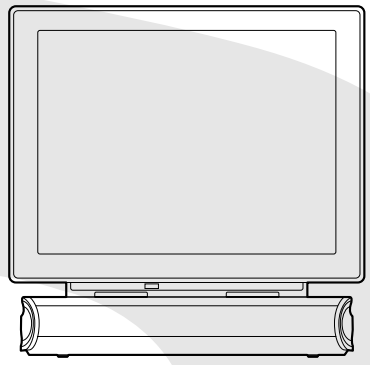
TOSHIBA

FILE NO. 050-200224

SERVICE MANUAL

LCD TV

15DL72

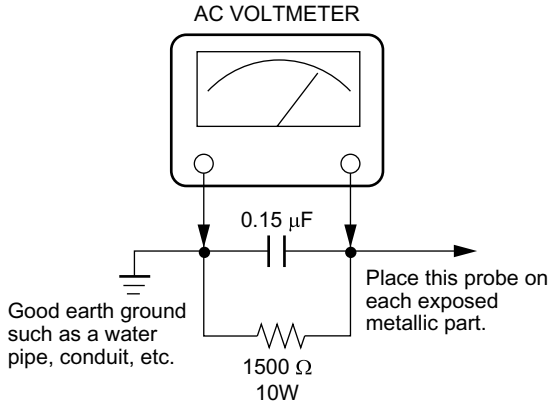


DOCUMENT CREATED IN JAPAN, Oct., 2002

SAFETY PRECAUTION

WARNING: Service should not be attempted by anyone unfamiliar with the necessary precautions on this TV. The following are the necessary precautions to be observed before servicing this chassis.

1. An isolation Transformer should be connected in the power line between the TV and the AC line before any service is performed on the TV.
2. When replacing a chassis in the cabinet, always be certain that all the protective devices are put back in place, such as; non-metallic control knobs, insulating covers, shields, isolation resistor-capacitor network etc.
3. Before returning the set to the customer, always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as terminals, screwheads, metal overlays, control shafts etc. to be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000Ω per volt or more sensitivity in the following manner: Connect a 1500Ω 10W resistor, paralleled by a 0.15 μF, 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 1500Ω resistor and 0.15 μF capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 5.25V(rms). This corresponds to 3.5 mA(AC). Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the international hazard symbols on the schematic diagram and the parts list.

Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

⚠ DANGER

The components such as the power supply and FL inverter carry high voltages. When you partially disassemble the computer and turn on the components, use extreme care not to touch the connectors and components to avoid the risk of electrical shock. Do not disassemble individual components during first-level maintenance.

SAFETY NOTICE

Handling the LCD Module

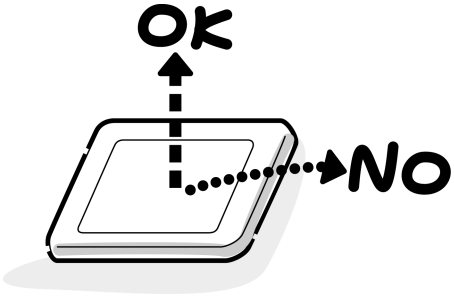
Safety Precaution

In case the screen is damaged and the internal liquid leaks, do not suck or drink the internal fluid. Nor do you touch it either, otherwise you might be poisoned or get a rash with your skin. If the internal fluid enters your mouth, rinse with water. If it adheres to your skin or clothes, wipe it away with alcohol and then wash with water. If it enters your eyes, wash with running water immediately.

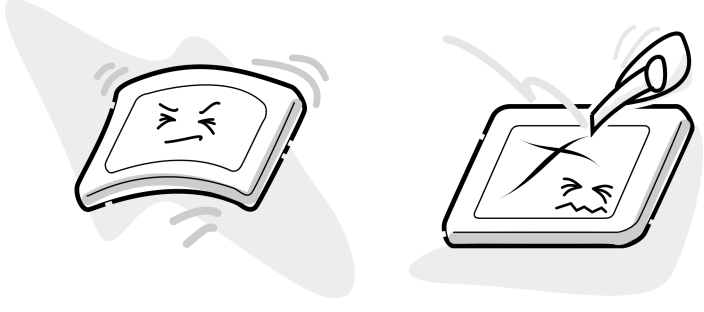
Precautions for handling the LCD module

The LCD module can be easily damaged during assembly or disassembly. Observe the following precautions when handling the LCD module:

1. When installing the LCD module in the LCD cover, be sure to seat it so that it is properly aligned and maximum visibility of the display is maintained.



2. Be careful to align the four holes at the right side and left side of the LCD module with the corresponding holes in the LCD cover before securing the module with four screws. Do not force the module into place, because stress can affect its performance. Also, the panel's polarized surface is easily scarred, so be careful when handling it.

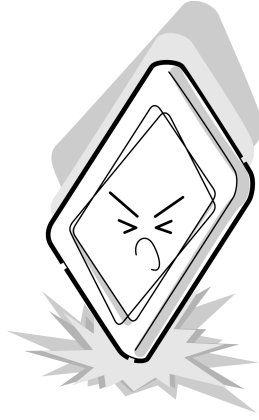


3. If the panel's surface gets dirty, wipe it with cotton or a soft cloth. If it is still dirty, try breathing on the surface to create a light condensate and wipe it again.

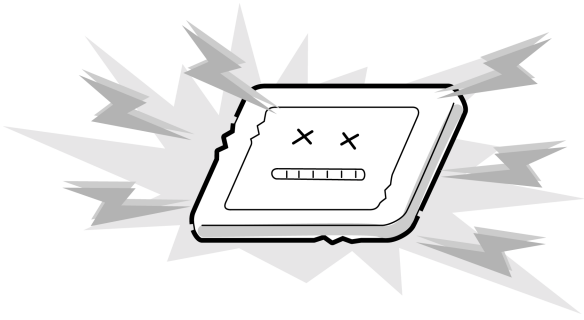
   If the surface is very dirty, we recommend a CRT cleaning agent. Apply the agent to a cloth and then wipe the panel's surface. Do not apply cleanser directly to the panel. Also, never scratch the surface.

4. If water or other liquid is left on the panel's surface for a long period, it can change the screen's tint or stain it. Be sure to quickly wipe off any liquid.

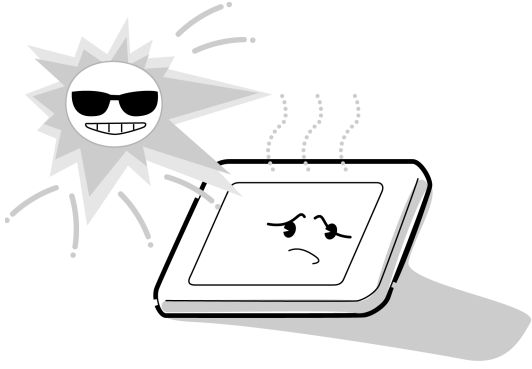
5. Glass is used in the panel, so be careful not to drop it or let it strike a hard object, which could cause breakage or cracks.



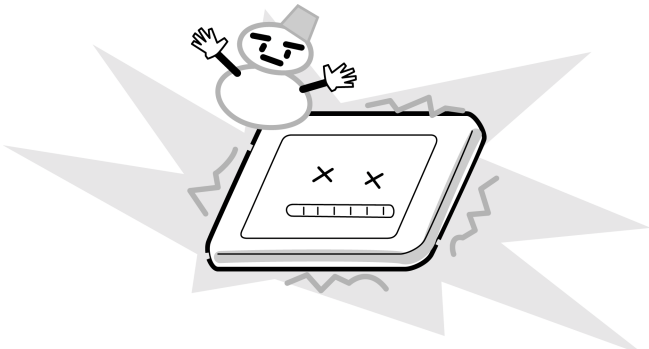
6. CMOS-LSI circuits are used in the module, so guard against damage from electrostatic discharge. Be sure to wear a wrist or ankle ground when handling the module.

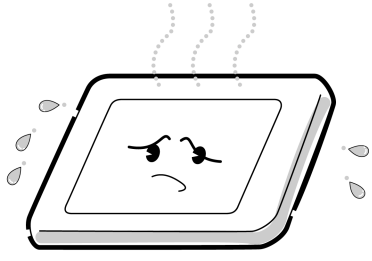


7. Do not expose the module to direct sunlight or strong ultraviolet rays for long periods.

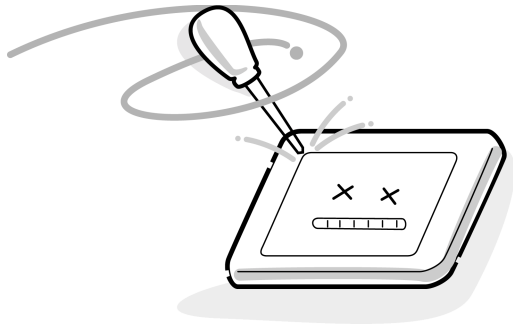


8. Do not store the module at temperatures below specifications. Cold can cause the liquid crystals to freeze, lose their elasticity or otherwise suffer damage.

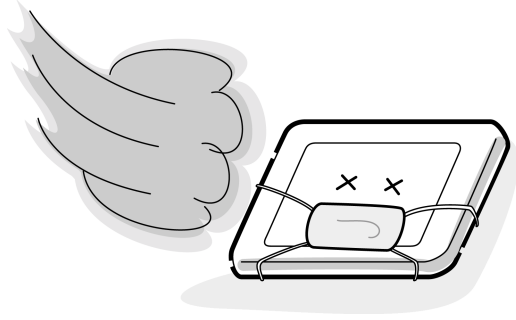




9. Do not disassemble the LCD module. Disassembly can cause malfunctions.



10. If you transport the module, do not use packing material that contains epoxy resin (amine) or silicon glue (alcohol or oxime). These materials can release gas that can damage the panel's polarization.



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SECTION 1
ADJUSTMENT PROCEDURES AND PART REPLACEMENT

1. REMOVAL

1-1. Front Panel

1. Remove five screws (1).

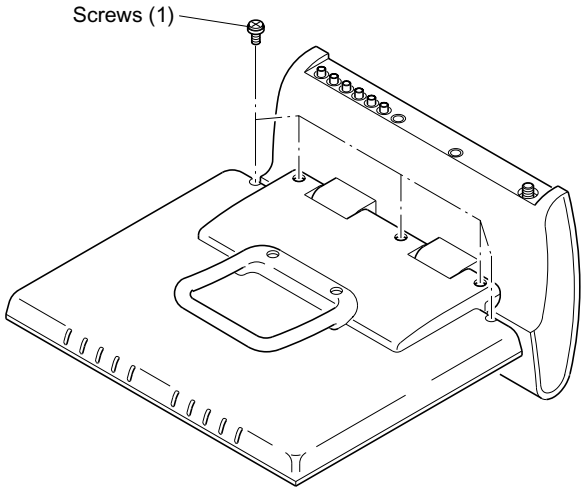


Fig. 1-1-1

2. Place the main unit horizontally (similar to use when hanging on wall), insert finger from the inner side (2) and release the front panel (2) claws in order from the bottom (arrow A) (there are eleven peripheral claws).

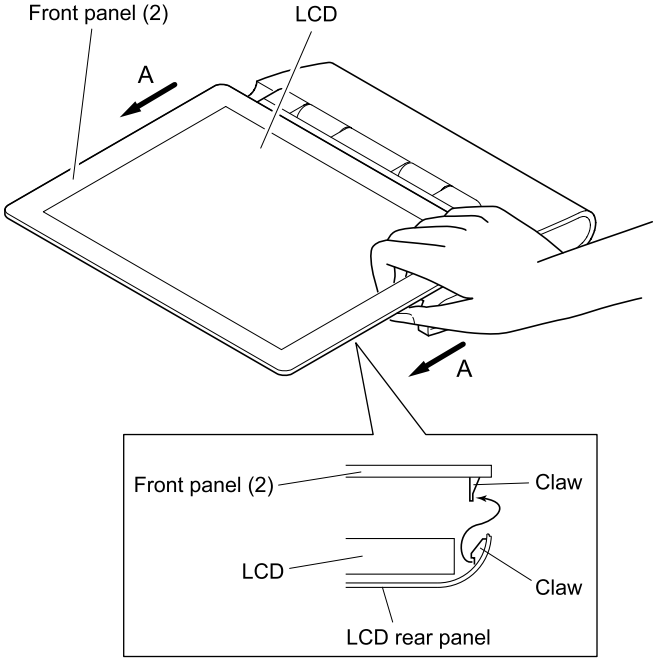


Fig. 1-1-2

Note:

- A "snapping" sound will be heard when the claw is released.
- Take care not to scratch the LCD.
- Caution should be taken to avoid injury from edges on metal areas when removing the LCD panel.
- Return the wiring to their original positions during assembly and take care not to get wires caught in the front panel.

1-2. LCD Panel

1. Remove four screws (1).

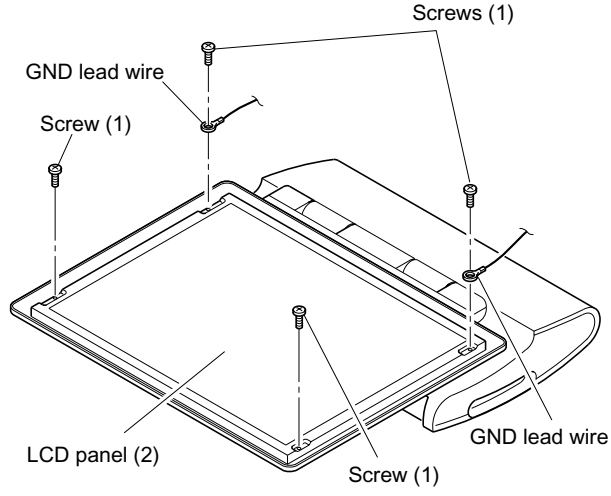


Fig. 1-1-3

2. Lift the LCD panel (2) up and remove the connector (3) from back.

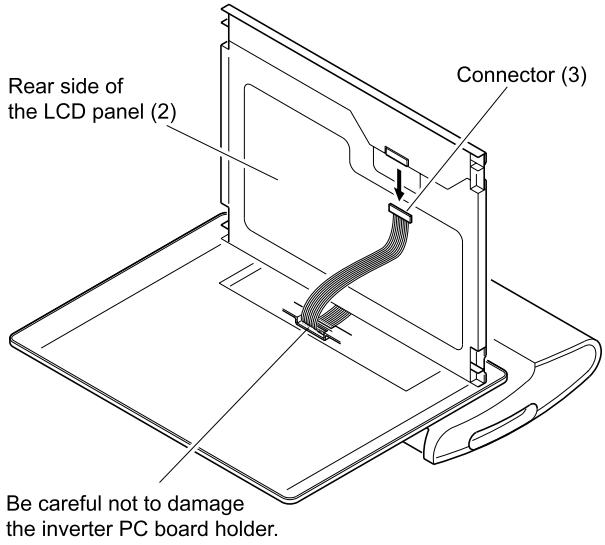


Fig. 1-1-4

3. Turn the LCD (2) on its back and remove two screws (4).
4. Slide the back lights (5) on the top and bottom out to the left side and remove the LCD (2).

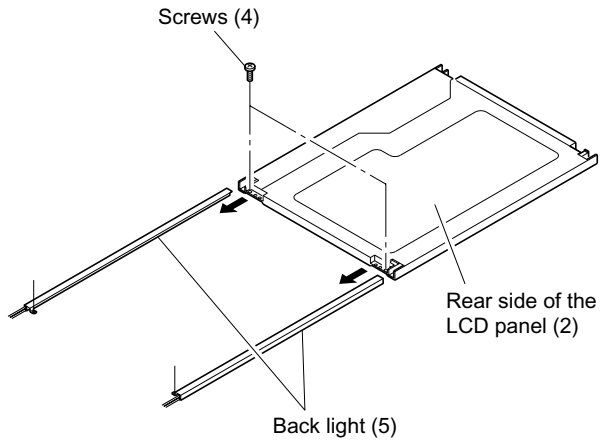


Fig. 1-1-5

Note:

- Return the wiring to their original position when assembling.

1-3. Inverter PC Board

1. Remove the wire of connector (1) from the inverter PC board holder (2) claw A.
2. Remove two screws (3).

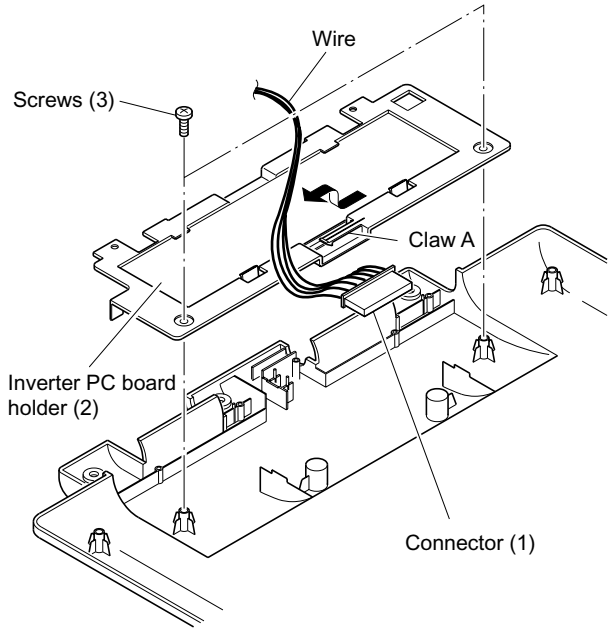


Fig. 1-1-6

3. Remove the connectors (4) from the four locations and remove the wire from the three locations of claw B.

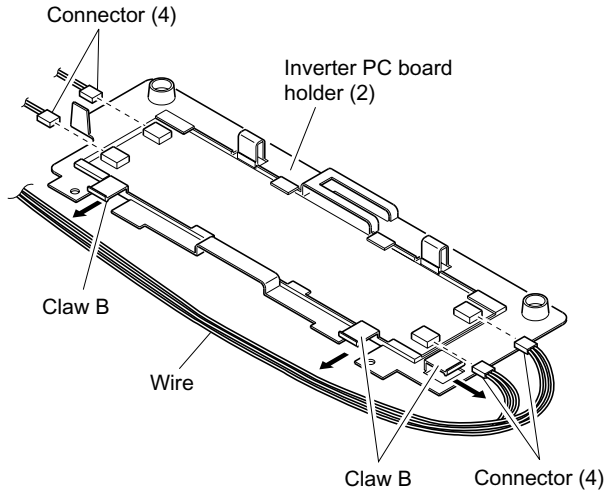


Fig. 1-1-7

4. Release four claws C, then remove the inverter PC board holder (2) from the inverter PC board (5).
5. Remove the connector (6) from the one location, then remove the inverter PC board (5).

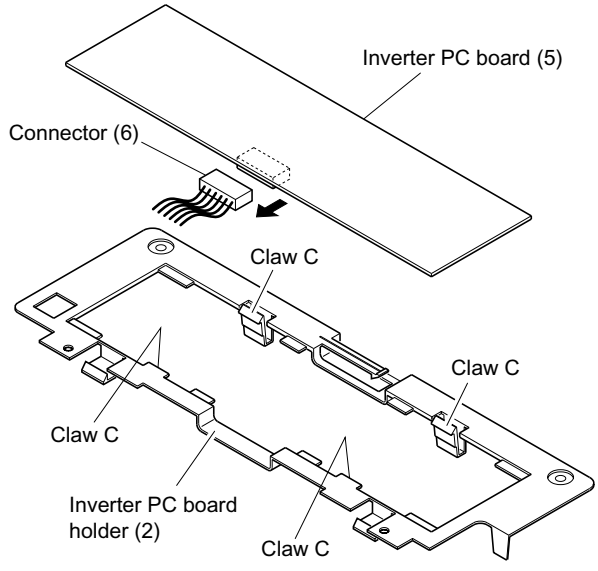


Fig. 1-1-8

Note:

- Return the wiring to their original position when assembling.
- The inverter PC board contains high voltage circuitry and therefore the power supply plug should always be unplugged during disassembly and assembly.

  Additionally, care should be taken when servicing while the power is on.

1-4. Sensor PC Board

1. Remove one screw (1) and remove the connector (2) from the one location, then remove the sensor PC board (3).

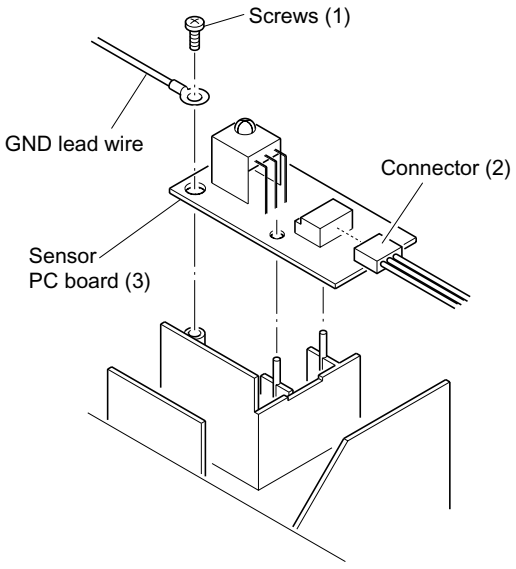


Fig. 1-1-9

Note:

- When attaching the sensor PC board (3), bundle the wires with the band (4) and insert into groove then attach the sensor PC board (3) from the top.

