74	1.04	1.47
75	3.28	3.23
76	3.06	0
77	3.22	3.16
78	1.01	1.56
79	0	0
80	1.07	1.86
81	0.02	0.04
82	0	0.38
83	1.07	2.35
84	3.33	3.33
85	1.04	2.28
86	1.04	1.56
87	2.88	2.88
88	2.93	2.93
89	3.31	3.31
90	1.87	1.87
91	3.31	3.31
92	2.94	0
93	1.14	1.13

MODE / PIN NO.	STOP	PLAY
94	0.03	0.04
95	0.22	0
96	3.20	3.20
97	0.07	0.07
98	0.02	0.02
99	1.43	1.44
100	3.32	3.33
101	0.01	0.01
102	0	1.23
103	0	0
104	0.97	1.12
105	3.32	3.33
106	3.32	3.33
107	0.6	0.60
108	0.6	0.60
109	0.6	0.60
110	0	0
111	1.72	1.72
112	1.30	1.30
113	3.31	3.33
114	3.33	3.33
115	3.32	3.32
116	1.2	1.21
117	0	0
118	1.62	1.63
119	1.54	1.61
120	1.58	1.56
1121	3.26	3.26
122	3.26	3.26
123	1.87	1.86
124	0	0
125	0.99	0.99
126	0.99	0.99
127	2.41	1.64
128	2.41	1.59
U202(AZ1117H-ADJ)		
1	0.63	0.63
2	1.89	1.89
3	3.34	3.34
4	1.89	1.89
U3(MP1540)		
1	2.87	2.89
2	0.02	0.02
3	1.26	1.26
4	3.00	3.01
5	3.00	3.01
U301(HY57V641620ETP		
1	3.33	3.33
2	1.08	1.13
3	3.33	3.33
4	1.03	1.10
5	1.17	1.01
6	0	0
7	1.52	1.08
8	0.53	1.11
9	3.33	3.33
10	0.50	0.98

MODE / PIN NO.	STOP	PLAY
11	0.46	0.88
12	0	0
13	1.29	1.09
14	3.33	3.33
15	2.82	2.40
16	3.28	3.23
17	3.08	2.94
18	3.23	3.16
19	0.01	0.01
20	1.01	1.60
21	1.07	1.85
22	0.02	0.04
23	0.21	0.37
24	1.06	2.37
25	1.04	2.27
26	1.04	1.58
27	3.33	3.33
28	0	0
29	1.05	1.48
30	1.52	0
31	1.59	0
32	1.12	1.12
33	0.05	0.06
34	0.05	0.08
35	0.01	0.04
36	0.01	0
37	3.33	3.33
38	1.60	1.60
39	2.82	2.40
40	0	0
41	0	0
42	0.92	1.19
43	3.33	3.33
44	0.99	1.07
45	0.89	1.12
46	0	0
47	1.07	1.17
48	1.03	1.38
49	3.33	0
50	0	1.55
51	1.64	1.37
52	0	0
53	0.1	1.04
54	0	0
IC302(AT26DF161A)		
1	3.30	0.16
2	0.01	1.47
3	3.33	3.33
4	0	0
5	0.01	0.95
6	0.01	1.20
7	3.33	3.33
8	3.33	3.33
U401(AM5898N)		
1	0	2.40
2	1.29	1.28
3	1.26	1.27

MODE / PIN NO.	STOP	PLAY
4	0.01	0
5	9.92	9.89
6	9.94	9.91
7	9.94	9.91
8	0	2.21
9	2.43	2.57
10	5.07	4.95
11	1.40	1.38
12	1.40	1.57
13	0	0
14	2.42	3.27
15	2.42	1.55
16	0	0
17	2.44	2.35
18	2.44	2.42
19	0	0
20	2.44	2.31
21	2.44	2.55
22	1.40	1.38
23	1.40	1.40
24	5.06	4.95
25	0	0
26	0	0
27	0	0
28	9.94	9.88
29	7.51	4.78
30	1.30	1.25
31	1.31	1.30
32	3.14	3.14
33	0	3.26
34	1.41	1.41
35	0	0
36	0	0
U502(PT2303Y)		
1	0	0
2	0	0
3	2.43	2.36
4	5.06	4.93
5	2.43	2.36
6	2.43	2.36
7	0	0
8	2.43	2.36
9	2.41	2.36
10	2.41	2.35
11	2.43	2.37
12	2.43	2.37
13	5.06	4.93
14	2.43	2.37
15	0	0
16	0	0.03
U504(TJM4558)		
1	5.63	5.61
2	4.52	4.50
3	4.52	4.50
4	0	0
5	4.52	4.50
6	4.52	4.50