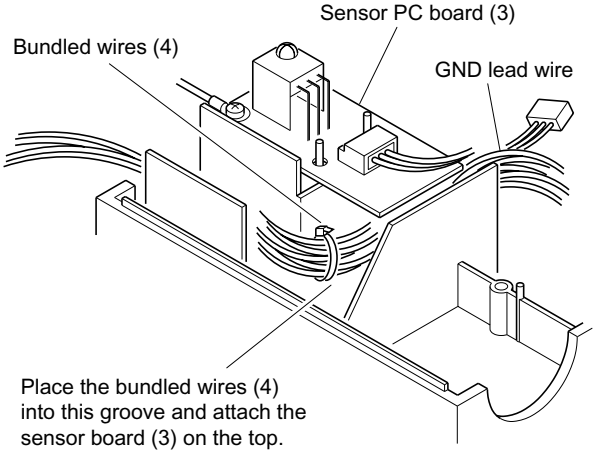


Fig. 1-1-10

1-5. Handle

1. Remove two screws (1), then remove the handle (2).

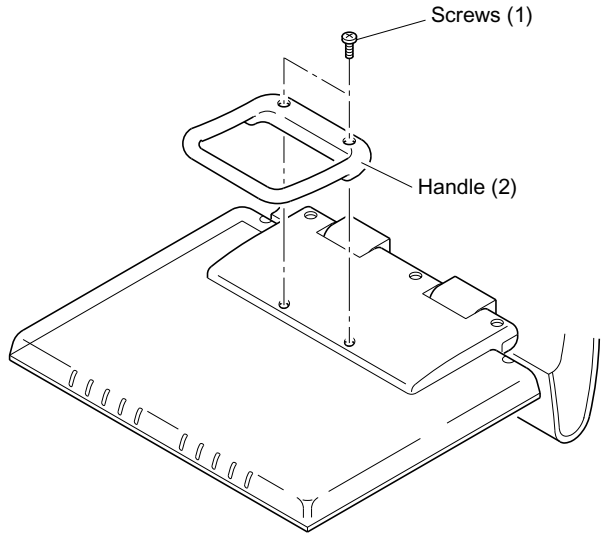


Fig. 1-1-11

1-6. LCD Rear Cover

1. Remove the front panel, the LCD panel and the inverter PC board. (Refer to item 1-1, 1-2 and 1-3.)
2. Remove two screws (1), then remove the support (2).
3. Remove two screws (3) and remove the LCD rear cover (4) in a vertical position.

Note:

- If not removed when in a vertical position, the hinges may become deformed.

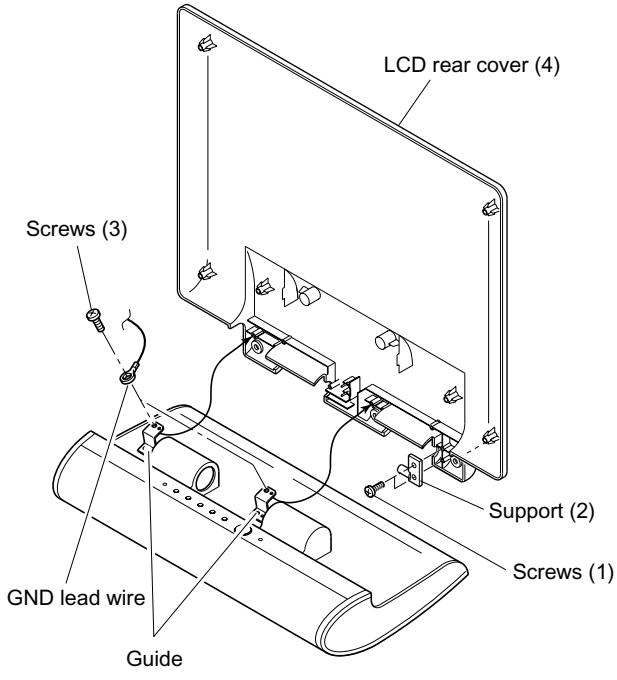


Fig. 1-1-12

1-7. Wall Hanging Plate

1. Remove three screws (1), then remove the wall hanging plate (2).

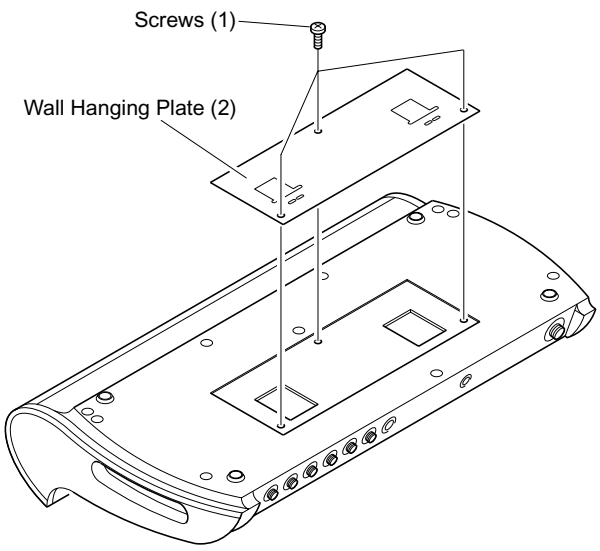


Fig. 1-1-13

1-8. Bottom Cover

1. Remove seven screws (1) and three screws (2), then remove the bottom cover (3).

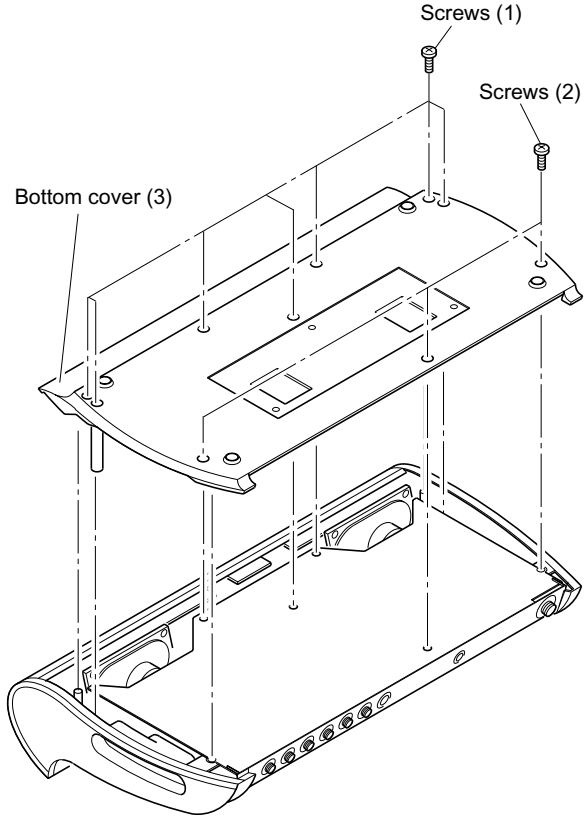


Fig. 1-1-14

1-9. Side Cover

1. Remove the left and right side covers.

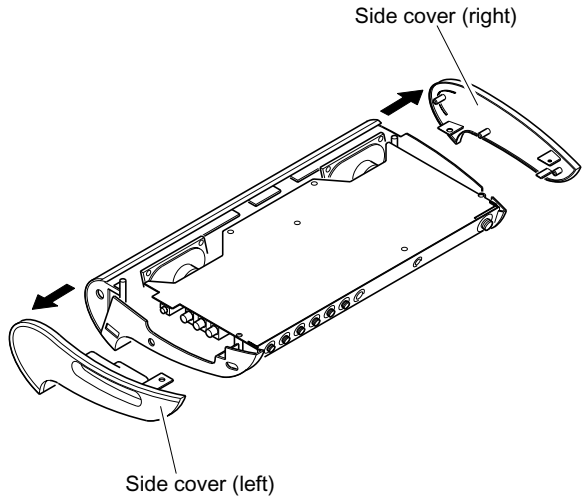


Fig. 1-1-15

1-10. Rear Terminal Panel, Main PC Board

1. Remove two screws (1).
2. Remove two claws A, then remove the rear terminal panel (2).

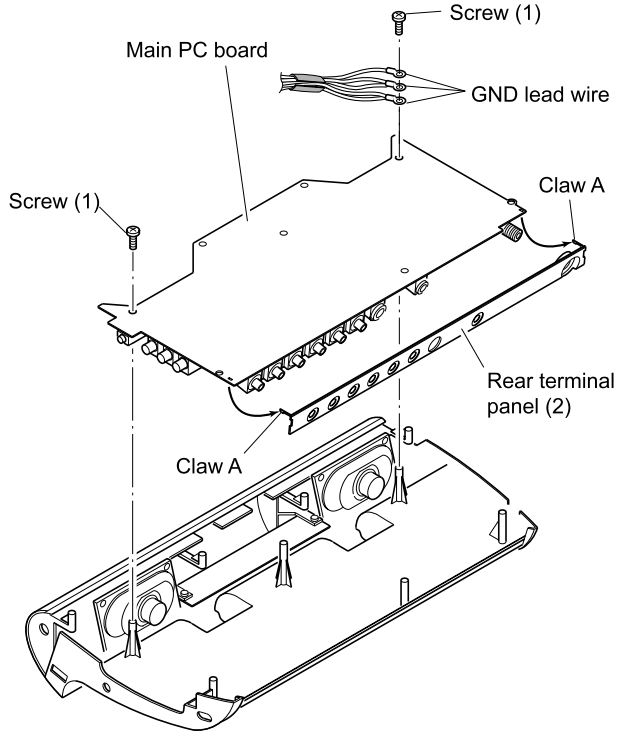


Fig. 1-1-16

3. Remove the connectors (4) from the five locations, then remove the main PC board (5).

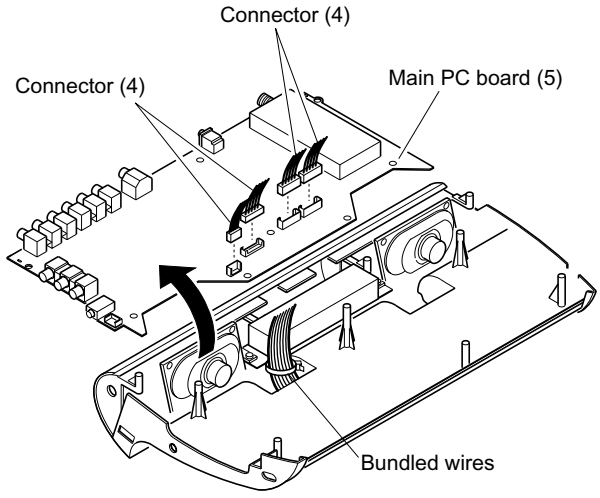


Fig. 1-1-17

Note:

- Return the wiring to their original positions during assembly.

1-11. Front Net, Speaker

1. Remove four screws (1).
2. Remove the GND lead wire (2), then remove the front net assembly (3).
3. Remove four screws (4), then remove the right speaker (5), four screws (6) and the left speaker (7).
4. The front net assembly (3) will come apart to the front net (8) and the chassis (9) when claws A are released.

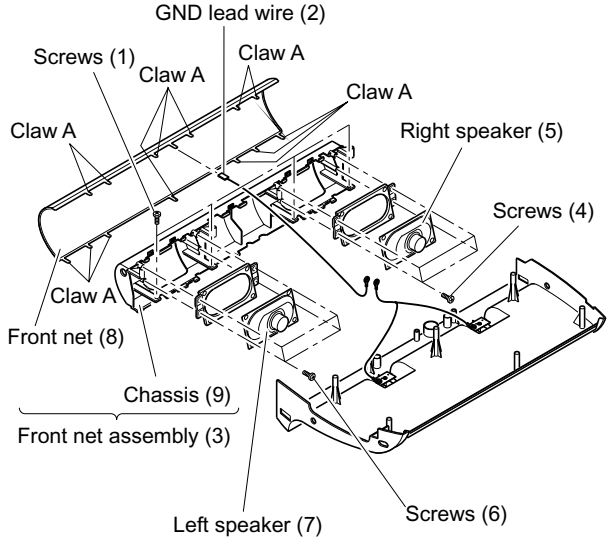


Fig. 1-1-18

1-12. Switch PC Board

1. Remove the cushion (1).
2. Remove the connector (2).
3. Remove one screw (3), then remove the switch PC board (4).
4. Remove the power button (5), the power button cover (6) and the 5-knob switch button (7).

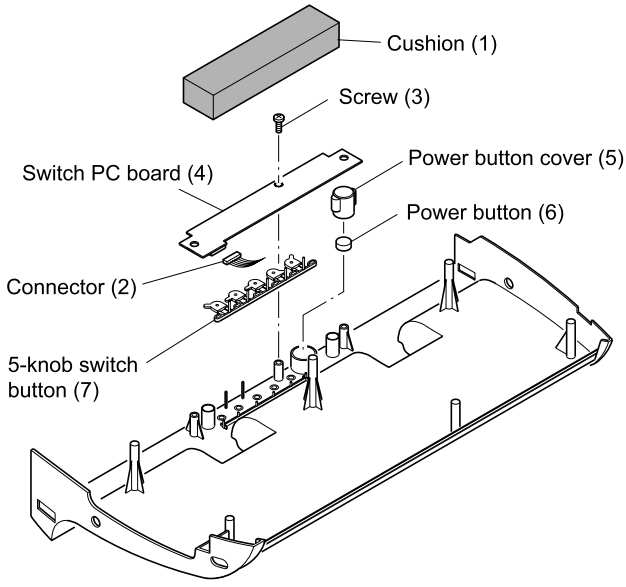


Fig. 1-1-19

1-13. Hinge, Top Cover

1. Remove two screws (1), remove the left support (2) and the left hinge (3).
2. Remove two screws (4), the right support (5) and the right hinge (6), then remove the top cover (7).

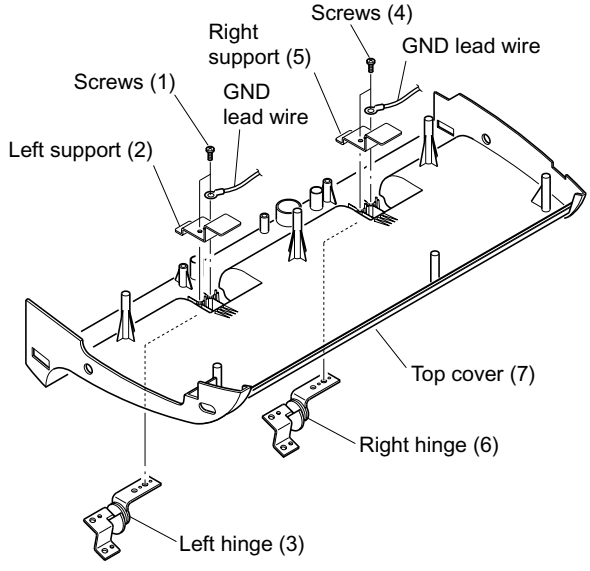


Fig. 1-1-20

2. GND LEAD WIRE CONNECTION DIAGRAM

When assembling, refer to the diagram below for the GND lead wire connection.

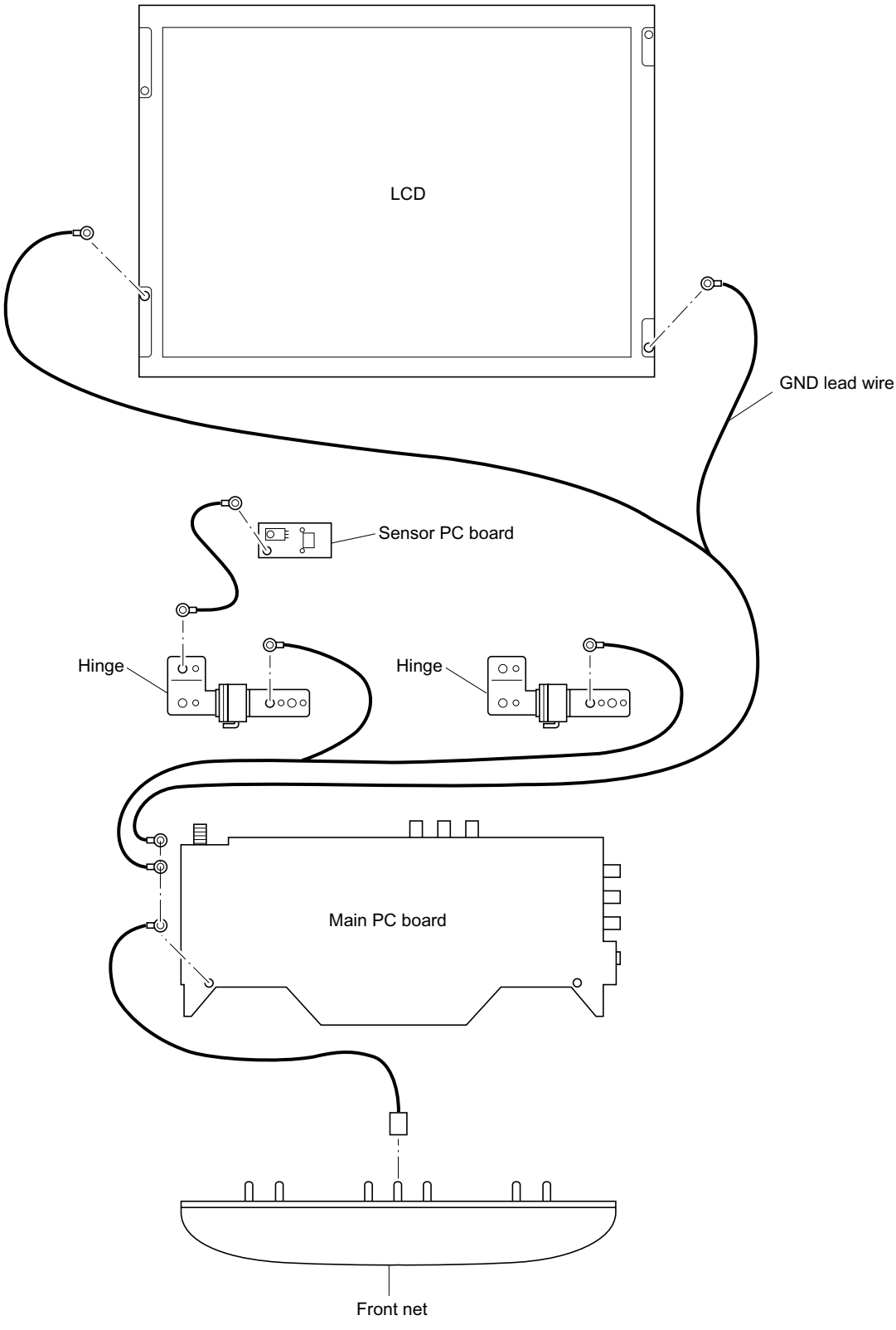


Fig. 1-2-1

3. LOCATION OF MAIN PARTS

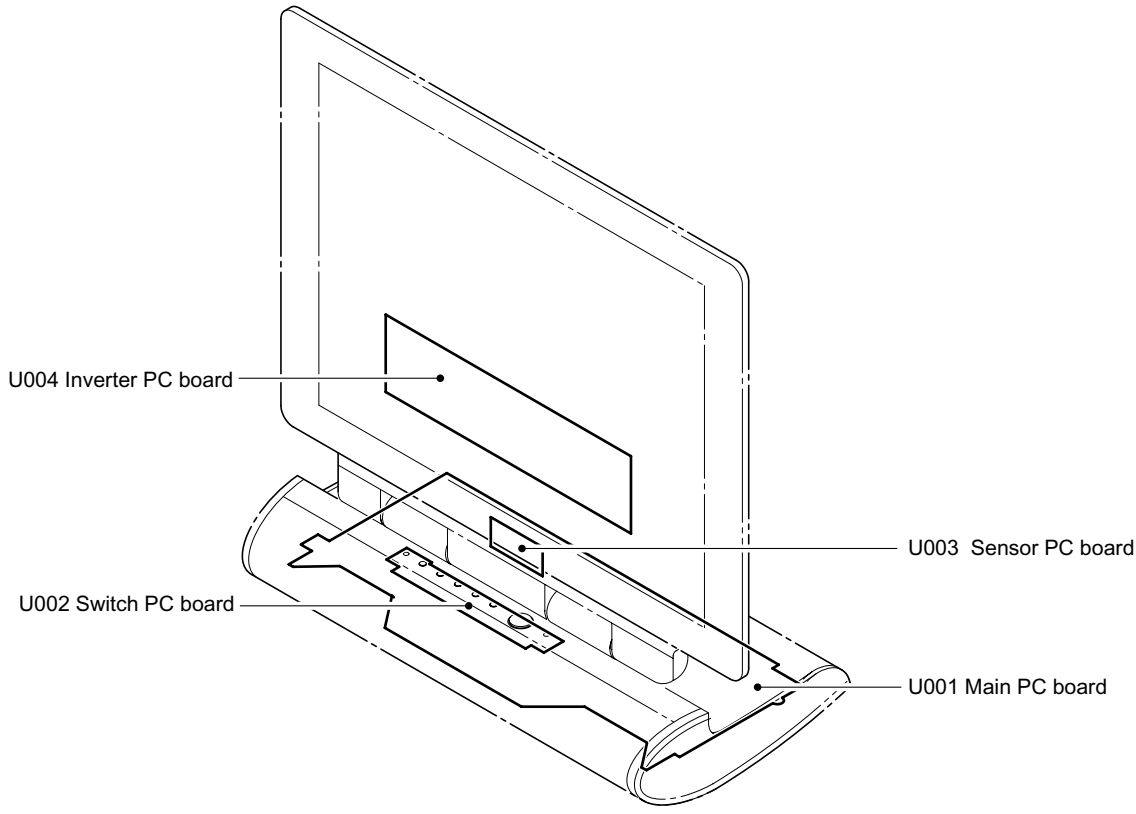


Fig. 1-3-1

4. TROUBLESHOOTING

4-1. No Power (No Video & No Sound)

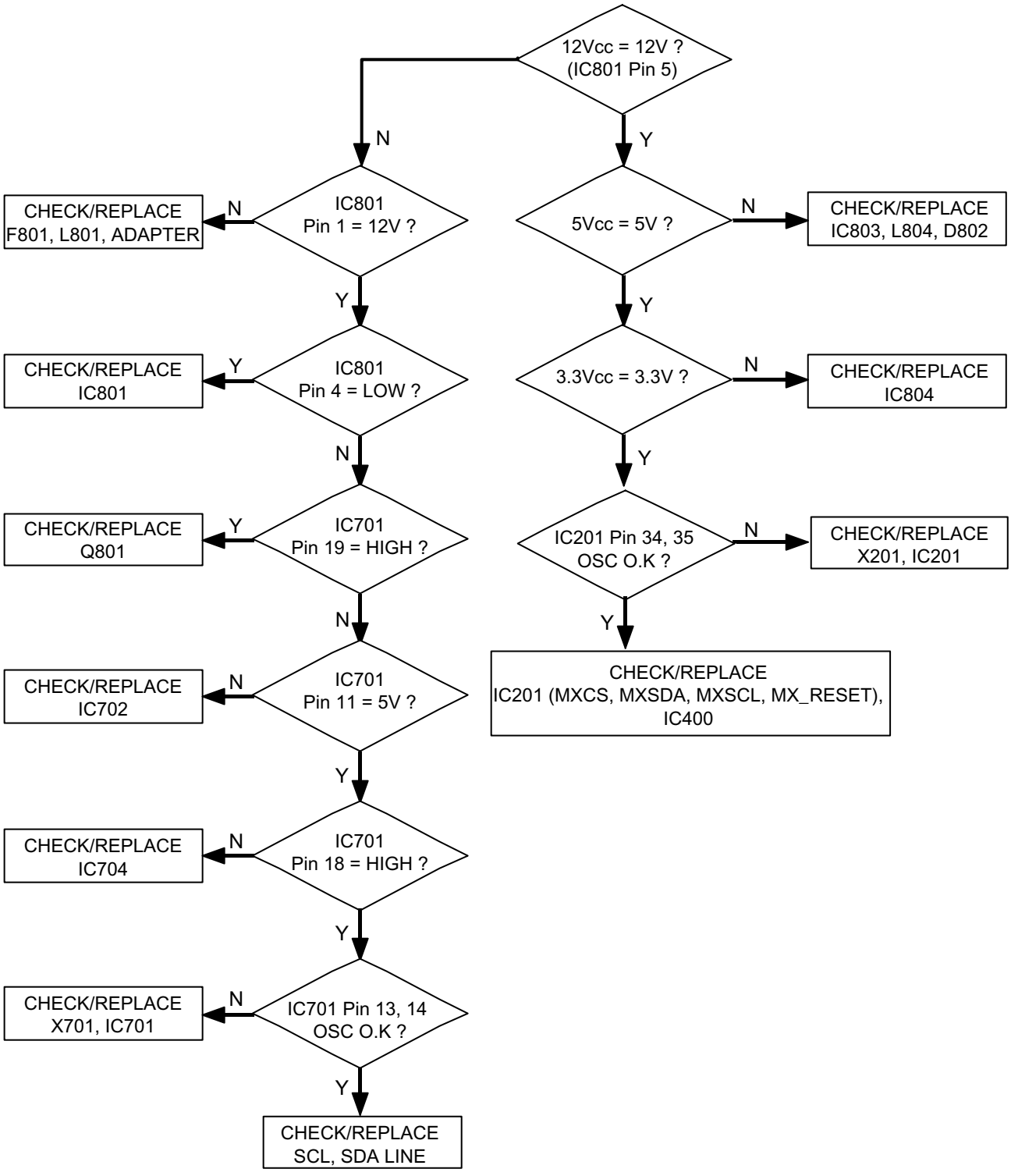


Fig. 1-4-1

4-2. No Video

4-2-1. No Video (Sound O.K)

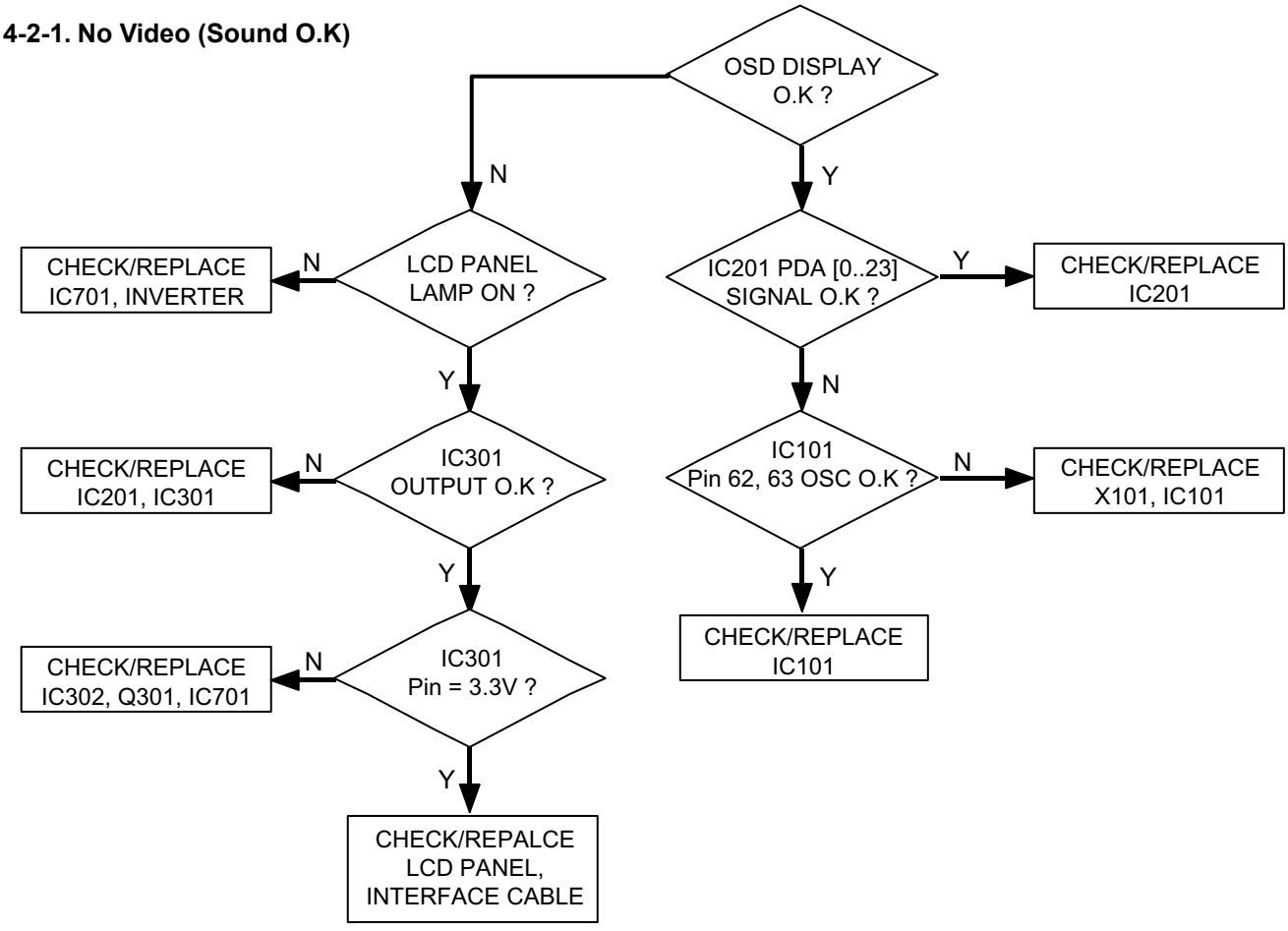


Fig. 1-4-2

4-2-2. No Video (Sound O.K)

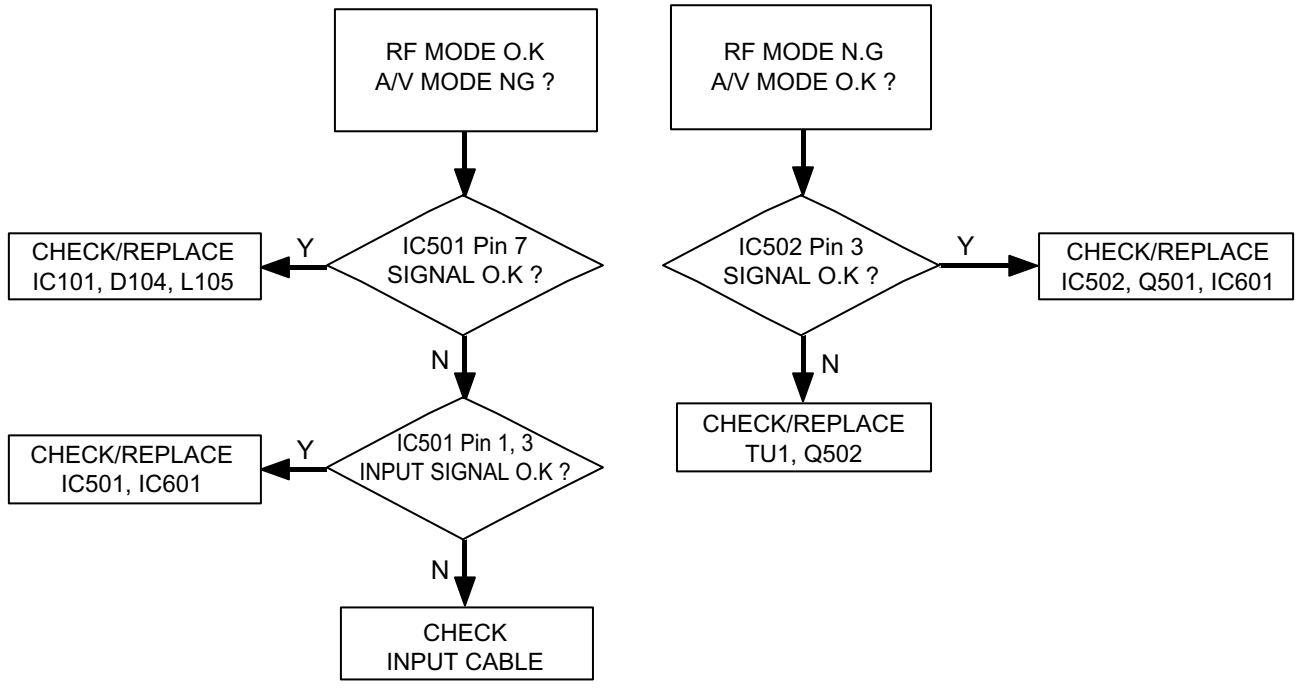


Fig. 1-4-3

4-3. No Sound (Video O.K)

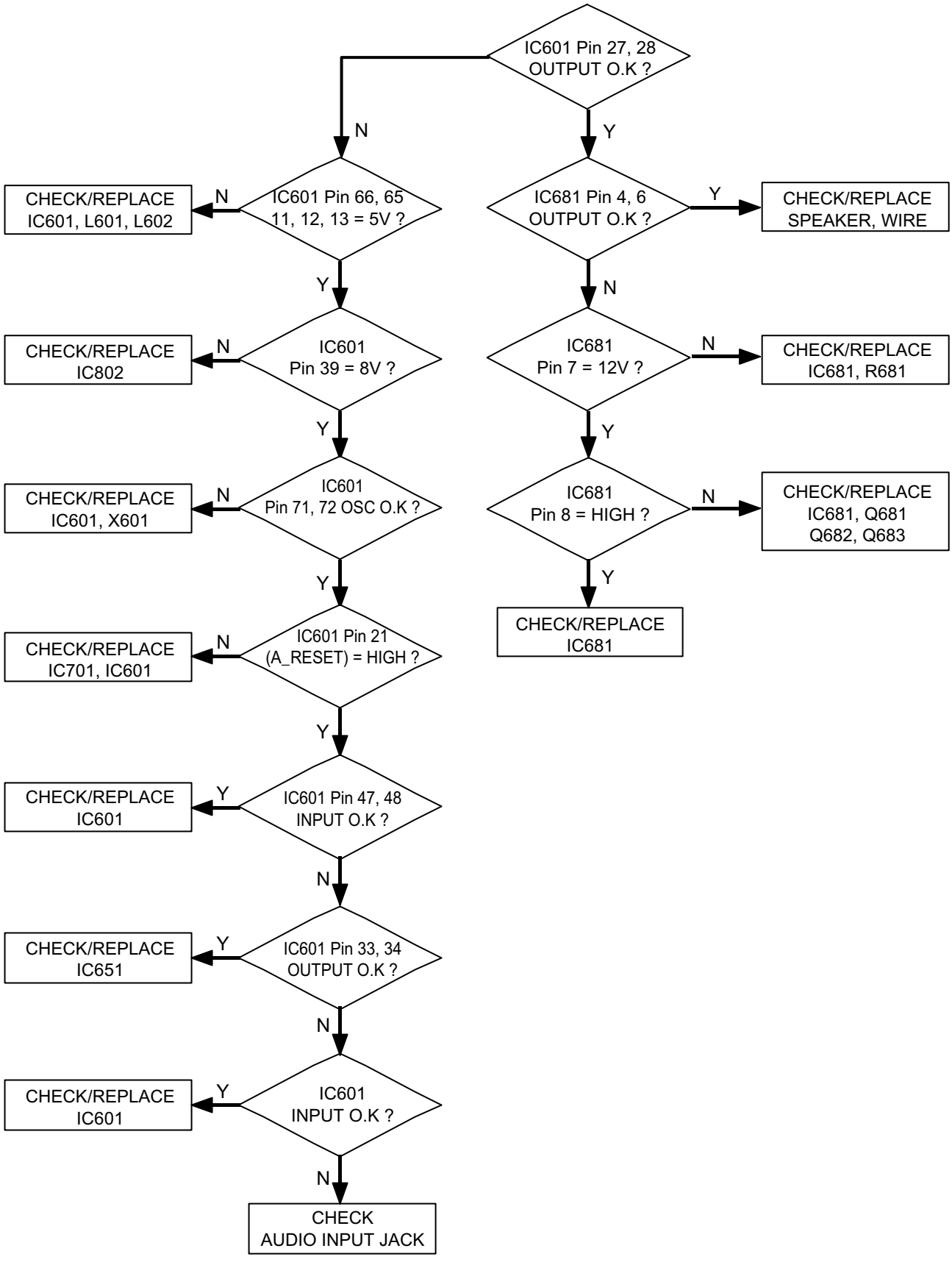


Fig. 1-4-4

SECTION 2
SERVICING DIAGRAMS

1. CIRCUIT SYMBOLS AND SUPPLEMENTARY EXPLANATION

1-1. Solid Resistor Indication

Table 2-1-1

Symbol	..... Carbon film ..... Oxide metal film
Unit	None ..... Ω k ..... kΩ M ..... MΩ
Tolerance	None ..... ±5% F ..... ±1% K ..... ±10%
Rated Wattage	(1) Chip Parts None .. 1/16W (2) Other Parts None .. 1/6W Other than above, described in the Circuit Diagram.

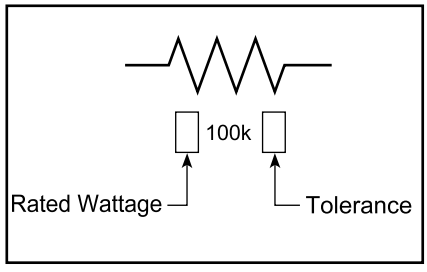


Fig. 2-1-1

1-2. Inductor Indication

Table 2-1-2

Unit	None ..... H μ ..... μH m ..... mH
Tolerance	None ..... ±5% K ..... ±10% M ..... ±20%
Type	PL ..... Peaking Others display model

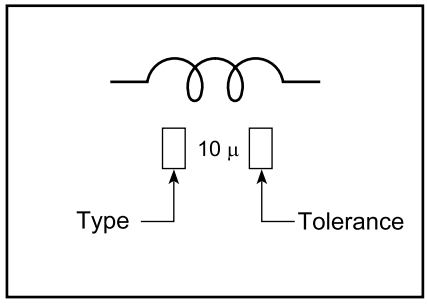


Fig. 2-1-2

1-3. Capacitance Indication

Table 2-1-3

Symbol	..... Electrolytic, Special electrolytic ..... Ceramic, Film
Unit	None ..... F μ ..... μF n ..... nF p ..... pF
Rated voltage	None ..... 50V For other than 50V and electrolytic capacitors, described in the Circuit Diagram.
Tolerance	(1) Ceramic, plastic, and film capacitors None .. ±5% or more (2) Electrolytic, Trimmer Tolerance is not described.
Temperature characteristic (Ceramic capacitor)	None ..... SL For others, temperature characteristics are described.

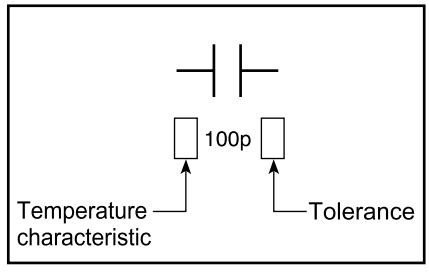


Fig. 2-1-3

1-4. Waveform and Voltage Measurement

- The various wave forms of the color circuit and voltage measurement values are for when the service color bar signal is received with ample reception and a proper image is received.
- Other various wave forms of circuits and voltage measurement values are for when general broadcasts are normally received and will differ slightly depending on the broadcast contents. Use it as a standard during servicing.
- All voltage values except the waveforms are expressed in DC and measured by a digital voltmeter.

1-5. Precautions for Part Replacement

- In the schematic diagram, parts marked ⚠ (ex. ⚠ F800) are critical part to meet the safety regulations, so always use the parts bearing specified part codes (SN) when replacing them.
- Using the parts other than those specified shall violate the regulations, and may cause troubles such as operation failures, fire etc.

2. BLOCK DIAGRAMS

2-1. Power Block Diagram

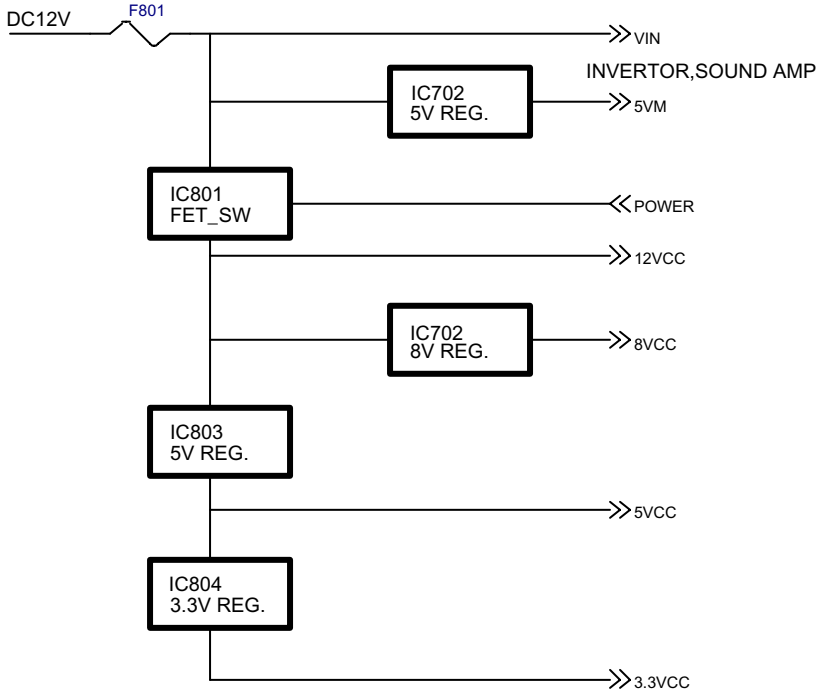


Fig. 2-2-1

2-2. Inverter Block Diagram

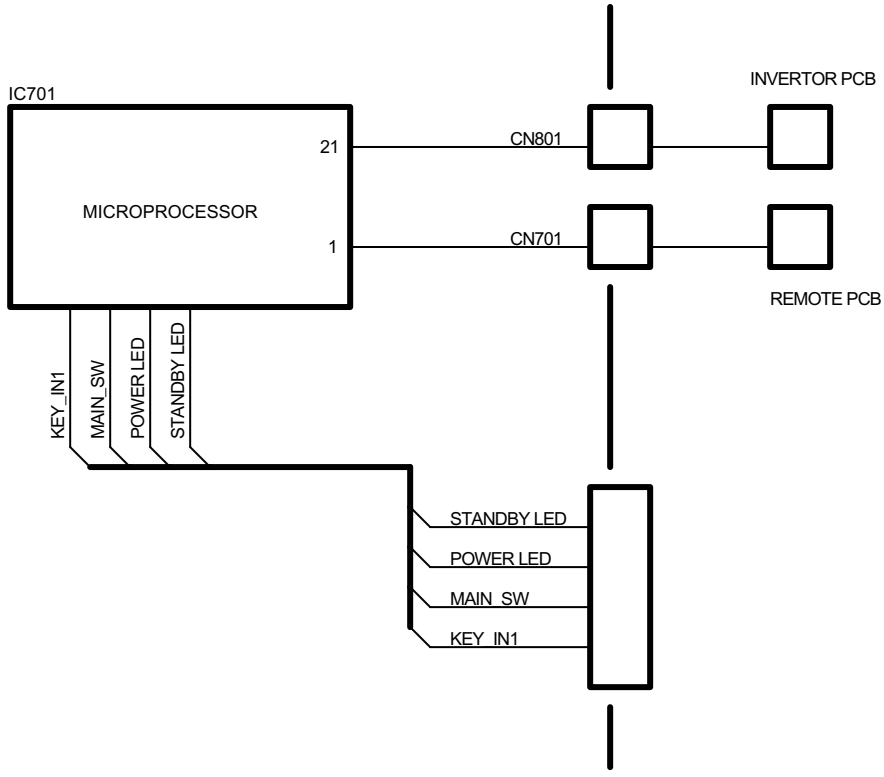


Fig. 2-2-2

2-2-1. Pin Assignments (microprocessor) IC701: KS88C6348

No	Name	Signal	In/Out	Logic	Remark
1	IR-IN	IR-Input	Input	Active Low	Remote Control Signal Input
2	MAIN_SW	MAIN-SWITCH INPUT	Input	Active High	MASTER SW ON/OFF INPUT
3	DVD_ID	DVD IDENT	Input	Active Low	DVD JACK IDENT
4	SCART_ID	Scart Ident	Input	Active High	Scart Jack Ident
5	SVHS_ID	SVHS Ident	Input	Active Low	SVHS Jack Ident
6	BUS STOP	BUS STOP	-	Active Low	SCL, SDA BUS STOP
7	PWR_LED	POWER LED	Output	Active High	POWER LED OUTPUT
8	STB_LED	STANDBY LED	Output	Active High	STANDBY LED OUTPUT
9	N.C	N.C	-	-	
10	N.C	N.C	-	-	
11	VCC	5V	-	-	5V
12	GND	GND	-	-	GND
13	XTAL	Xtal Output	Output	-	
14	XTAL	Xtal Input	Input	-	
15	TEST	GND	-	-	
16	N.C	N.C	-	-	
17	N.C	N.C	-	-	
18	RESET	RESET	Input	Active Low	Microprocessor RESET
19	POWER	POWER PORT	Output	Active Low	Power on : Low, Stand-by : High
20	EXT_MUTE	External Mute	Output	Active High	Mute On : High, Mute off : Low
21	INV_ON	INVERTOR CONTROL	Output	PWM	INVERTOR ON : HIGH, OFF : LOW
22	MX SCL	MX SCL	Output	Active Low	MX88L281 Serial Clock
23	MX SDA	MX SDA	Output	Active Low	MX88L281 Serial Data
24	MX ENA	MX ENABLE	Output	Active Low	MX88L281 Data Enable
25	MX RST	MX RESET	Output	Active Low	MX88L281 Reset
26	BUF ENA	Buffer Enable	Output	Active High	Buffer Enable
27	N.C	N.C	-	-	
28	N.C	N.C	-	-	
29	N.C	N.C	-	-	
30	N.C	N.C	-	-	
31	N.C	N.C	-	-	
32	N.C	N.C	-	-	
33	GND	GND	-	-	GND
34	VCC	5V	-	-	5V
35	KEY-IN	Key Input	Input	ADC	PANEL SWITCH CONTROL
36	N.C	N.C	-	-	
37	PANEL_PWR	PANEL POWER CONTROL	Output	ACTIVE HIGH	PANEL VCC CONTROL PORT
38	WOW_SEL	WOW SELECT	Output	ACTIVE HIGH	WOW ON : HIGH, OFF : LOW
39	AV_RESET	AUDIO/VIDEO Reset	Output	Active Low	MSP34* OG/VPC3230 RESET
40	SCL	SCL	-	-	Serial Bus Clock
41	SDA	SDA	-	-	Serial Bus Data
42	VID_SEL	VIDEO SELECT	Output	Active High	AV1/AV2 SELECT PORT