MODE / PIN NO.	STOP	PLAY
7	5.63	5.61
8	9.92	9.89
U601(APM4953KC)		
1	10.27	10.25
2	10.27	10.25
3	9.95	9.92
4	9.78	9.76
5	0	0
6	0	0
7	0	0
8	0	0
U603(GT6312)		
1	5.06	5.01
2	5.05	5.01
3	4.95	4.91
4	0	0
5	0	0
6	0	0
7	5.05	5.01
8	0	0
9	0	0
10	0	0
11	2.62	2.62
12	5.06	5.03
13	0	5.03
14	4.62	4.58
15	0	0
16	0	2.51
17	5.05	5..01
18	4.97	4.93
19	5.02	4.98
20	0	5.01
U604(R5460N208AA)		
1	0.04	0.04
2	0.04	0.04
3	0	0
4	0	0
5	0	0
6	0	0
U605(SM9926K)		
1	0	0
2	0.03	0.04
3	0	0
4	0.04	0.04
5	0.3	0.3
6	0.3	0.3
7	0.3	0.3
8	0.3	0.3

MODE / PIN NO.	STOP	PLAY
CE201		
+	3.33	3.33
-	0	0
CE202		
+	3.33	3.33
-	0	0
CE203		
+	3.33	3.33
-	0	0
CE204		
+	2.10	2.00
-	0	0
CE205		
+	3.33	3.33
-	0	0
CE206		
+	1.41	1.40
-	0	0
CE207		
+	3.33	3.32
-	0	0
CE208		
+	1.87	1.87
-	0	0
CE209		
+	3.33	3.33
-	0	0
CE211		
+	3.33	3.32
-	0	0
CE212		
+	3.26	3.26
-	0	0
CE213		
+	3.33	3.33
-	0	0
CE301		
+	3.33	3.33
-	0	0
CE402		
+	5.07	4.98
-	0	0
CE403		
+	5.07	5.00
-	0	0
CE406		
+	5.06	5.00
-	0	0
CE410		
+	3.39	3.38
-	0	0
CE411		
+	9.80	9.71
-	0	0

MODE / PIN NO.	STOP	PLAY
CE412		
+	5.06	5.04
-	0	0
CE413		
+	9.80	9.71
-	0	0
CE415		
+	3.37	3.36
-	0	0
CE416		
+	5.15	4.99
-	0	0
CE417		
+	3.34	3.33
-	3.34	3.33
CE418		
+	3.34	3.33
-	3.34	3.33
CE501		
+	2.45	2.40
-	0	0
CE502		
+	2.45	2.40
-	0	0
CE503		
+	5.37	5.30
-	0	0
CE504		
+	2.46	2.36
-	0	0
CE505		
+	5.37	5.30
-	0	0
CE506		
+	5.06	5.00
-	0	0
CE507		
+	9.78	9.71
-	0	0
CE508		
+	4.05	4.02
-	1.63	1.63
CE509		
+	4.05	4.04
-	1.63	1.63
CE510		
+	1.65	1.50
-	0	0
CE511		
+	5.38	5.30
-	0	0
CE512		
+	5.55	5.50
-	0	0
CE513		

MODE / PIN NO.	STOP	PLAY
+	2.48	2.39
-	0	0
CE514		
+	1.89	1.80
-	0	0
CE515		
+	2.47	2.40
-	0	0
CE516		
+	4.45	4.41
-	0	0
CE602		
+	10.13	10.08
-	0	0
CE604		
+	8.40	8.40
-	0	0
CE605		
+	10.14	10.08
-	0	0
CE606		
+	9.80	9.71
-	0	0
CE607		
+	5.06	5.03
-	0	0
CE610		
+	2.50	2.50
-	0	0
CE701		
+	9.79	9.74
-	0	0
Q1(5451)		
Emitter	0.63	0.63
Collector	5	5
Base	1.33	1.33
Q2(5451)		
Emitter	0.63	0.63
Collector	5	5
Base	1.32	1.32
Q3(5451)		
Emitter	0.62	0.62
Collector	5	5
Base	1.32	1.32
Q1(5448)		
Emitter	5.59	5.58
Collector	0	0
Base	0	0
Q2(5448)		
Emitter	0	0
Collector	0	0
Base	0.70	0.70
Q201		
Emitter	0	0