2-3. Main Block Diagram

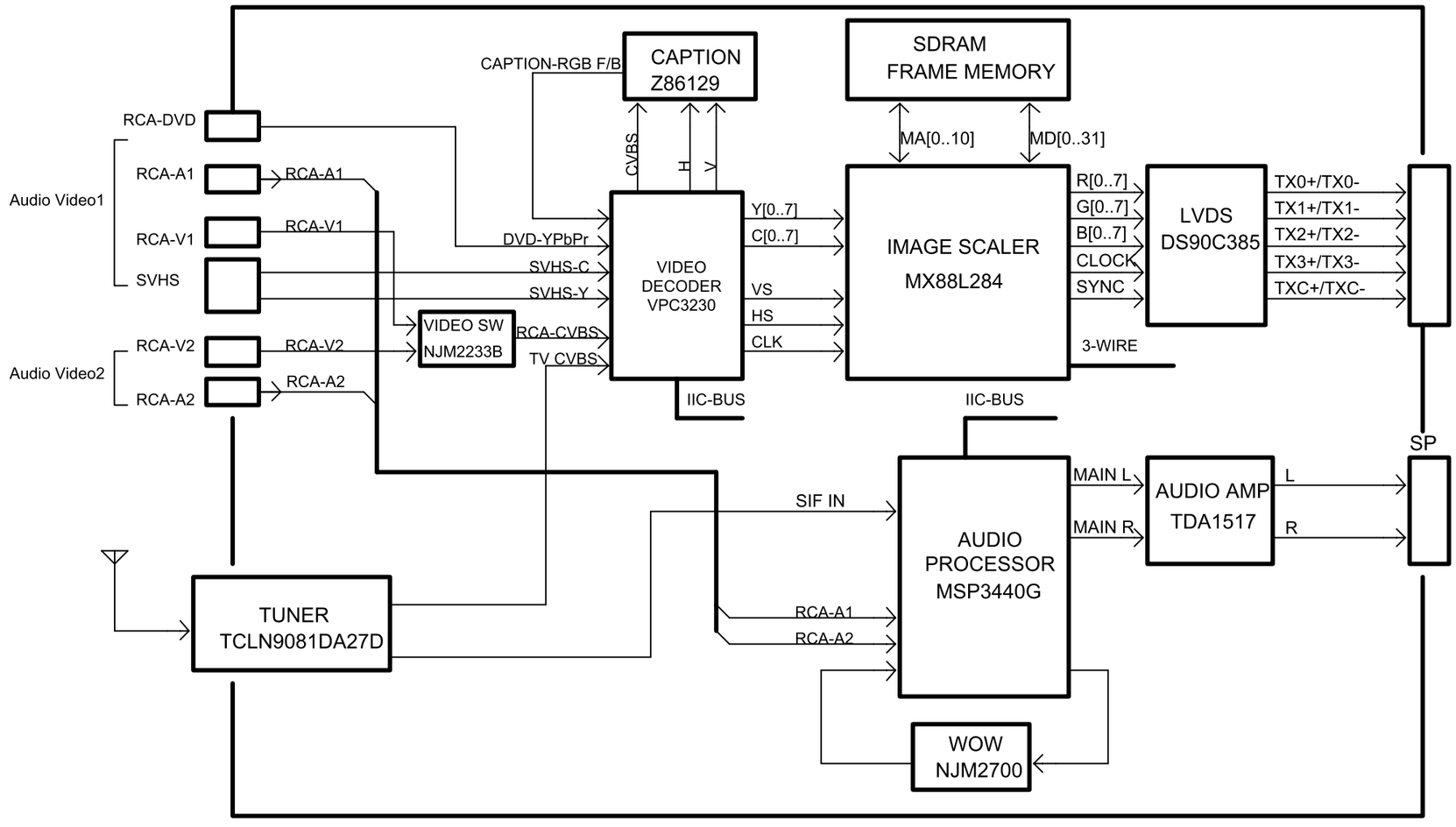
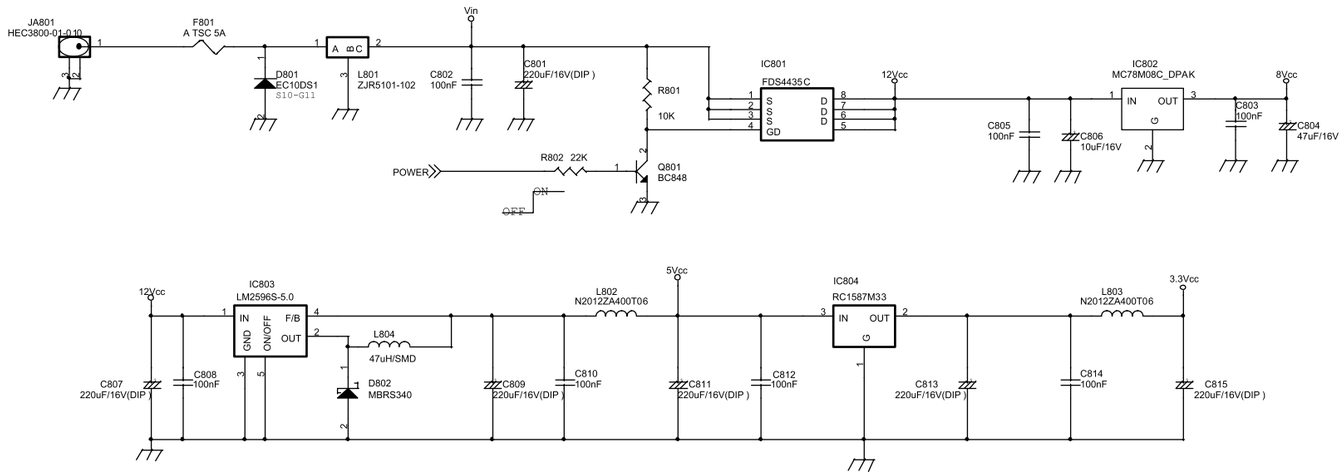


Fig. 2-2-3

3. CIRCUIT DIAGRAMS

3-1. Power Supply Circuit Diagram



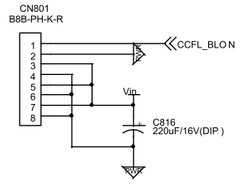


Fig. 2-3-1

3-2. Microprocessor Circuit Diagram

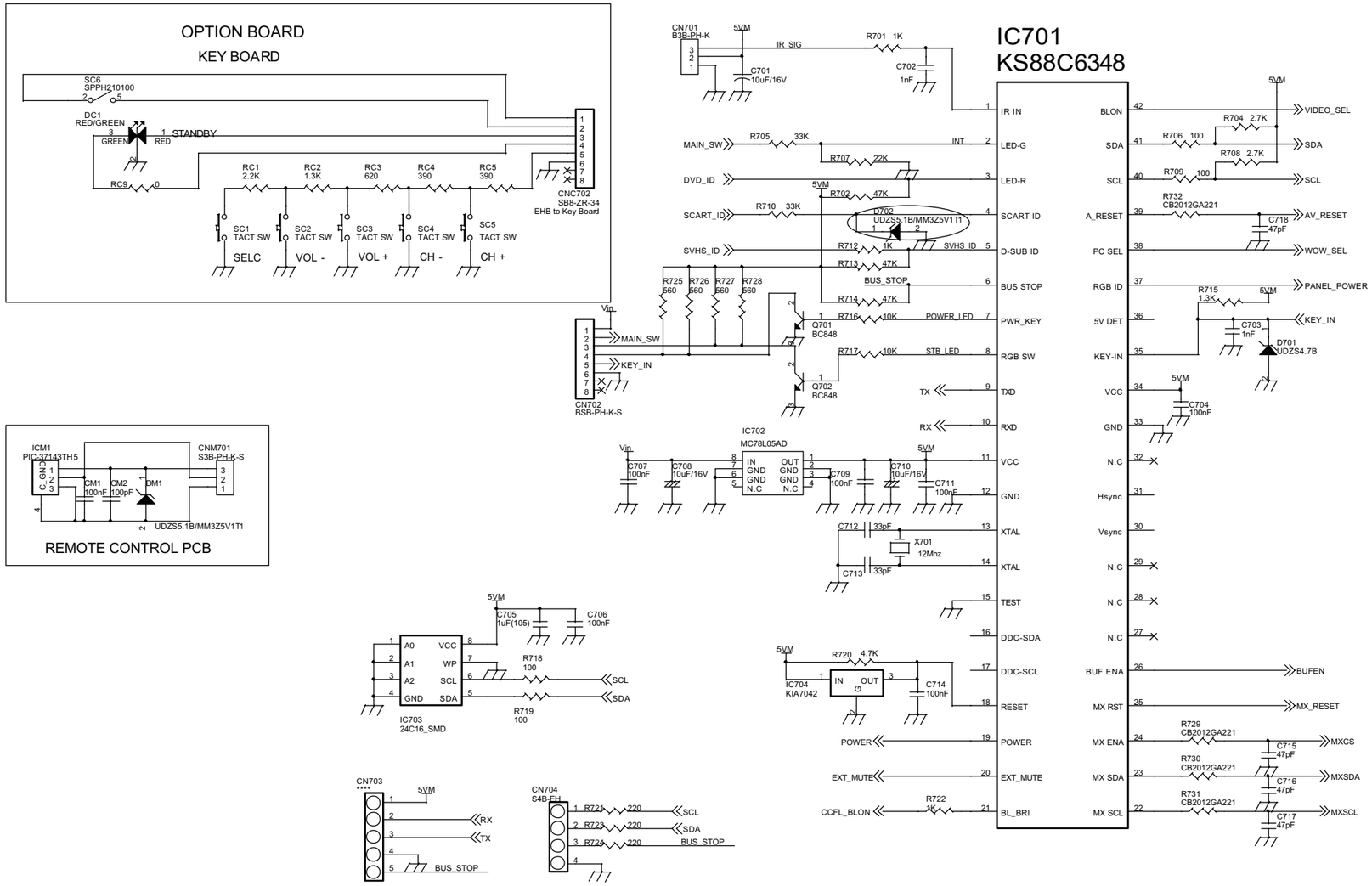


Fig. 2-3-2

3-3. Input Jack Circuit Diagram

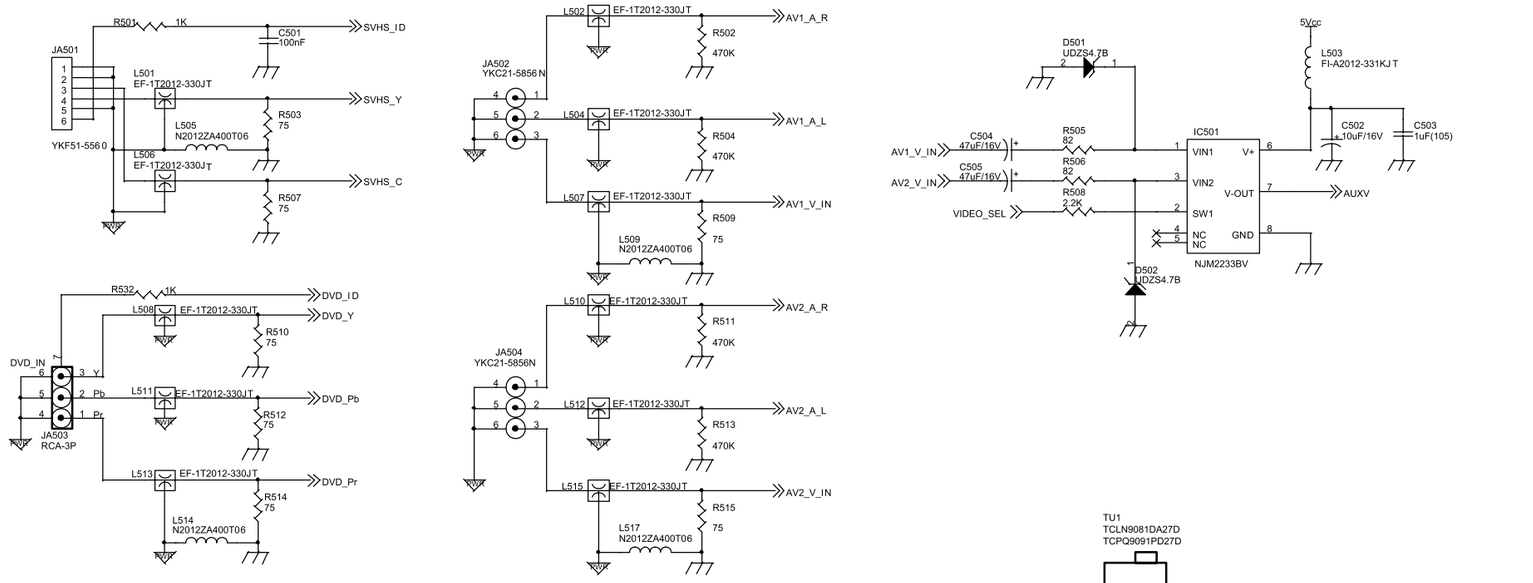


Fig. 2-3-3

A

B

C

D

E

F

G

3-4. VPC3230 Circuit Diagram

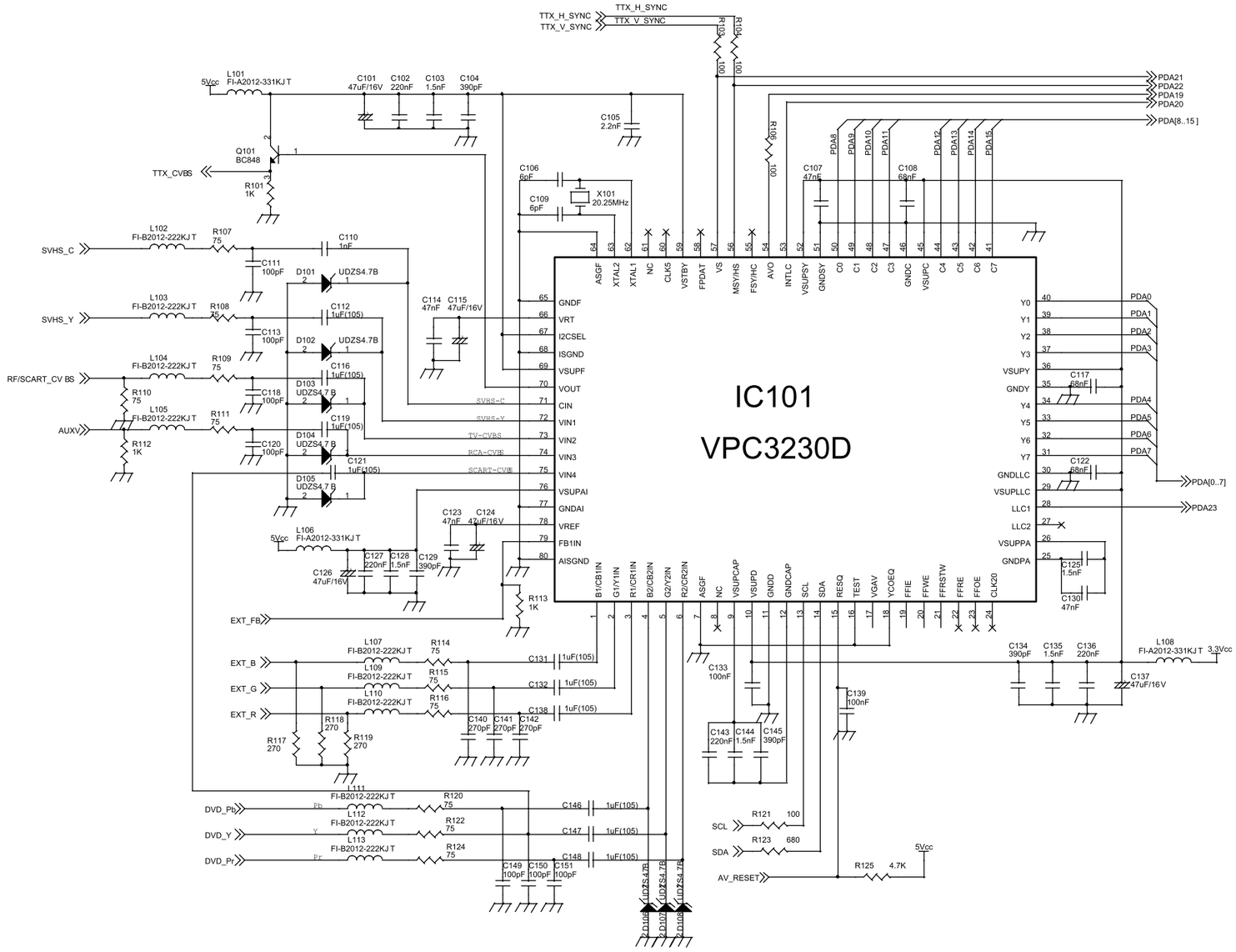


Fig. 2-3-4

A B C D E F G

3-5. TTX&Caption Circuit Diagram

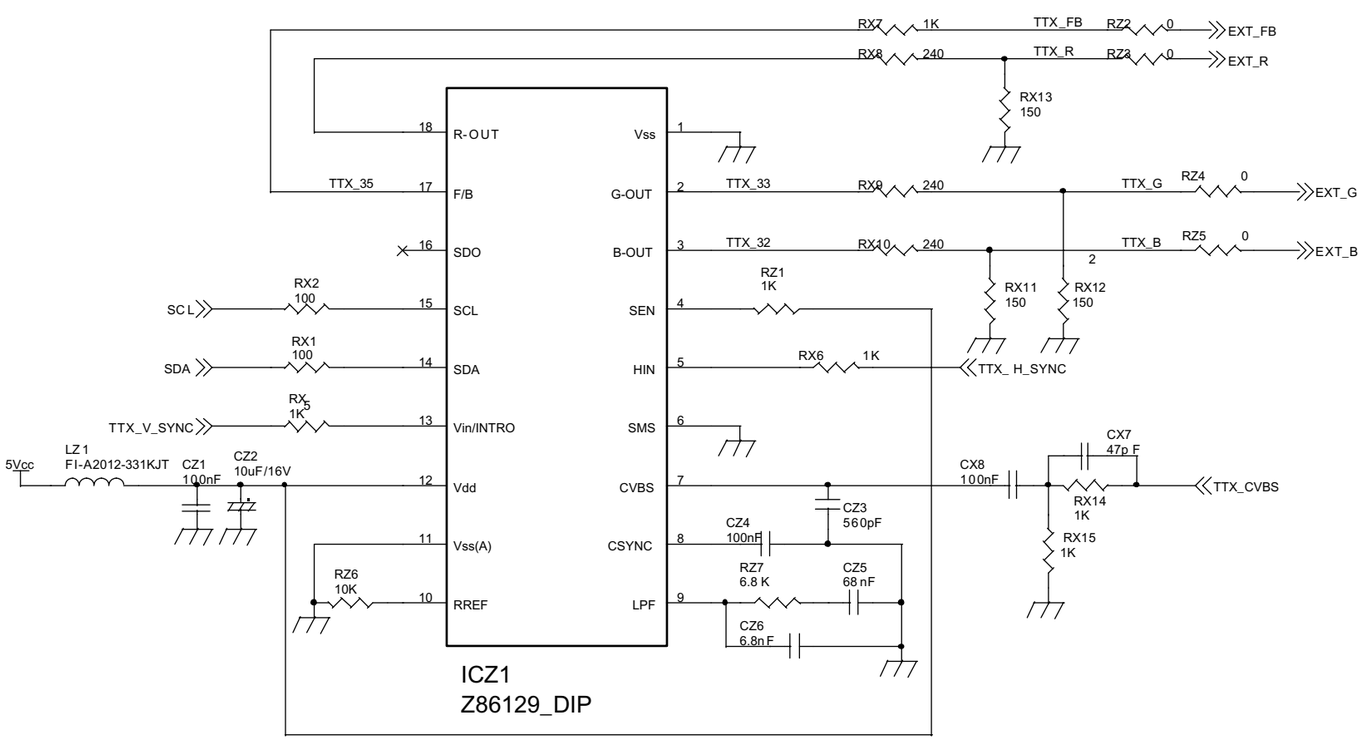


Fig. 2-3-5

3-6. MXIC Circuit Diagram

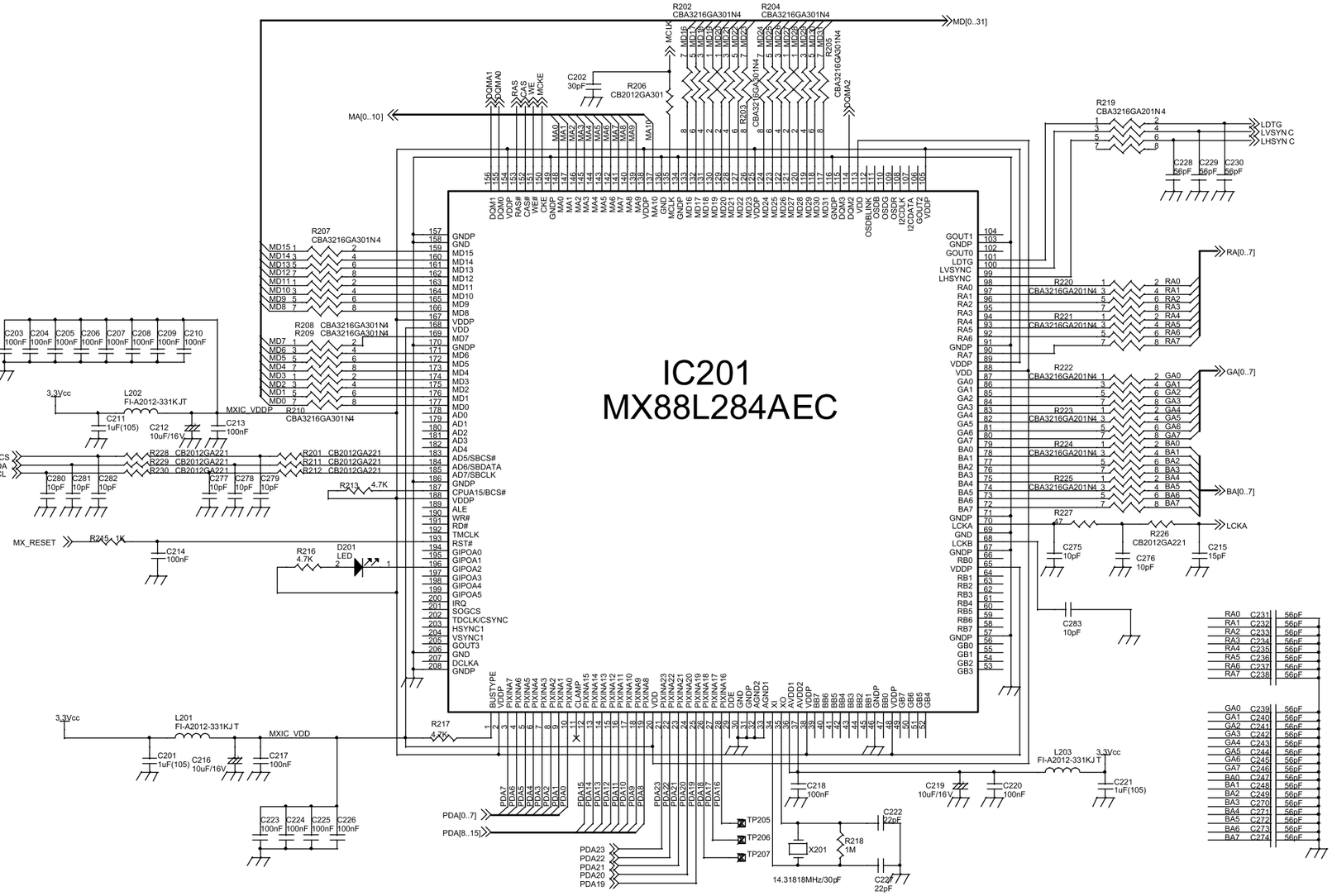


Fig. 2-3-6

A B C D E F G

3-7. Frame Buffer Circuit Diagram

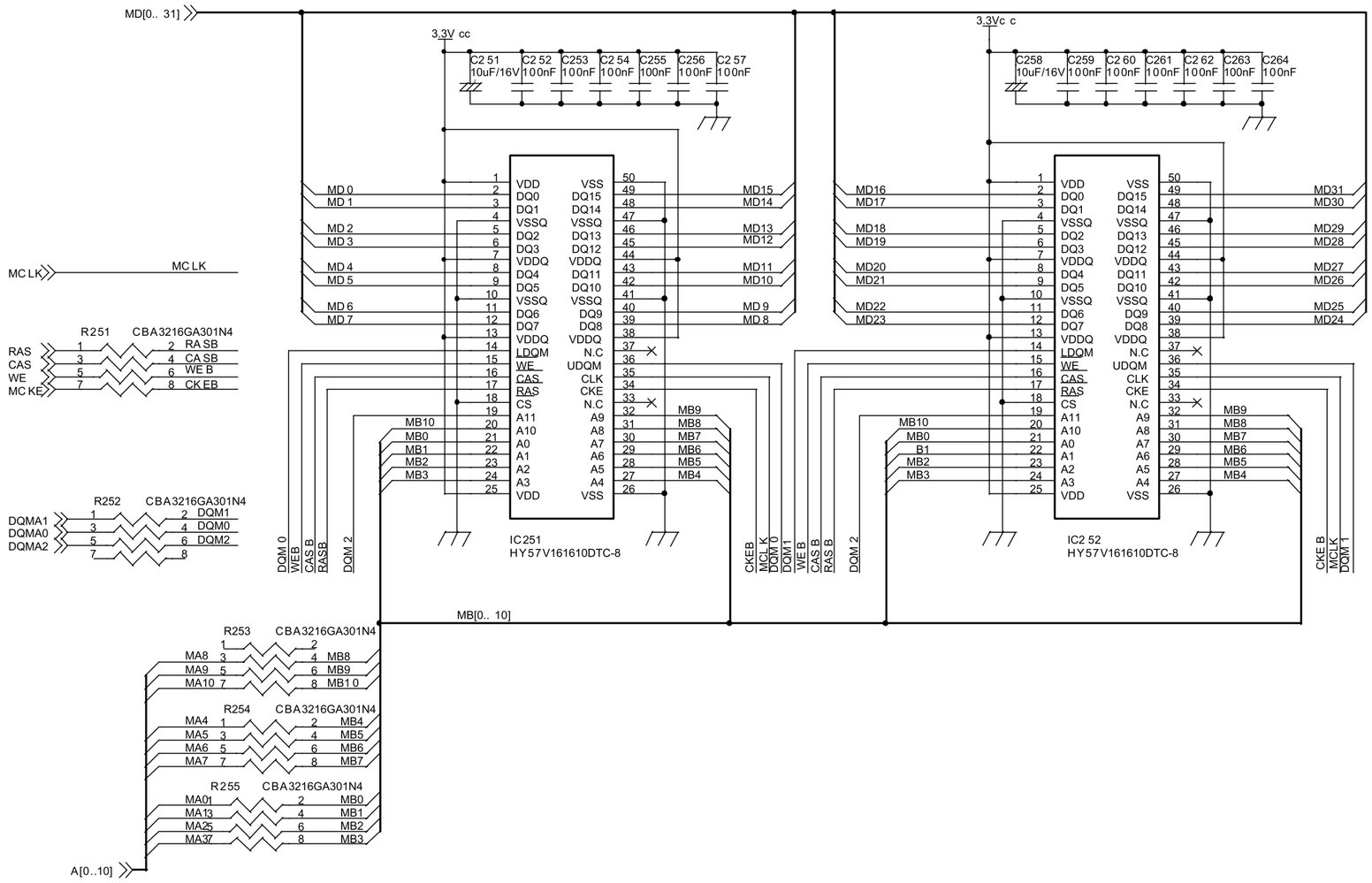


Fig. 2-3-7

3-8. Panel Interface Circuit Diagram

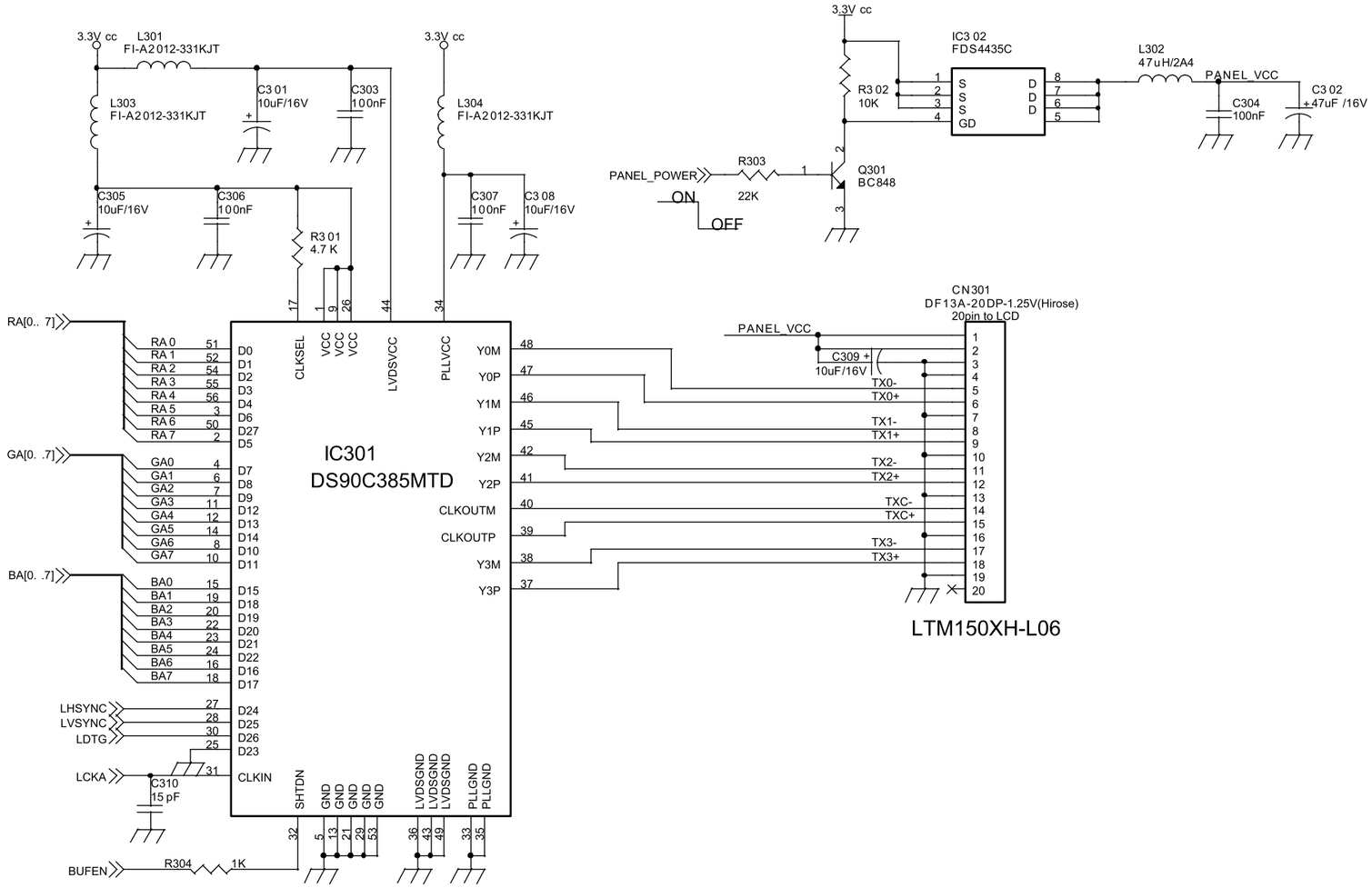


Fig. 2-3-8

A B C D E F G

3-9. Sound Circuit Diagram

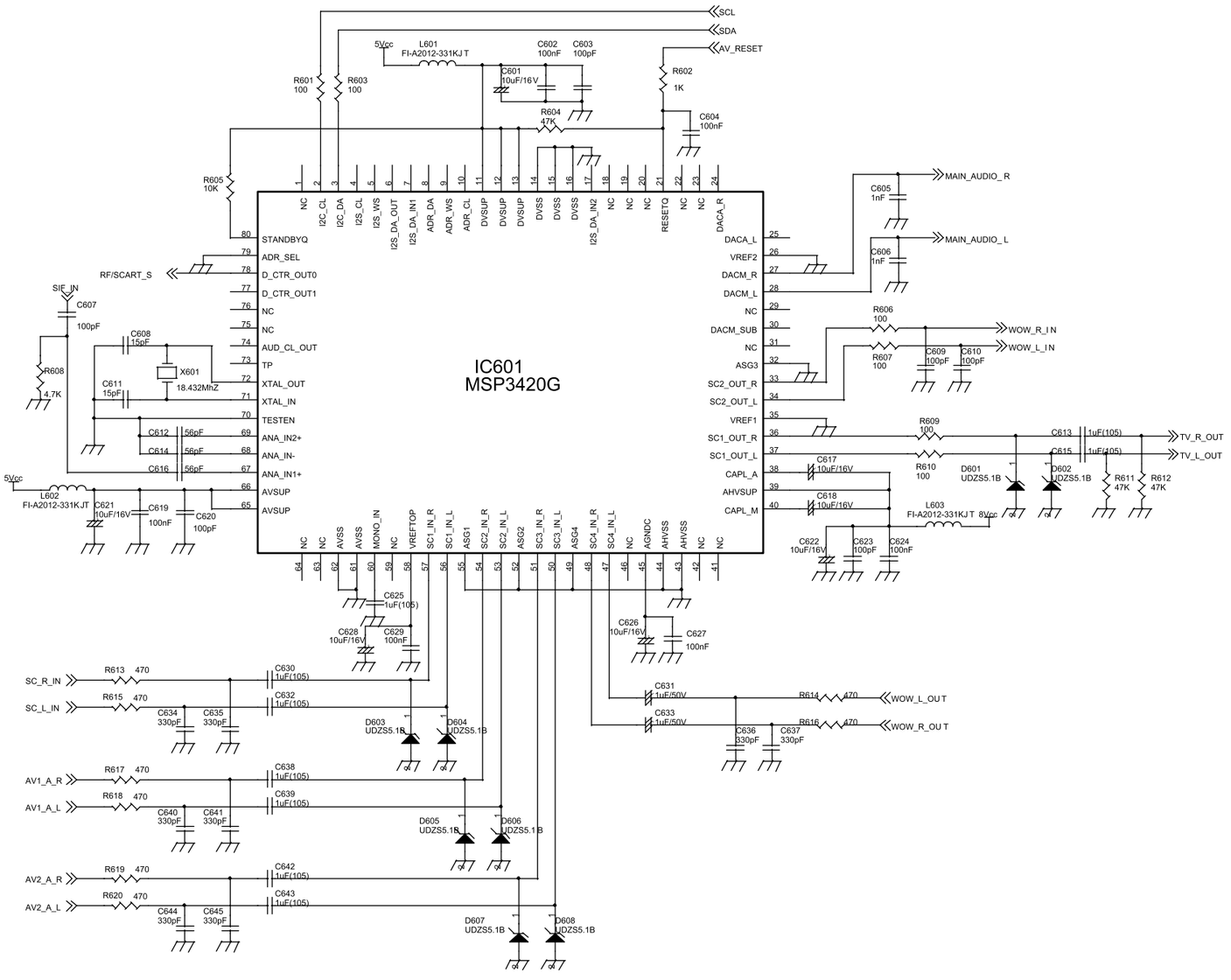


Fig. 2-3-9

3-10. Wow Control Circuit Diagram

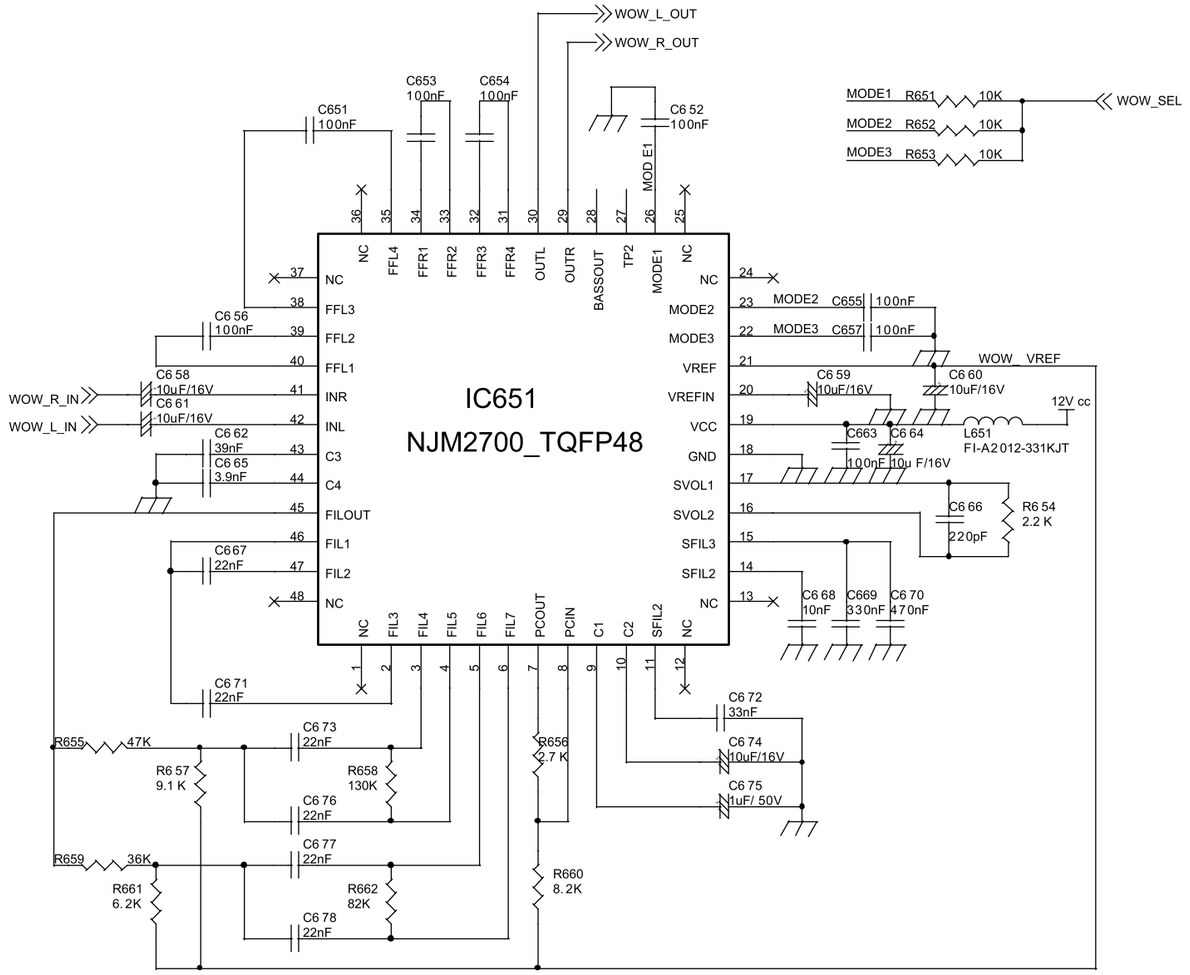


Fig. 2-3-10

3-11. Sound Amplifier Circuit Diagram

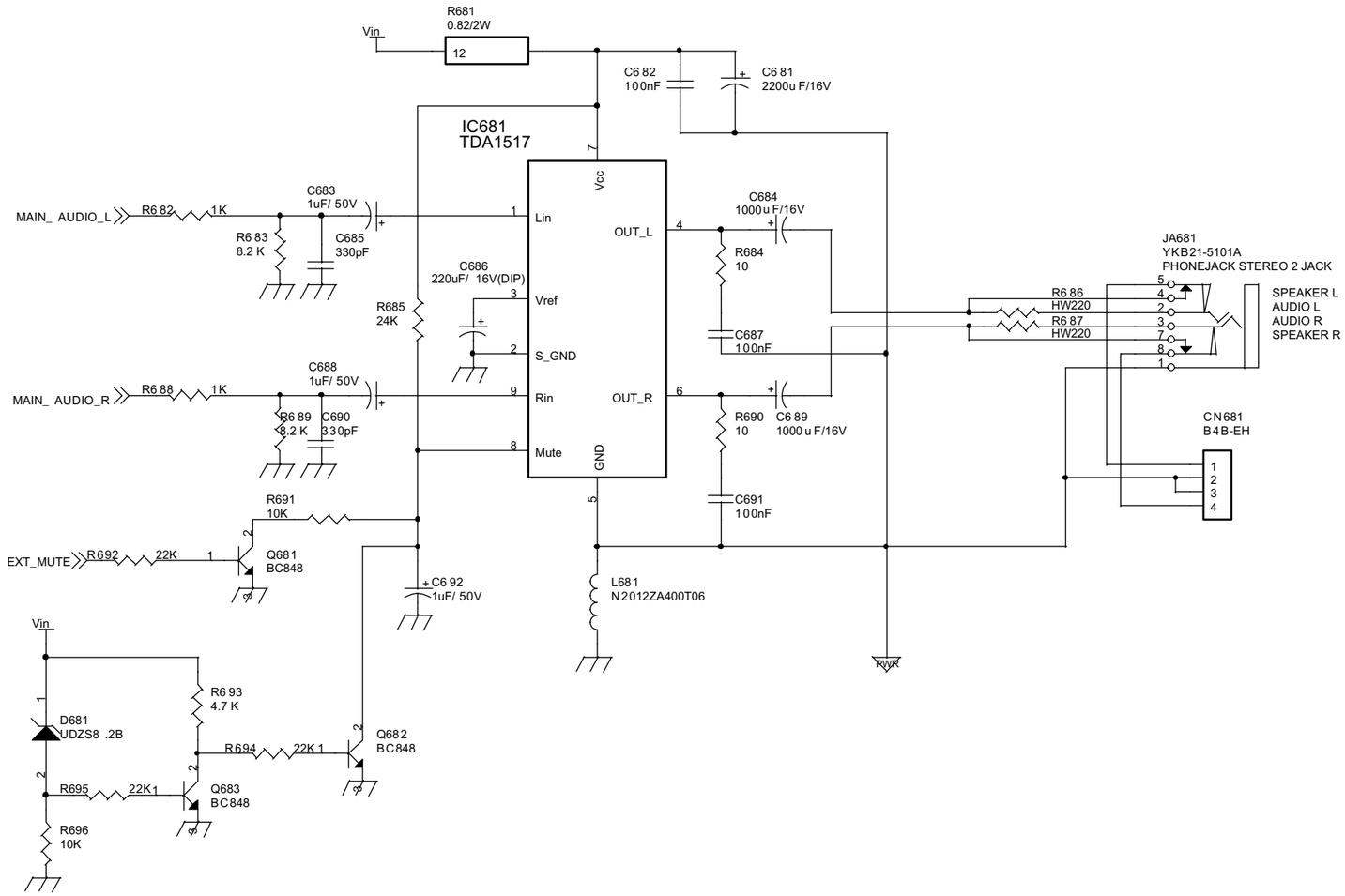


Fig. 2-3-11

3-12. Pin Voltage

Power Circuit (Page 2-7)