MODE / PIN NO.	STOP	PLAY
Collector	0.11	0.11
Base	0.66	0.66
Q202		
Emitter	0	0
Collector	3.32	3.33
Base	0.11	0.11
Q402		
Source	5.07	5.03
Drain	5.07	5.01
Gate	0	0
Q407		
Emitter	5.07	4.966
Collector	0	0
Base	6.52	6.51
Q408		
Source	9.92	9.88
Drain	3.42	3.42
Gate	6.41	6.35
Q409		
Emitter	0	0
Collector	1.32	1.29
Base	0	0
Q410		
Emitter	9.94	9.88
Collector	5.06	5.07
Base	7.60	4.87
Q411		
Emitter	3.32	3.34
Collector	0	0.06
Base	3.32	3.33
Q414		
Emitter	3.33	3.17
Collector	0	2.16
Base	3.33	2.51
Q415		
Emitter	0	0
Collector	0	0
Base	0.7	0.7
Q416		
Emitter	0	0
Collector	5.06	0.03
Base	0	0.68
Q417		
Emitter	0	0
Collector	0	0
Base	0	3.24
Q418		
Emitter	0	0.
Collector	0	0.18
Base	5.01	0.03
Q501		
Emitter	0	0
Collector	0	0
Base	0	0

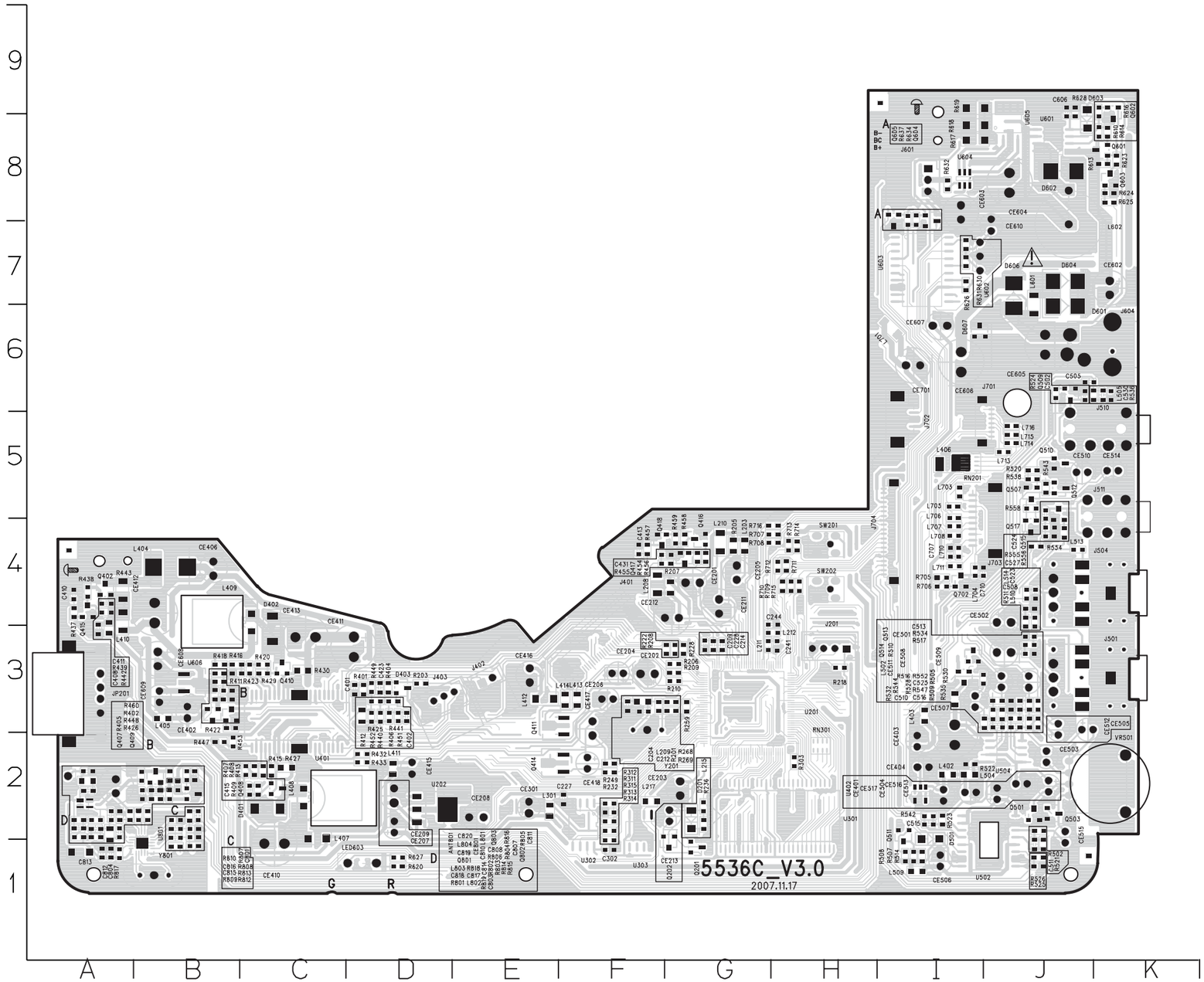
MODE / PIN NO.	STOP	PLAY
Q503		
Emitter	0	0
Collector	0	0
Base	0	0
Q507		
Emitter	0	0
Collector	1.58	1.46
Base	0	0
Q509		
Emitter	5.06	4.94
Collector	0.97	1.12
Base	0	0
Q510		
Emitter	0	0
Collector	2.3	1.58
Base	0	0
Q511		
Emitter	0	0
Collector	0	0
Base	0.61	0.61
Q513		
Emitter	0	0
Collector	0	0.03
Base	0.73	0.73
Q514		
Emitter	9.95	9.92
Collector	9.92	9.89
Base	9.2	9.17
Q515		
Emitter	5.06	4.96
Collector	0.5	0.48
Base	0	0
Q601		
Emitter	10.26	10.25
Collector	10.26	10.26
Base	10.26	10.25
Q602		
Emitter	10.26	10.25
Collector	0	0
Base	10.26	10.25
Q603		
Emitter	0	0
Collector	10.26	10.25
Base	0	0
Q702		
Emitter	0	0
Collector	0	0
Base	0	-1.92