IC801(FDS4435) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	12V	5	12V
2	12V	6	12V
3	12V	7	12V
4	0V	8	12V

IC803(LM2596) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	12V	4	5V
2	7.3V	5	0V
3	0V		

Microprocessor Circuit (Page 2-9)

IC701(Microprocessor) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	4.4V	22	4.6V
2	4.7V	23	3.8V
3	0V	24	1.7V
4	0V	25	5V
5	5V	26	5V
6	5V	27	5V
7	5V	28	5V
8	5V	29	0V
9	0V	30	0V
10	5V	31	5V
11	5V	32	0V
12	0V	33	0V
13	2.8V	34	5V
14	2.7V	35	4.8V
15	0V	36	0V
16	0V	37	5V
17	0V	38	5V
18	5V	39	3.9V
19	5V	40	4.2V
20	5V	41	4.4V
21	5V	42	0V

IC702(MC78L05) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	5V	5	0V
2	0V	6	0V
3	0V	7	0V
4	0V	8	12V

IC703(24C16) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	0V	5	4.2V
2	0V	6	4.4V
3	0V	7	0V
4	0V	8	5V

Input Jack Circuit (Page 2-11)

IC501(NJM2233) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	2.7V	5	0V
2	0V	6	5V
3	2.7V	7	1.9V
4	0V	8	0V

IC502(GL3820) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	0V	5	0V
2	3.3V	6	2.9V
3	4.6V	7	12V
4	8.7V	8	2V

TU1(TUNER) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	NC	10	NC
2	NC	11	NC
3	NC	12	NC
4	NC	13	NC
5	4.84V	14	NC
6	4.4V	15	2V
7	4.2V	16	2.9V
8	0V	17	4.84V
9	NC	18	NC

VPC3230 Circuit (Page 2-13)

IC101(VPC3230) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	0V	41	2.3V
2	0V	42	2.3V
3	0V	43	2.3V
4	1.4V	44	2.3V
5	1.4V	45	3.3V
6	1.4V	46	0V
7	0V	47	2.3V
8	0V	48	2.3V
9	3.3V	49	2.3V
10	3.3V	50	2.3V
11	0V	51	0V
12	0V	52	3.3V
13	4.4V	53	2.3V
14	4.2V	54	2.9V
15	3.9V	55	3.0V
16	0V	56	1.4V
17	0V	57	3.2V
18	0V	58	3.3V
19	2.8V	59	5V
20	2.8V	60	3.5V
21	0V	61	0V
22	0V	62	2.8V
23	0V	63	2.6V
24	2.4V	64	0V
25	0V	65	0V
26	3.3V	66	2.5V
27	2.2V	67	5V
28	2.4V	68	0V
29	3.3V	69	5V
30	0V	70	1.7V
31	2V	71	1.5V
32	2V	72	1.5V
33	2V	73	1.4V
34	2V	74	1.4V
35	0V	75	1.4V
36	3.3V	76	5V
37	2.3V	77	0V
38	2.3V	78	2.5V
39	2.3V	79	0V
40	2.3V	80	0V

TTX & CAPTION Circuit (Page 2-15)

ICX1(SAA5264) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	0V	27	0V
2	0V	28	0V
3	0V	29	0V
4	0V	30	0V
5	0V	31	3.3V
6	0V	32	0V
7	0V	33	0V
8	0V	34	0V
9	0V	35	0V
10	0V	36	1.3V
11	0V	37	3.3V
12	0V	38	0V
13	0V	39	3.3V
14	5V	40	0V
15	5V	41	2V
16	0V	42	2.1V
17	0V	43	0V
18	0V	44	3.3V
19	0V	45	0V
20	0V	46	0V
21	0V	47	0V
22	0V	48	0V
23	1.1V	49	4.2V
24	0V	50	4.4V
25	0.7V	51	0V
26	1.2V	52	0V

ICX2(24C02) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	0V	5	5V
2	0V	6	5V
3	0V	7	0V
4	0V	8	5V

ICS1(TEA5114) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	3.6V	9	0V
2	0V	10	0V
3	3.6V	11	3V
4	3.6V	12	0V
5	3.6V	13	3V
6	3.6V	14	12V
7	3.6V	15	0V
8	0V	16	3V

MXIC Circuit (Page 2-17)

MX88L284 PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE	PIN	VOLTAGE
1	3.3V	53	0V	105	3.3V	157	0V
2	3.3V	54	0V	106	0V	158	0V
3	2.4V	55	0V	107	3.2V	159	2.8V
4	2.4V	56	0V	108	0V	160	2.8V
5	2.4V	57	0V	109	2.4V	161	2.9V
6	2.4V	58	0V	110	2.4V	162	3.0V
7	2.4V	59	0V	111	0V	163	3.0V
8	2.4V	60	0V	112	0V	164	3.1V
9	2.4V	61	0V	113	3.3V	165	3.3V
10	2.4V	62	0V	114	2.6V	166	3.3V
11	3.1V	63	0V	115	0V	167	3.3V
12	3.3V	64	0V	116	0V	168	3.3V
13	2.3V	65	0V	117	3.0V	169	3.3V
14	2.3V	66	0V	118	3.1V	170	0V
15	2.3V	67	0V	119	3.1V	171	2.2V
16	2.3V	68	1.8V	120	3.0V	172	2.4V
17	2.2V	69	0V	121	3.2V	173	2.4V
18	2.2V	70	1.8V	122	3.2V	174	2.5V
19	2.2V	71	0V	123	3.2V	175	2.7V
20	3.2V	72	1.7V	124	3.2V	176	2.8V
21	2.4V	73	1.7V	125	3.3V	177	2.8V
22	1.4V	74	1.7V	126	2.5V	178	2.4V
23	3.2V	75	1.7V	127	2.5V	179	0V
24	2.3V	76	1.7V	128	2.5V	180	0V
25	0V	77	1.7V	129	2.5V	181	0V
26	0V	78	1.7V	130	2.5V	182	0V
27	0V	79	1.7V	131	2.5V	183	4.8V
28	0V	80	1.7V	132	2.5V	184	4.9V
29	0V	81	1.7V	133	2.5V	185	4.9V
30	0V	82	1.7V	134	0V	186	0V
31	0V	83	1.7V	135	2V	187	3.2V
32	0V	84	1.7V	136	0V	188	3.2V
33	0V	85	1.7V	137	1.7V	189	2.3V
34	2.1V	86	1.7V	138	3.3V	190	0V
35	2.8V	87	1.7V	139	1.5V	191	2.3V
36	3.3V	88	3.3V	140	1.3V	192	0V
37	3.3V	89	3.3V	141	2.5V	193	5.0V
38	0V	90	1.7V	142	2.5V	194	3.2V
39	0V	91	0V	143	2.5V	195	3.2V
40	0V	92	1.7V	144	2.5V	196	3.0V
41	0V	93	1.7V	145	2.5V	197	0V
42	0V	94	1.7V	146	2.5V	198	0V
43	0V	95	1.7V	147	2.5V	199	0V
44	0V	96	1.7V	148	2.5V	200	3.2V
45	0V	97	1.7V	149	0V	201	0V
46	0V	98	1.7V	150	3.2V	202	0V
47	0V	99	2.2V	151	3.0V	203	0V
48	3.3V	100	0.3V	152	3.0V	204	0V
49	0V	101	2.3V	153	2.8V	205	0V
50	0V	102	0V	154	3.3V	206	0V
51	0V	103	0V	155	1.8V	207	0V
52	0V	104	0V	156	1.8V	208	0V

Frame Buffer Circuit (Page 2-19)

IC251(SDRAM) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	3.3V	26	0V
2	2.4V	27	3.1V
3	2.4V	28	3.1V
4	0V	29	3.1V
5	2.4V	30	3.1V
6	2.4V	31	1.7V
7	3.3V	32	1.7V
8	2.4V	33	0V
9	2.4V	34	3.2V
10	0V	35	1.6V
11	2.4V	36	2.2V
12	2.4V	37	0V
13	3.3V	38	3.3V
14	2.3V	39	3.2V
15	3.5V	40	3.2V
16	3.6V	41	0V
17	3.6V	42	3.1V
18	0V	43	3.0V
19	3.3V	44	3.3V
20	2.3V	45	3.0V
21	3.3V	46	3.0V
22	3.4V	47	0V
23	3.1V	48	2.7V
24	3.3V	49	2.7V
25	3.3V	50	0V

IC252(SDRAM) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	3.3V	26	0V
2	2.4V	27	3.1V
3	2.4V	28	3.1V
4	0V	29	3.1V
5	2.4V	30	3.1V
6	2.4V	31	1.7V
7	3.3V	32	1.7V
8	2.4V	33	0V
9	2.4V	34	3.2V
10	0V	35	1.6V
11	2.4V	36	2.2V
12	2.4V	37	0V
13	3.3V	38	3.3V
14	2.3V	39	3.2V
15	3.5V	40	3.2V
16	3.6V	41	0V
17	3.6V	42	3.1V
18	0V	43	3.0V
19	3.3V	44	3.3V
20	2.3V	45	3.0V
21	3.3V	46	3.0V
22	3.4V	47	0V
23	3.1V	48	2.7V
24	3.3V	49	2.7V
25	3.3V	50	0V

Panel Interface Circuit (Page 2-21)

IC301(DS90CF385) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	3.3V	29	0V
2	1.7V	30	2.3V
3	1.7V	31	1.8V
4	1.7V	32	5V
5	0V	33	0V
6	1.7V	34	3.3V
7	1.7V	35	0V
8	1.7V	36	0V
9	3.3V	37	1.2V
10	1.7V	38	1.4V
11	1.7V	39	1.4V
12	1.7V	40	1.3V
13	0V	41	1.3V
14	1.7V	42	1.4V
15	1.7V	43	0V
16	1.7V	44	3.3V
17	3.3V	45	1.3V
18	1.7V	46	1.4V
19	1.7V	47	1.3V
20	1.7V	48	1.4V
21	0V	49	0V
22	1.7V	50	1.7V
23	1.7V	51	1.7V
24	1.7V	52	1.7V
25	0V	53	0V
26	3.3V	54	1.7V
27	2.2V	55	1.7V
28	0.3V	56	1.7V

IC302(FDS4435) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	3.26V	5	3.25V
2	3.26V	6	3.25V
3	3.26V	7	3.25V
4	0V	8	3.25V

Sound Circuit (Page 2-23)

IC601(MSP3410G) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	0V	41	0V
2	4.4V	42	0V
3	4.2V	43	0V
4	3.5V	44	0V
5	3.5V	45	3.7V
6	3.5V	46	0V
7	0V	47	3.7V
8	0V	48	3.7V
9	0V	49	0V
10	0V	50	3.7V
11	4.9V	51	3.7V
12	4.9V	52	0V
13	4.9V	53	3.7V
14	0V	54	3.7V
15	0V	55	0V
16	0V	56	3.7V
17	0V	57	3.7V
18	0V	58	3.7V
19	0V	59	0V
20	0V	60	3.7V
21	3.8V	61	0V
22	0V	62	0V
23	0V	63	0V
24	0V	64	0V
25	0V	65	4.9V
26	0V	66	4.9V
27	1.5V	67	1.6V
28	1.5V	68	0V
29	0V	69	0V
30	2.1V	70	0V
31	0V	71	2.9V
32	0V	72	2.6V
33	3.8V	73	0V
34	3.8V	74	2.9V
35	0V	75	0V
36	3.8V	76	0V
37	3.8V	77	0V
38	6.3V	78	RF:4.8V,VIDEO1:0V
39	8V	79	0V
40	6.3V	80	4.9V

WOW Control Circuit (Page2-25)

IC651(NJM2700) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	0V	25	0V
2	6.0V	26	4.6V
3	6.0V	27	0V
4	6.0V	28	6.0V
5	6.0V	29	6.0V
6	6.0V	30	6.0V
7	6.0V	31	6.0V
8	6.0V	32	6.0V
9	0V	33	6.0V
10	0V	34	6.0V
11	6.0V	35	6.0V
12	0V	36	0V
13	0V	37	0V
14	6.0V	38	0.9V
15	6.0V	39	0.9V
16	6.0V	40	0.9V
17	6.0V	41	0.9V
18	0V	42	0.9V
19	12V	43	0.9V
20	6.0V	44	0.9V
21	6.0V	45	0.9V
22	4.6V	46	0.9V
23	4.6V	47	0.9V
24	0V	48	0V

Sound AMP Circuit (Page2-27)

IC681(TDA1517) PIN VOLTAGE

PIN	VOLTAGE	PIN	VOLTAGE
1	2.1V	6	5.8V
2	0V	7	12V
3	5.8V	8	11.7V
4	5.7V	9	2.1V
5	0V		

Others

3Pin Regulator & Other

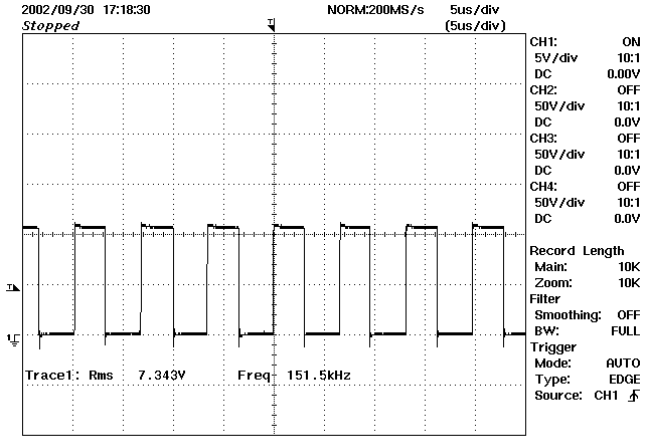
LOC NO	Pin1	Pin2	Pin3
IC802	12V	0V	8V
IC804	0V	3.3V	5V
IC704	5V	0V	5V
ICM1	5V	4.46V	0V
DC1	0V	0V	0V

2Pin Diode & LED

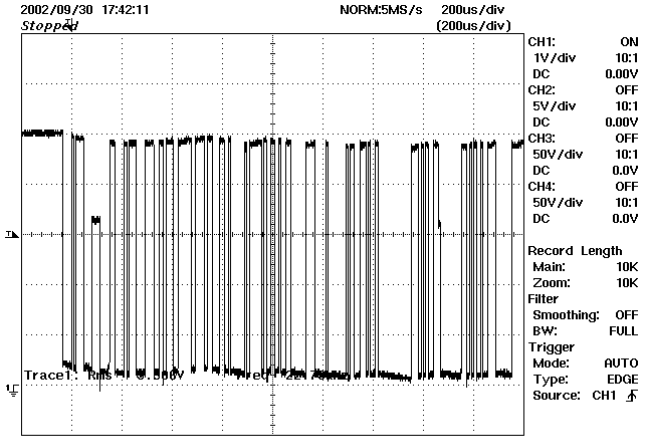
LOC NO	Pin1	Pin2
DC2	2.8V	5.5V
DC3	0V	2.8V
DC4	5.5V	2.8V
DC5	2.8V	0V
D681	12V	4V

3-13. Waveforms

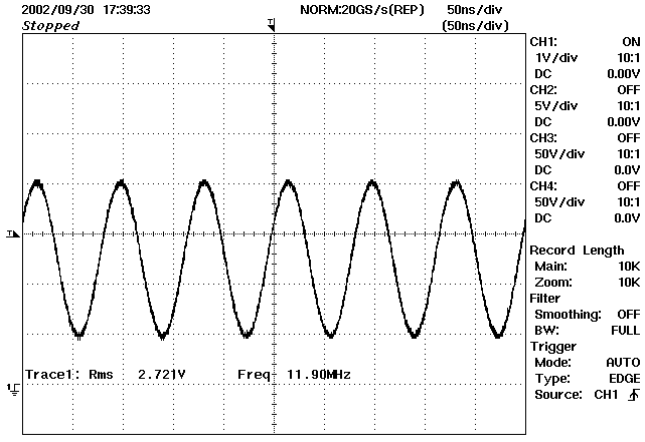
IC803 PIN2 Power Circuit (Page 2-7)



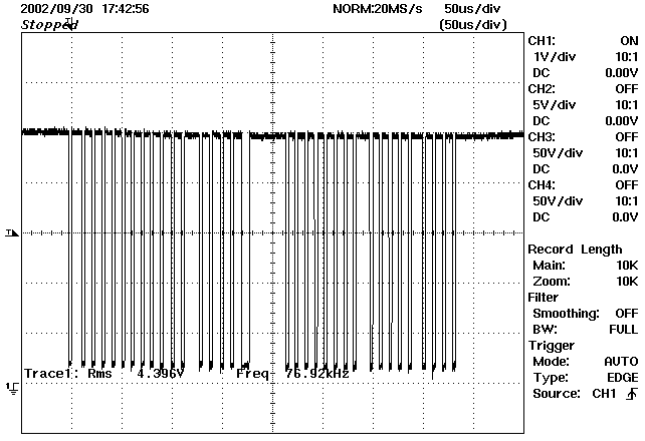
IC701 PIN23 Microprocessor Circuit (Page 2-9)



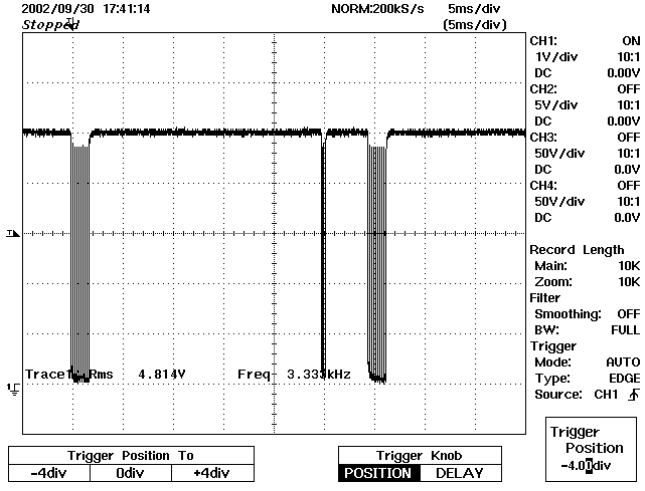
IC701 PIN14 Microprocessor Circuit (Page 2-9)



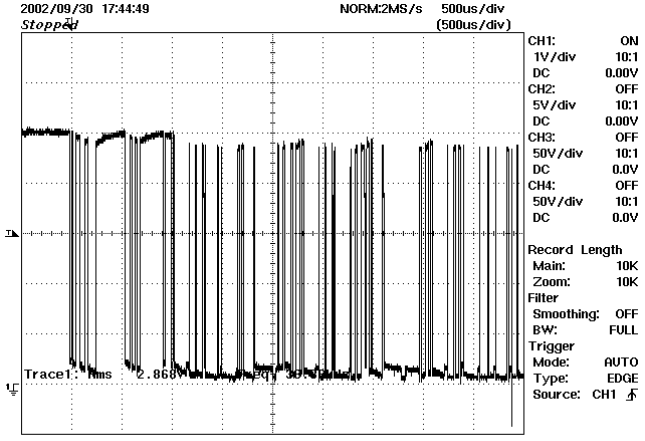
IC701 PIN22 Microprocessor Circuit (Page 2-9)



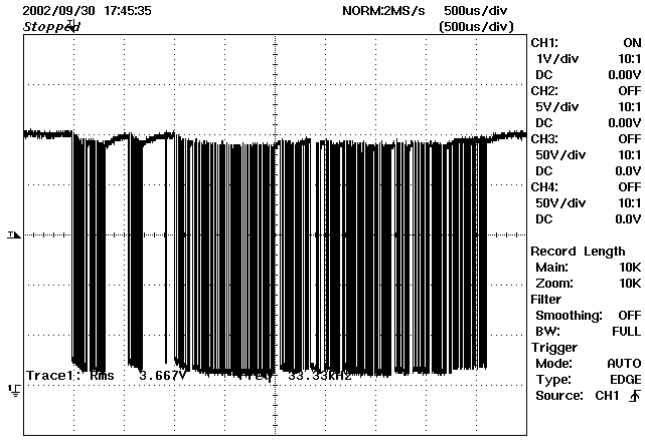
IC701 PIN24 Microprocessor Circuit (Page 2-9)



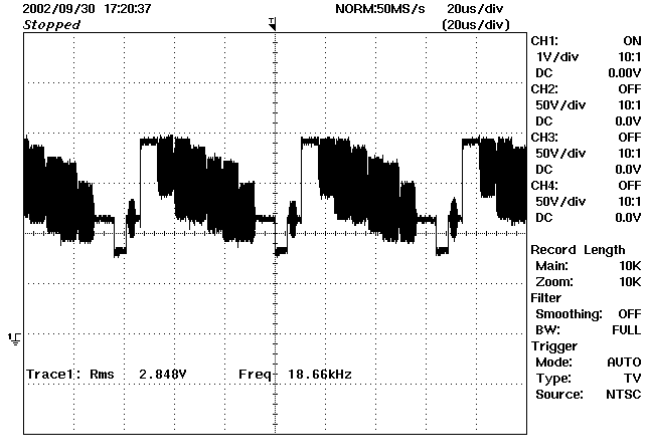
IC701 PIN41 Microprocessor Circuit (Page 2-9)



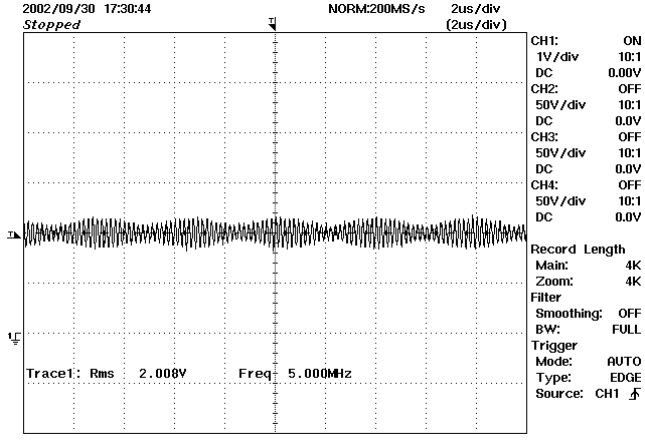
IC701 PIN40 Microprocessor Circuit (Page 2-9)



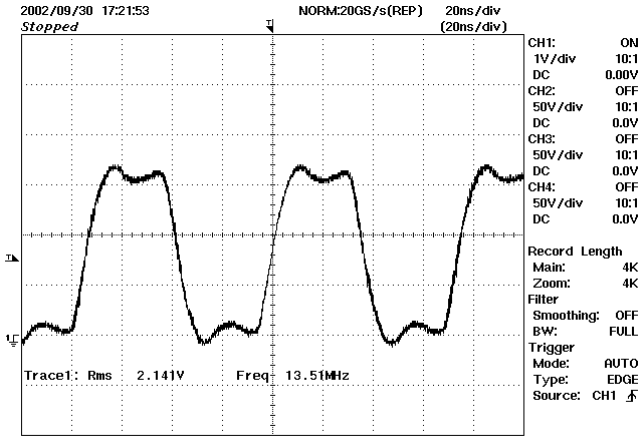
TU1 PIN16 Input Jack Circuit (Page 2-11)



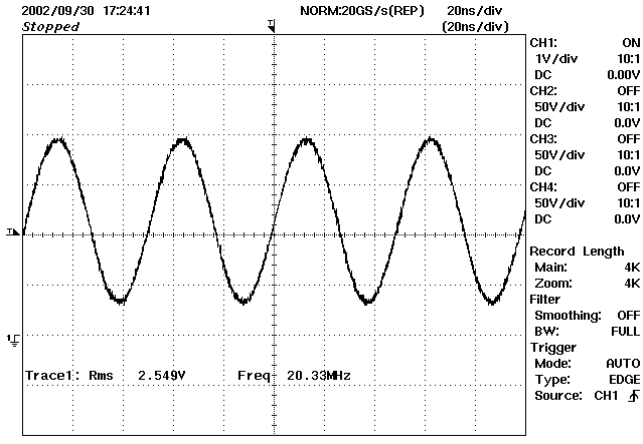
TU1 PIN15 Input Jack Circuit (Page 2-11)



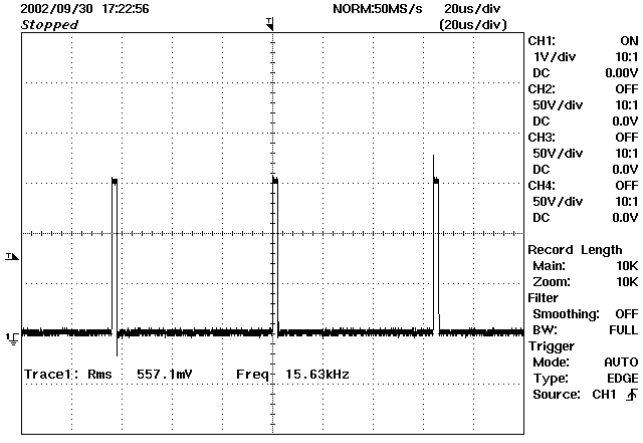
IC101 PIN28 VPC3230 Circuit (Page 2-13)



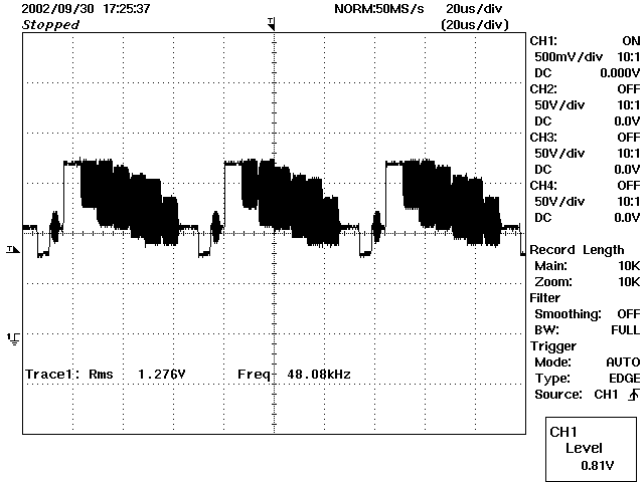
IC101 PIN62 VPC3230 Circuit (Page 2-13)



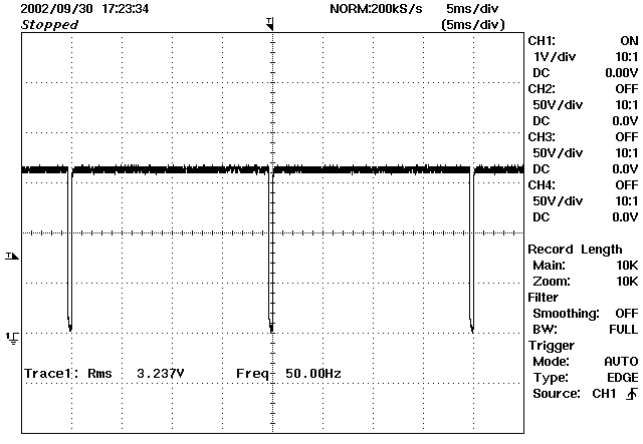
IC101 PIN56 VPC3230 Circuit (Page 2-13)



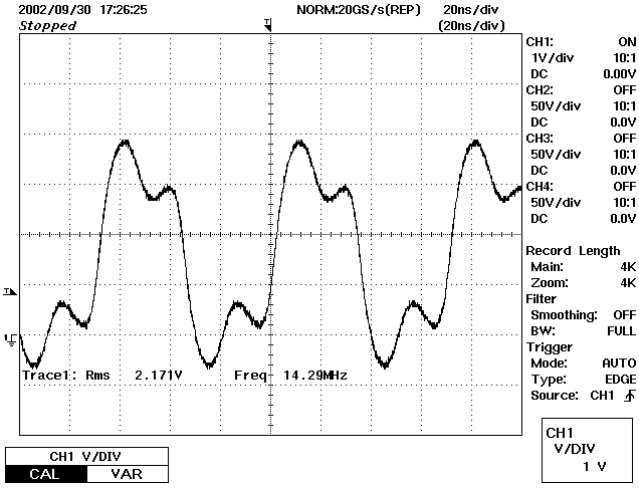
IC101 PIN73 VPC3230 Circuit (Page 2-13)



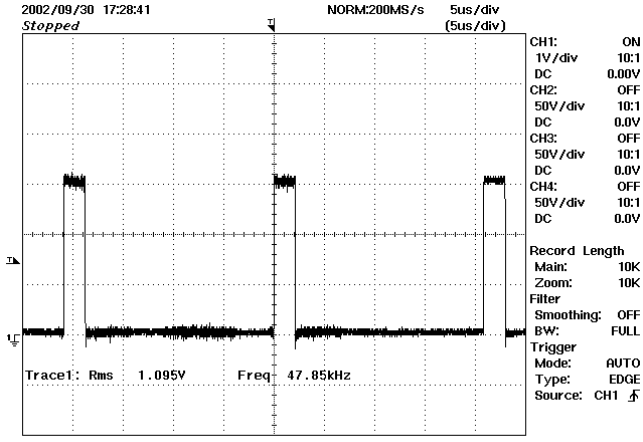
IC101 PIN57 VPC3230 Circuit (Page 2-13)



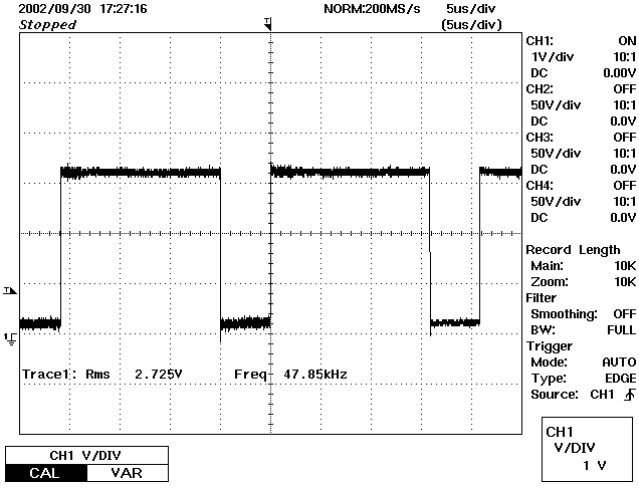
IC201 PIN35 MXIC Circuit (Page 2-17)



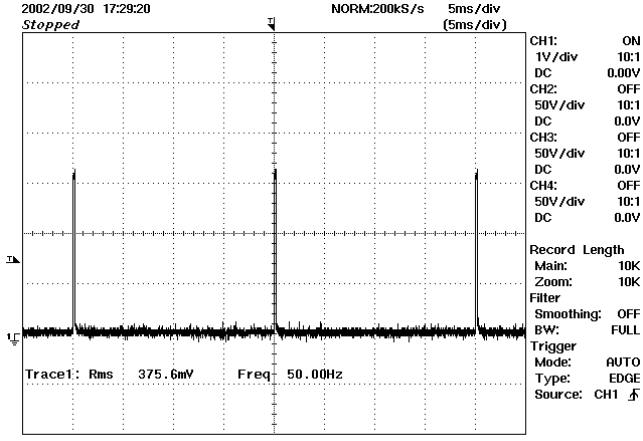
IC201 PIN99 MXIC Circuit (Page 2-17)



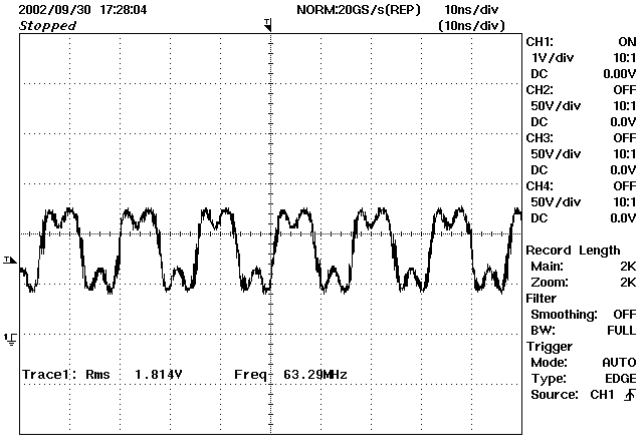
IC201 PIN101 MXIC Circuit (Page 2-17)



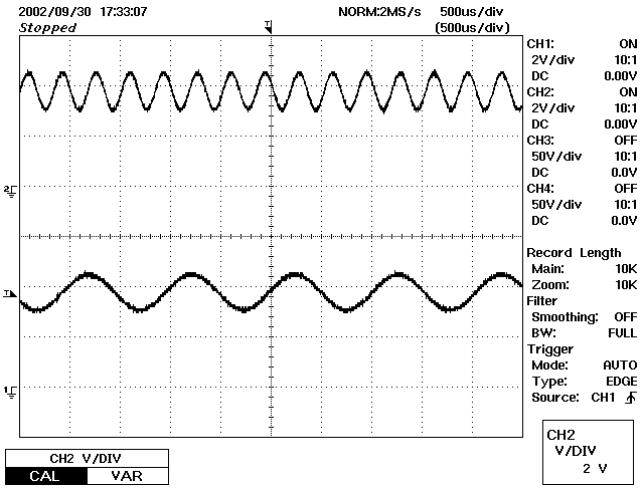
IC201 PIN100 MXIC Circuit (Page 2-17)



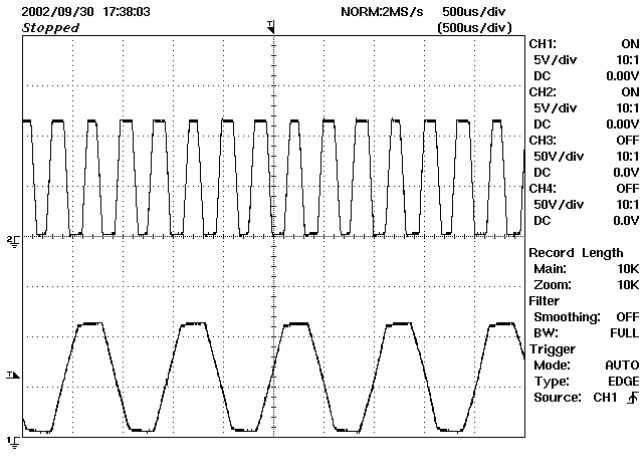
IC201 PIN70 MXIC Circuit (Page 2-17)



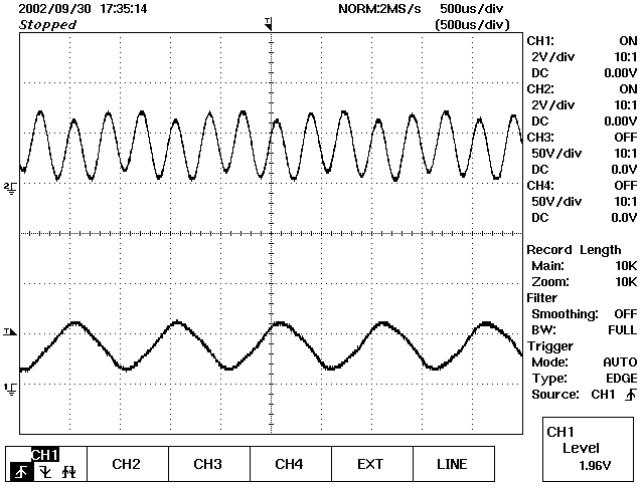
IC601 PIN33,34 Sound Circuit (Page 2-23)



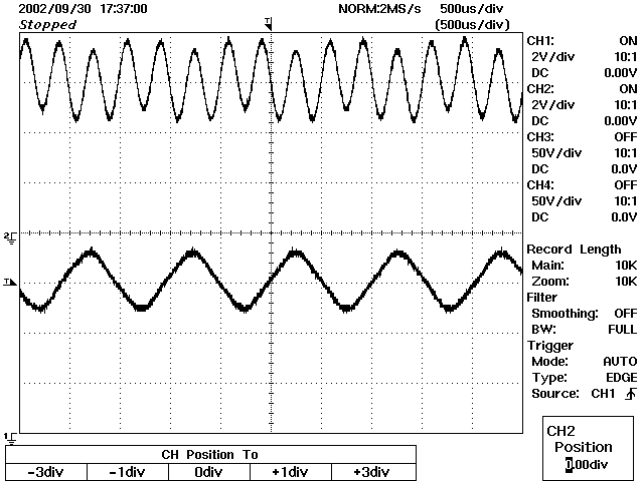
IC681 PIN6,4 Sound AMP Circuit (Page 2-27)



IC601 PIN27,28 Sound Circuit (Page 2-23)



IC651 PIN29,30 WOW Control Circuit (Page 2-25)



4. PC BOARDS

4-1. Main PC Board

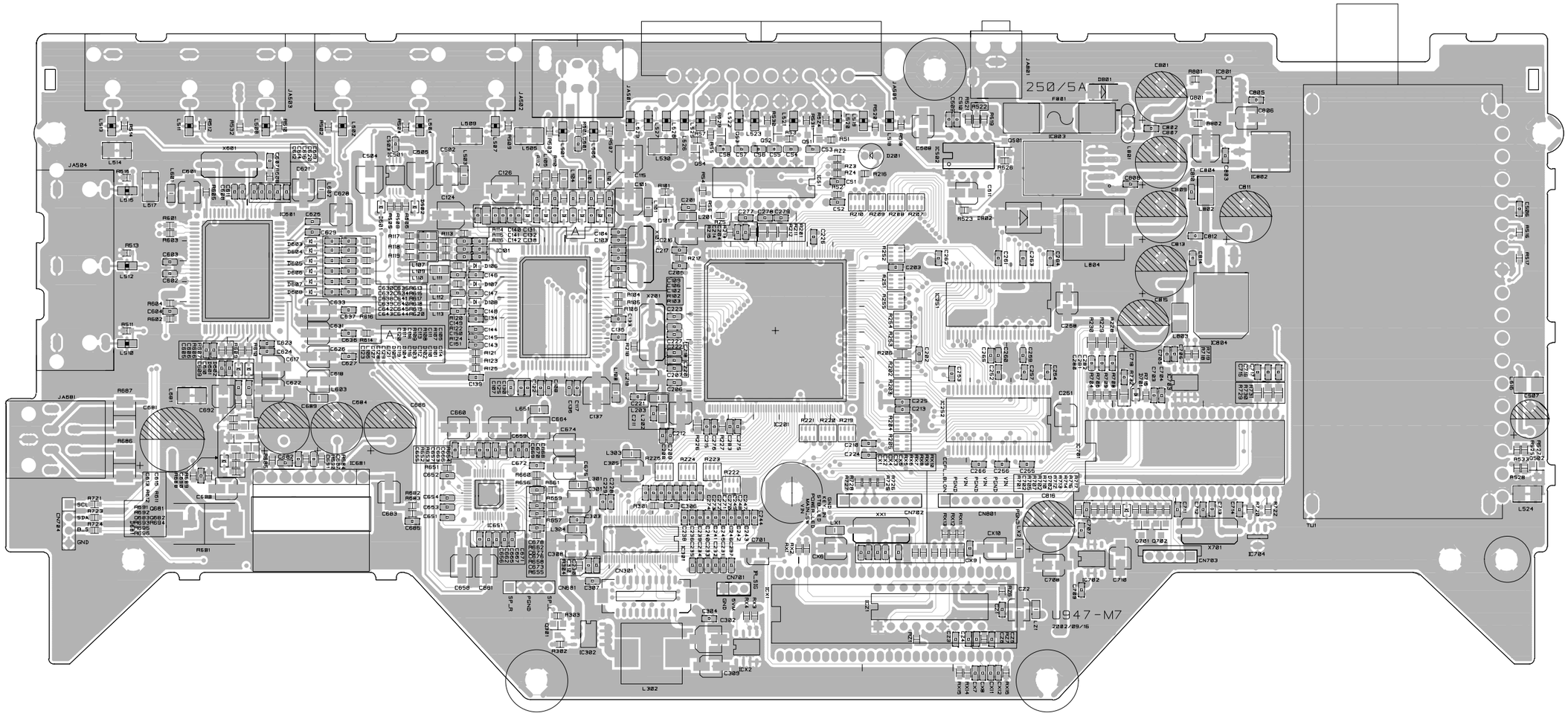


Fig. 2-4-1 U001 Main PC board (Top side)

	1	2	3	4	5	6	7	8	9	10
A										
B										
C										
D										
E										
F										
G										

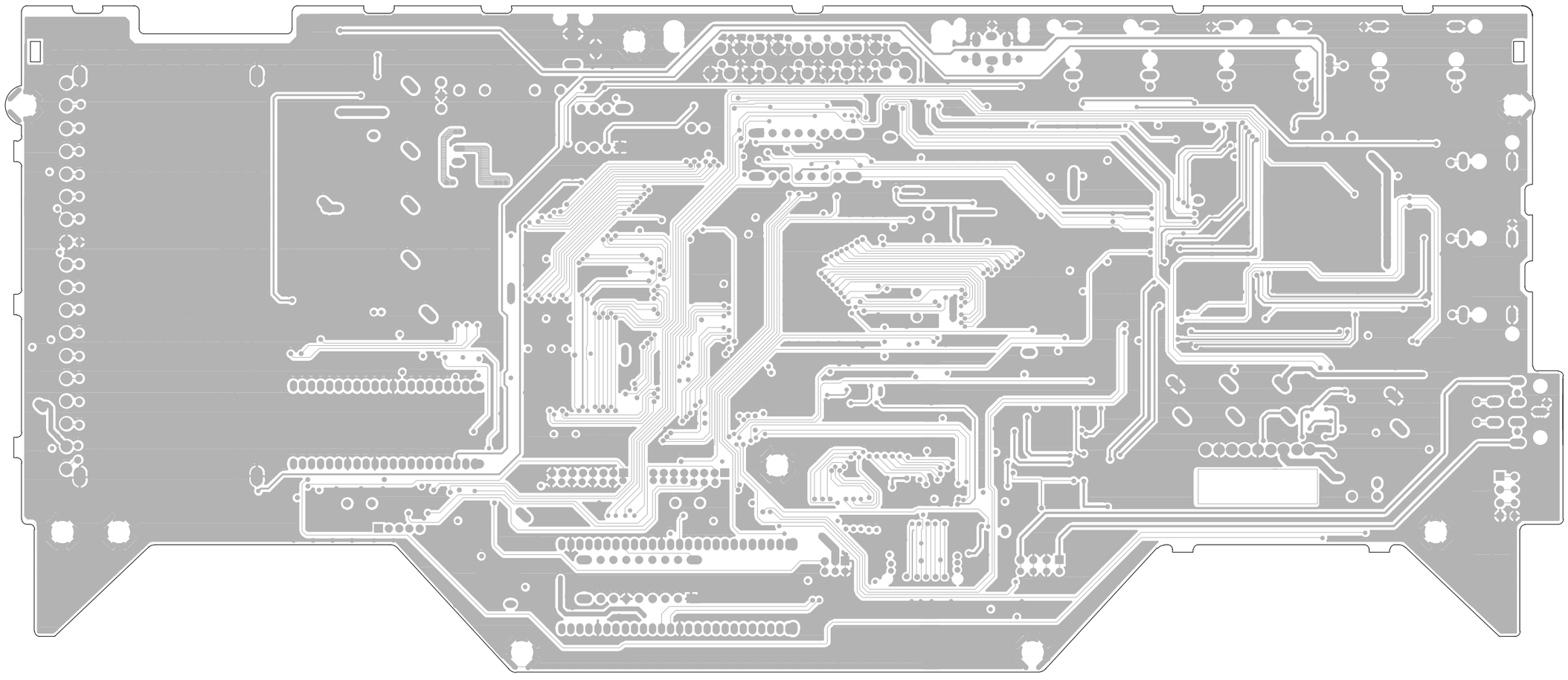


Fig. 2-4-2 U001 Main PC board (Bottom side)

4-2. Switch PC Board

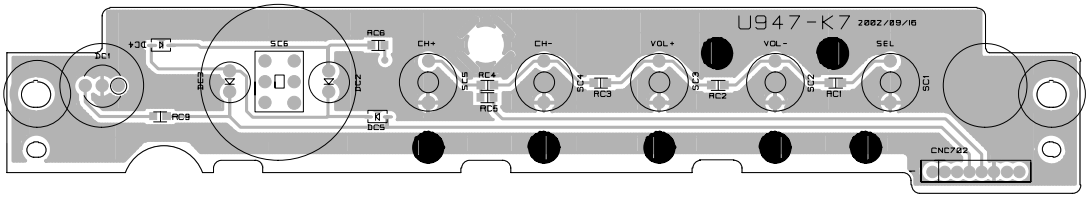


Fig. 2-4-3 U002 Switch PC Board (Top side)

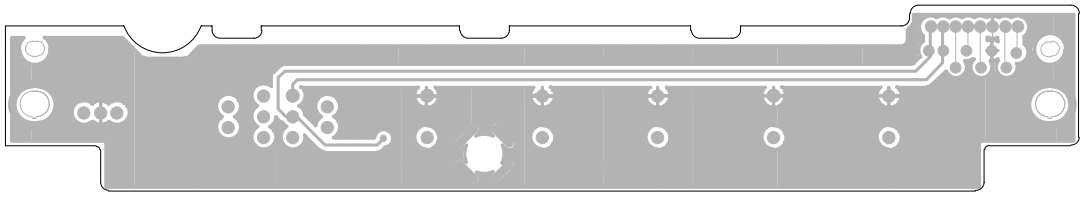


Fig. 2-4-4 U002 Switch PC Board (Bottom side)

4-3. Sensor PC Board

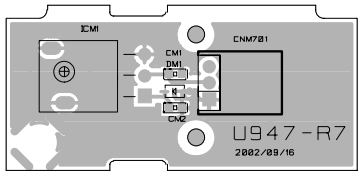


Fig. 2-4-5 U003 Sensor PC Board (Top side)

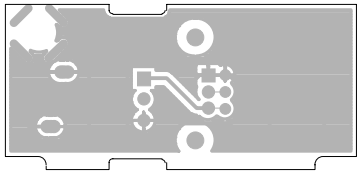


Fig. 2-4-6 U003 Sensor PC Board (Bottom side)

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SECTION 3
PARTS LIST

SAFETY PRECAUTION

The parts identified by ! (⚠) mark are critical for safety. Replace only with part number specified.