MODE / PIN NO.	FM/ON	FM/OFF
CE801		
+	3.5	1.84
-	0	0
Q801		
Emitter	0	0
Collector	3.43	1.64
Base	0.67	0.54
Q802		
Emitter	0.06	3.33
Collector	0	0
Base	0	3.34
Q803		
Emitter	3.34	3.34
Collector	3.34	1.8
Base	0.6	3.34
U801(QN8000)		
1	0	0
2	0	0
3	0.02	0.03
4	3.34	1.68
5	3.34	1.68
6	0.86	0.40
7	0.86	0.44
8	0	0
9	0	0
10	1.56	1.1
11	0	0.1
12	0	0
13	0	0
14	0	0.1
15	0	0
16	0	0
17	0	0
18	3.34	0
19	0	0
20	0	0

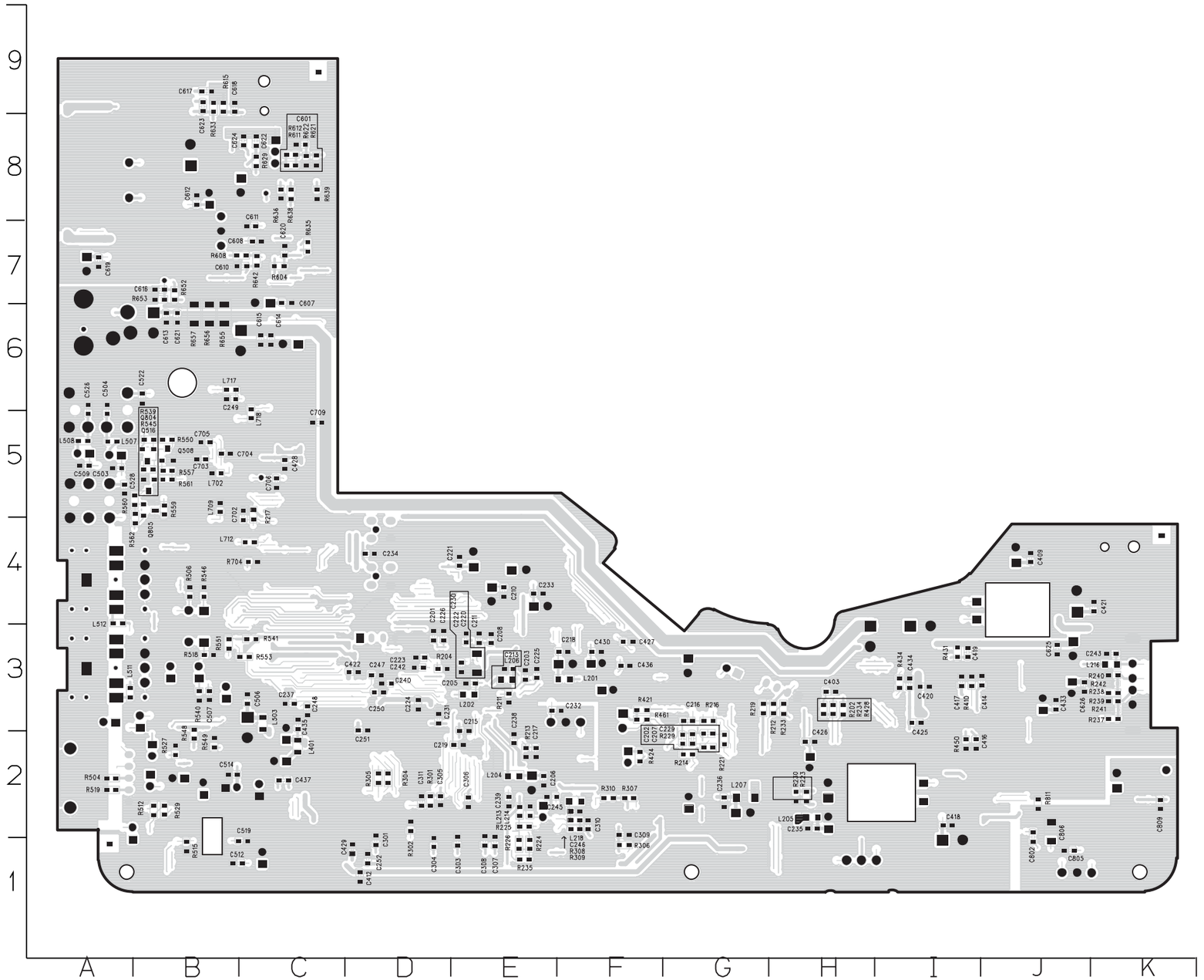
PRINTED CIRCUIT BOARD DIAGRAMS

1. MAIN P.C.BOARD

(TOP VIEW)

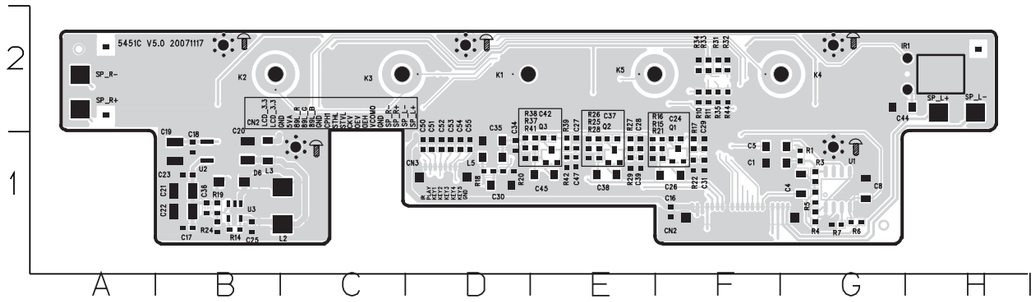


MAIN P.C.BOARD
(BOTTOM VIEW)

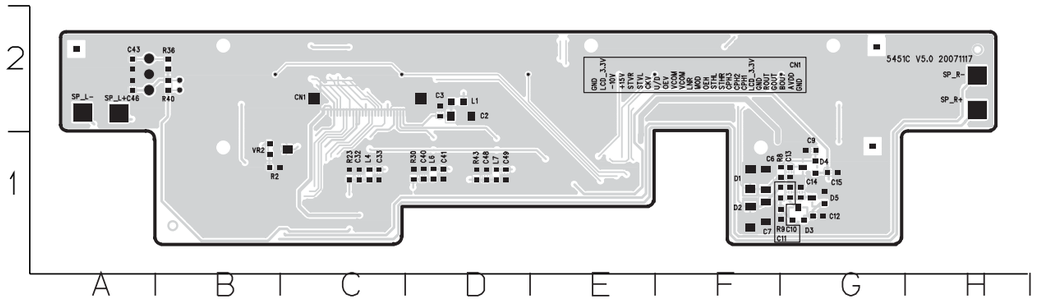


2. LCD P.C.BOARD

(TOP VIEW)

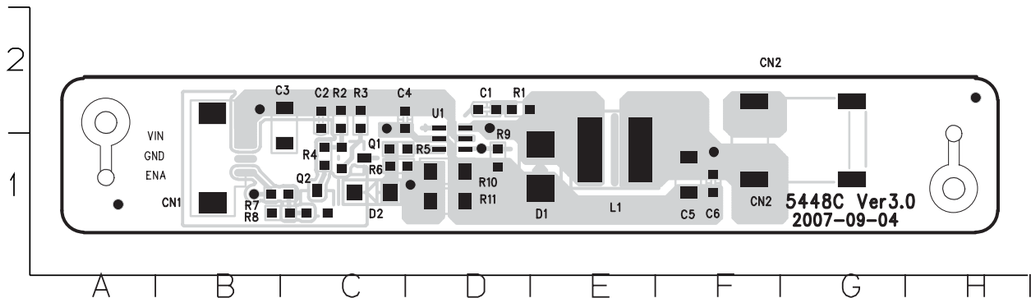


(BOTTOM VIEW)

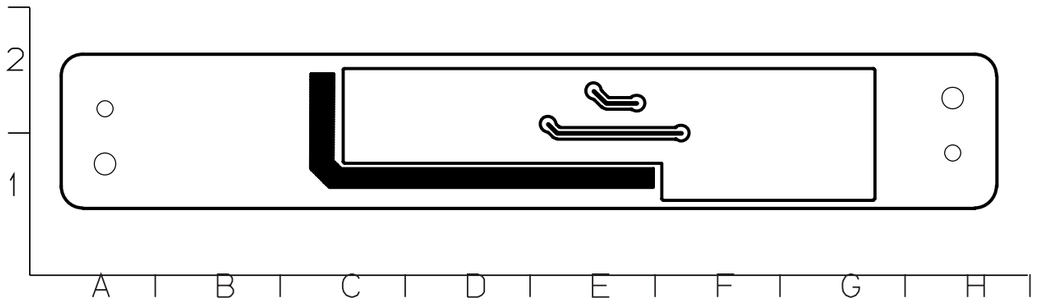


3. INVERTER P.C.BOARD

(TOP VIEW)

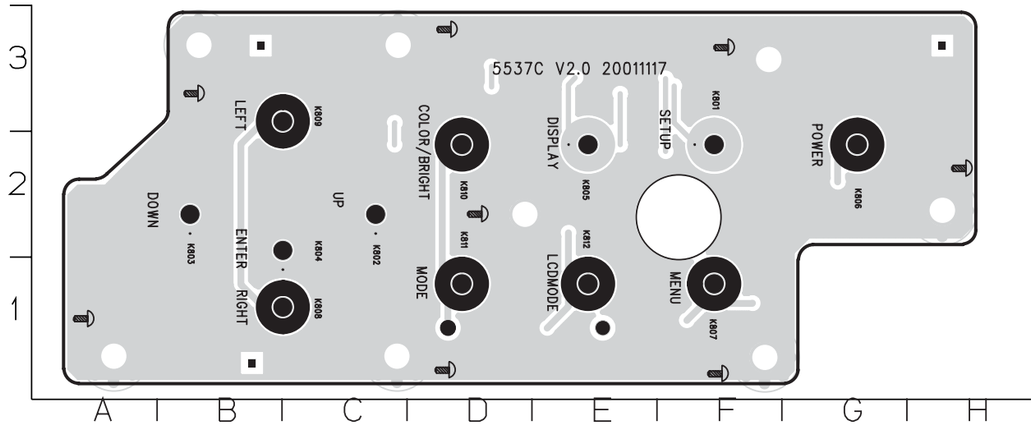


(BOTTOM VIEW)



4. KEY P.C.BOARD

(TOP VIEW)



(BOTTOM VIEW)