The mounting position of replacement is to be identical with originals.

The substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

NOTICE

The part number must be used when ordering parts in order to assist in processing, be sure to include the model number and description.

ABBREVIATIONS

1. Integrated Circuit (IC)

2. Capacitor (Cap)

- **Capacitance Tolerance (for Nominal Capacitance more than 10pF)**

Table 3-2-1

Symbol	B	C	D	F	G	J	K	M	N
Tolerance %	± 0.1	± 0.25	± 0.5	± 1	± 2	± 5	± 10	± 20	± 30

Symbol	P	Q	T	U	V	W	X	Y	Z
Tolerance %	+ 100 0	+ 30 – 10	+ 50 – 10	+ 75 – 10	+ 20 – 10	+ 100 – 10	+ 40 – 20	+ 150 – 10	+ 80 – 20

Ex. 10µF J = 10µF ± 5%

- **Capacitance Tolerance (for Nominal Capacitance 10pF or less)**

Table 3-2-2

Symbol	B	C	D	F	G
Tolerance pF	± 0.1	± 0.25	± 0.5	± 1	± 2

Ex. 10pF G = 10pF ± 2pF

3. Resistor (Res)

- **Resistance tolerance**

Table 3-3-1

Symbol	B	C	D	F	G	J	K	M
Tolerance %	± 0.1	± 0.25	± 0.5	± 1	± 2	± 5	± 10	± 20

Ex. 470ΩJ = 470Ω± 5%

4. EXPLODED VIEWS

4-1. Packing Assembly

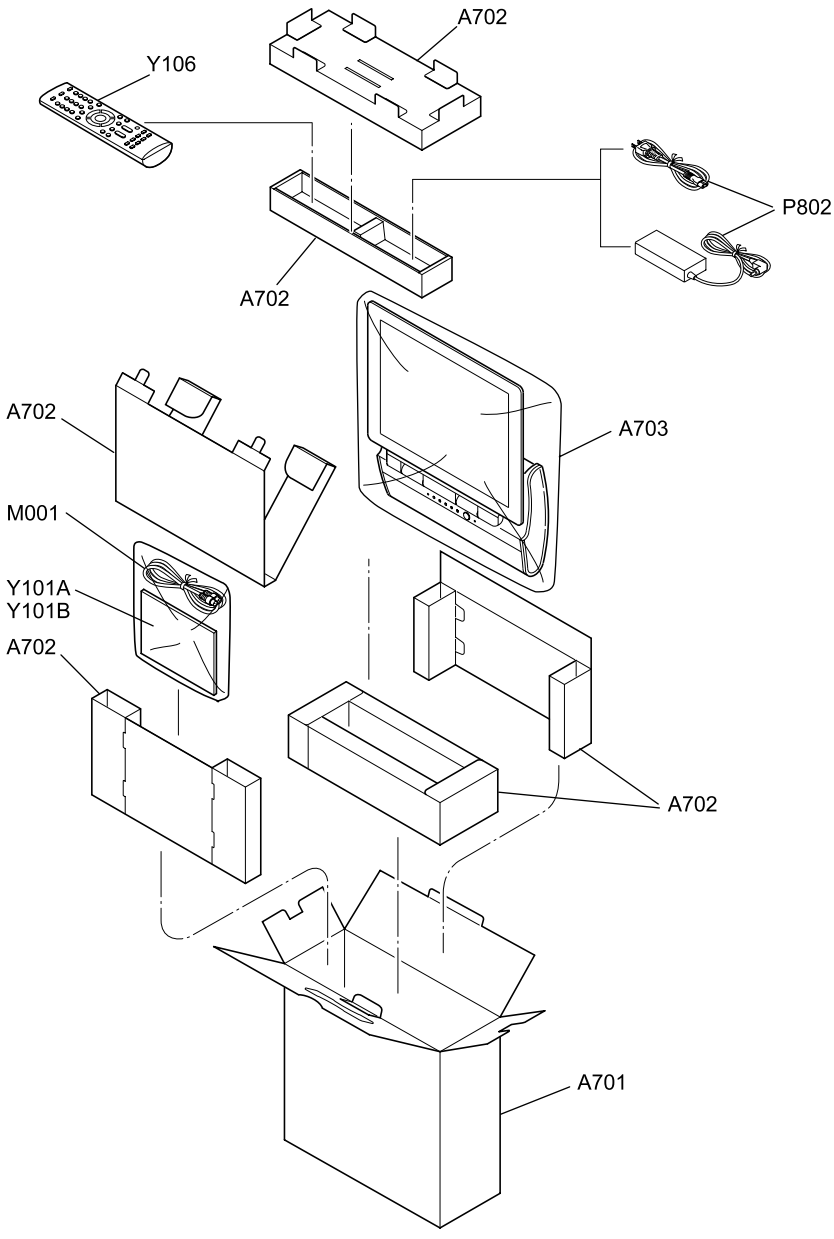

Fig. 3-4-1

4-2. Chassis Assembly

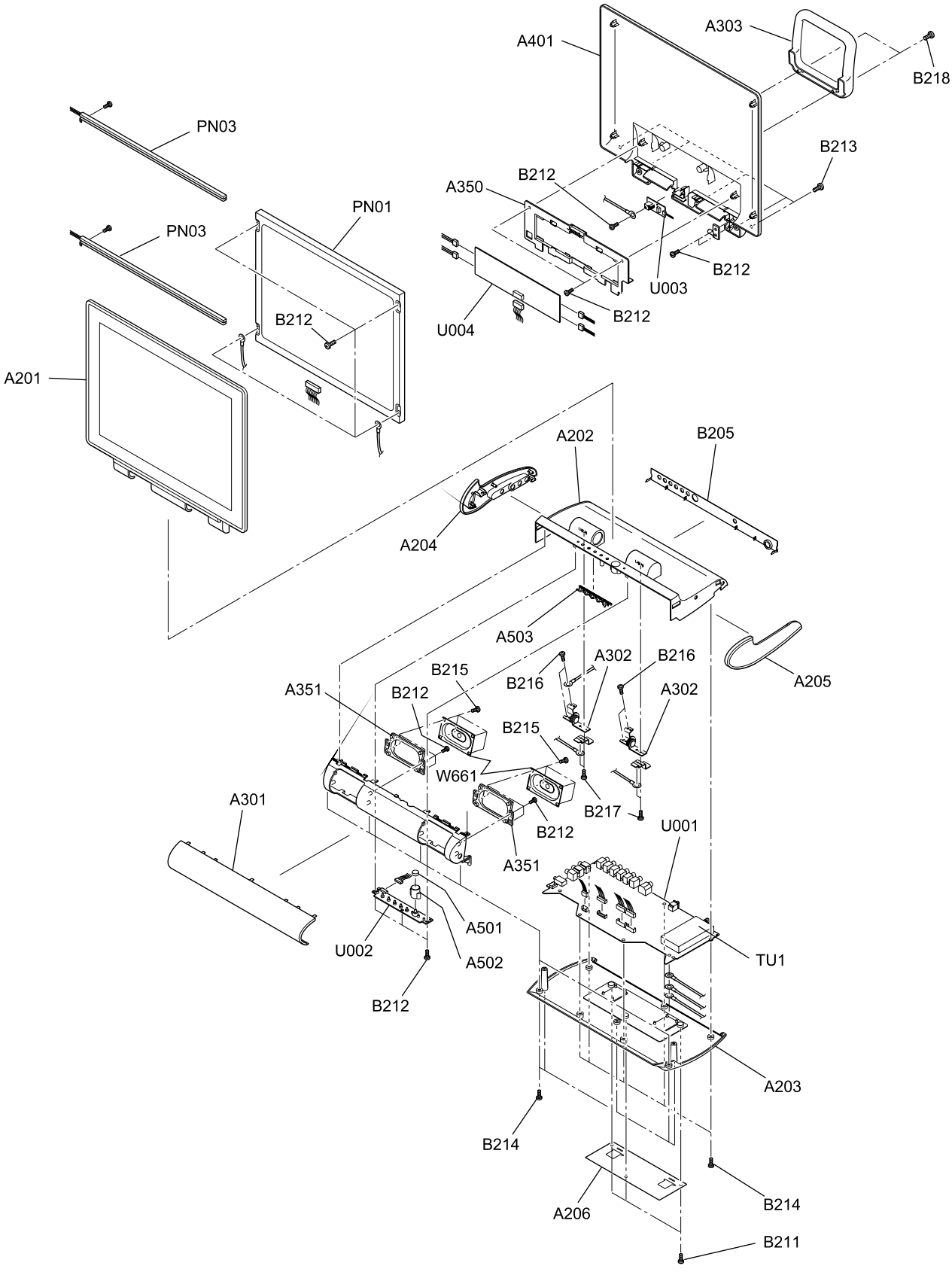

Fig. 3-4-2

5. PARTS LIST

	Location No.	Parts No.	Description
	A201	72790313	FRONT COVER
	A202	72790324	TOP COVER (USA)
	A203	72624045	BOTTOM COVER
	A204	72790321	LEFT SIDE COVER(USA)
	A205	72624049	RIGHT SIDE COVER
	A206	72741033	PLATE
	A301	72621141	FRONT-NET ASSY, A-UA0812
	A302	72643101	HINGE
	A303	72643102	HANDLE
	A350	72790314	HOLDER-INVERTER
	A351	72790315	HOLDER-SPEAKER
	A352	72790320	SHAFT PANEL
	A353	72790327	ANGLE-TILT ,
	A354	72790328	PLATE BUTTON (USA)
	A355	72790331	BAND CORD CLAMP
	A356	72790332	SHAFT-PANEL 320X10
	A357	72790344	CARTON
	A401	72624052	PANEL-BACK COVER
	A501	72623215	BUTTON, POWER
	A502	72623216	BUTTON, POWER COVER
	A701	72790347	CARTON BOX
	A702	72724019	PACKING
	A703	72731044	BAG
	B205	72790317	PLATE-JACK (USA)
	D101	72790269	ZENER DIODE, UDZS4.7B/MM3Z4V7T1
	D102	72790269	ZENER DIODE, UDZS4.7B/MM3Z4V7T1
	D103	72790269	ZENER DIODE, UDZS4.7B/MM3Z4V7T1
	D104	72790269	ZENER DIODE, UDZS4.7B/MM3Z4V7T1
	D105	72790269	ZENER DIODE, UDZS4.7B/MM3Z4V7T1
	D106	72790269	ZENER DIODE, UDZS4.7B/MM3Z4V7T1
	D107	72790269	ZENER DIODE, UDZS4.7B/MM3Z4V7T1
	D108	72790269	ZENER DIODE, UDZS4.7B/MM3Z4V7T1
	D201	72790276	LED RED 3P, SLR-342VC-T32
	D501	72790269	ZENER DIODE, UDZS4.7B/MM3Z4V7T1
	D502	72790269	ZENER DIODE, UDZS4.7B/MM3Z4V7T1
	D601	72790267	ZENER DIODE, UDZS5.1B/MM3Z5V1T1
	D602	72790267	ZENER DIODE, UDZS5.1B/MM3Z5V1T1
	D603	72790267	ZENER DIODE, UDZS5.1B/MM3Z5V1T1
	D604	72790267	ZENER DIODE, UDZS5.1B/MM3Z5V1T1
	D605	72790267	ZENER DIODE, UDZS5.1B/MM3Z5V1T1
	D606	72790267	ZENER DIODE, UDZS5.1B/MM3Z5V1T1
	D607	72790267	ZENER DIODE, UDZS5.1B/MM3Z5V1T1
	D608	72790267	ZENER DIODE, UDZS5.1B/MM3Z5V1T1
	D681	72790268	ZENER DIODE, UDZS8.2B/MM3Z8V2T1
	D701	72790267	ZENER DIODE, UDZS5.1B/MM3Z5V1T1
	D801	72790271	CHIP DIODE, EC10DS1-TERL
	D802	72790270	RECTIFIER DIODE, MBRS340
	DC1	72790277	LED GREEN/RED 3P, 2.54PIT
	DM1	72790267	ZENER DIODE, UDZS5.1B/MM3Z5V1T1
!	F801	72790278	FUSE, A TSC 5A,R251 010
	IC101	72790237	IC-VIDEO,DECODER , VPC3230D
	IC201	72790238	IC-SCALER , MX88L284AEC
	IC251	72790239	IC-SDRAM , HY57V161610DTC-8
	IC252	72790239	IC-SDRAM , HY57V161610DTC-8
	IC301	72790240	IC-LVDS , DS90C385MTD
	IC302	72790241	IC-FET,SW , FDS4435
	IC501	72790242	IC-VIDEO,SW , NJM2233BV
	IC601	72790243	IC-AUDIO,PROCESS MSP3420G
	IC651	72790244	IC-WOW,PROCESSOR , NJM2700

Location No.	Parts No.	Description
IC681	72790245	IC-AUDIO,AMP , TDA1517
IC701	72790246	IC-MICOM,OTP, S3P863AXZZ-AQBA
IC702	72790247	IC-REGULATOR , MC78L05AD
IC703	72790248	IC-EEPROM , 24C16
IC704	72790249	IC-RESET , KIA7042
IC801	72790241	IC-FET,SW , FDS4435
IC802	72790250	IC-REGULATOR , MC78M08C
IC803	72790251	IC-DC CONVERTOR , LM2596S-5.0 LM2596S-5.0
IC804	72790252	IC-REGULATOR , RC1587M33
ICM1	72790253	REMOCON MODULE , KSM-71 TH5
ICZ1	72790236	IC-CAPTION Z86129
JA501	72790280	JACK SVHS,YKF51-5560
JA502	72790281	JACK-RCA VIDEO, YKC21-5856N
JA503	72790282	JACK-RCA DVD, YKC21-5913N KAI
JA504	72790281	JACK-RCA VIDEO, YKC21-5856N
JA681	72790283	JACK-PHONE STERO, YKB21-5101A
JA801	72790284	JACK-DC POWER, DO-230-110
L101	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L102	72790262	INDUCTOR-SMD , FI-B2012-222KJT
L103	72790262	INDUCTOR-SMD , FI-B2012-222KJT
L104	72790262	INDUCTOR-SMD , FI-B2012-222KJT
L105	72790262	INDUCTOR-SMD , FI-B2012-222KJT
L106	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L107	72790262	INDUCTOR-SMD , FI-B2012-222KJT
L108	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L109	72790262	INDUCTOR-SMD , FI-B2012-222KJT
L110	72790262	INDUCTOR-SMD , FI-B2012-222KJT
L111	72790262	INDUCTOR-SMD , FI-B2012-222KJT
L112	72790262	INDUCTOR-SMD , FI-B2012-222KJT
L113	72790262	INDUCTOR-SMD , FI-B2012-222KJT
L201	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L202	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L203	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L301	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L302	72790264	POWER INDUCTOR-SMD, 47UH/2A4
L303	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L304	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L501	72790258	EMI FILTER , EF-1T2012-330JT
L502	72790258	EMI FILTER , EF-1T2012-330JT
L503	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L504	72790258	EMI FILTER , EF-1T2012-330JT
L505	72790260	FERRITE BEAD, HH-1M3216-121J
L506	72790258	EMI FILTER , EF-1T2012-330JT
L507	72790258	EMI FILTER , EF-1T2012-330JT
L508	72790258	EMI FILTER , EF-1T2012-330JT
L509	72790260	FERRITE BEAD, HH-1M3216-121J
L510	72790258	EMI FILTER , EF-1T2012-330JT
L511	72790258	EMI FILTER , EF-1T2012-330JT
L512	72790258	EMI FILTER , EF-1T2012-330JT
L513	72790258	EMI FILTER , EF-1T2012-330JT
L514	72790260	FERRITE BEAD, HH-1M3216-121J
L515	72790258	EMI FILTER , EF-1T2012-330JT
L516	72790263	POWER INDUCTOR-SMD , 33UH/300MA
L517	72790260	FERRITE BEAD, HH-1M3216-121J
L524	72790260	FERRITE BEAD, HH-1M3216-121J
L530	72790260	FERRITE BEAD, HH-1M3216-121J
L601	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L602	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L603	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L651	72790261	INDUCTOR-SMD , FI-A2012-331KJT
L681	72790260	FERRITE BEAD, HH-1M3216-121J

	Location No.	Parts No.	Description
	L801	72790259	FILTER , ZJR5101-102
	L802	72790260	FERRITE BEAD, HH-1M3216-121J
	L803	72790260	FERRITE BEAD, HH-1M3216-121J
	L804	72790264	POWER INDUCTOR-SMD, 47UH/2A4
	LZ1	72790261	INDUCTOR-SMD , FI-A2012-331KJT
!	P802	72790335	AC ADAPTER USA JP6004
!	P803	72790337	AC CORD (USA)
!	P804	72790340	AC CORD (K)
!	PN01	72515005	LCD , LTM15C458V
	Q101	72790265	TR-NPN TRANSISTOR , BC848
	Q301	72790265	TR-NPN TRANSISTOR , BC848
	Q502	72790266	TR-PNP TRANSISTOR , TR-BC858
	Q681	72790265	TR-NPN TRANSISTOR , BC848
	Q682	72790265	TR-NPN TRANSISTOR , BC848
	Q683	72790265	TR-NPN TRANSISTOR , BC848
	Q701	72790265	TR-NPN TRANSISTOR , BC848
	Q702	72790265	TR-NPN TRANSISTOR , BC848
	Q801	72790265	TR-NPN TRANSISTOR , BC848
	R201	72790272	FERRITE-BEAD, HB-1M2012-221JT
	R202	72790274	NET FERRITE-B, HB-4M3216-301JT
	R203	72790274	NET FERRITE-B, HB-4M3216-301JT
	R204	72790274	NET FERRITE-B, HB-4M3216-301JT
	R205	72790274	NET FERRITE-B, HB-4M3216-301JT
	R206	72790273	FERRITE-BEAD, HB-1M2012-301JT
	R207	72790274	NET FERRITE-B, HB-4M3216-301JT
	R208	72790274	NET FERRITE-B, HB-4M3216-301JT
	R209	72790274	NET FERRITE-B, HB-4M3216-301JT
	R210	72790274	NET FERRITE-B, HB-4M3216-301JT
	R211	72790272	FERRITE-BEAD, HB-1M2012-221JT
	R212	72790272	FERRITE-BEAD, HB-1M2012-221JT
	R219	72790275	NETWORK BEAD
	R220	72790275	NETWORK BEAD
	R221	72790275	NETWORK BEAD
	R222	72790275	NETWORK BEAD
	R223	72790275	NETWORK BEAD
	R224	72790275	NETWORK BEAD
	R225	72790275	NETWORK BEAD
	R226	72790272	FERRITE-BEAD, HB-1M2012-221JT
	R228	72790272	FERRITE-BEAD, HB-1M2012-221JT
	R229	72790272	FERRITE-BEAD, HB-1M2012-221JT
	R230	72790272	FERRITE-BEAD, HB-1M2012-221JT
	R251	72790274	NET FERRITE-B, HB-4M3216-301JT
	R252	72790274	NET FERRITE-B, HB-4M3216-301JT
	R253	72790274	NET FERRITE-B, HB-4M3216-301JT
	R254	72790274	NET FERRITE-B, HB-4M3216-301JT
	R255	72790274	NET FERRITE-B, HB-4M3216-301JT
	R729	72790272	FERRITE-BEAD, HB-1M2012-221JT
	R730	72790272	FERRITE-BEAD, HB-1M2012-221JT
	R731	72790272	FERRITE-BEAD, HB-1M2012-221JT
	SC1	72790285	TACT SWITCH, SKQNAJD010
	SC2	72790285	TACT SWITCH, SKQNAJD010
	SC3	72790285	TACT SWITCH, SKQNAJD010
	SC4	72790285	TACT SWITCH, SKQNAJD010
	SC5	72790285	TACT SWITCH, SKQNAJD010
	SC6	72790286	POWER SWITCH, SPPH210100
!	TU1	72790288	TV TUNER,TCLN9081DA27D
!	U001	72790310	MAIN PCB ASSY
!	U004	72790330	INVERTER UNIT
	W661	72693032	SPEAKER, S0407J08A
	X101	72790255	X-TAL , 20.25MHZ/12PF/SMD
	X201	72790256	X-TAL , 14.31818MHZ/30PF/SMD

	Location No.	Parts No.	Description
	X601	72790257	X-TAL , 18.432MHZ/15PF/SMD
	X701	72790254	X-TAL , 12MHZ/56PF/SMD
	XX1	72790254	X-TAL , 12MHZ/56PF/SMD
!	Y101A	72790348	OWNER'S MANUAL(A)
!	Y101B	72790349	OWNER'S MANUAL(B)
!	Y106	72790333	REMOCON (USA) CT-842

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