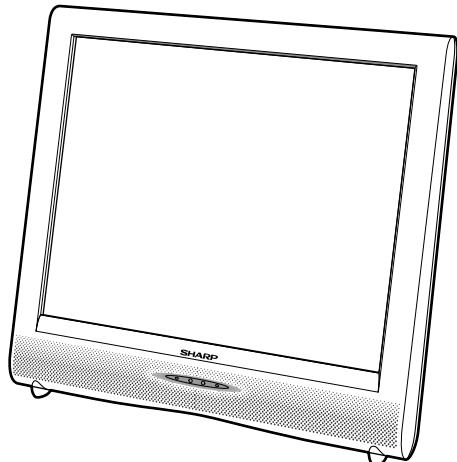


SHARP**SERVICE MANUAL**

S04B1LC20SH1E

**LCD COLOUR TELEVISION****MODEL LC-20SH1E**

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

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IMPORTANT SERVICE SAFETY PRECAUTION

- Service work should be performed only by qualified service technicians who are thoroughly familiar with all safety checks and the servicing guidelines which follow:

WARNING

1. For continued safety, no modification of any circuit should be attempted.
2. Disconnect AC power before servicing.

CAUTION: FOR CONTINUED PROTECTION AGAINST A RISK OF FIRE REPLACE ONLY WITH SAME TYPE F6700 (1.25A, 250V), F6701 (1.25A, 250V), F6702 (1.25A, 250V), F6703 (1.25A, 250V) F6704 (1.25A, 250V) AND F7701 (3.15A, 250V) FUSE.

BEFORE RETURNING THE RECEIVER (Fire & Shock Hazard)

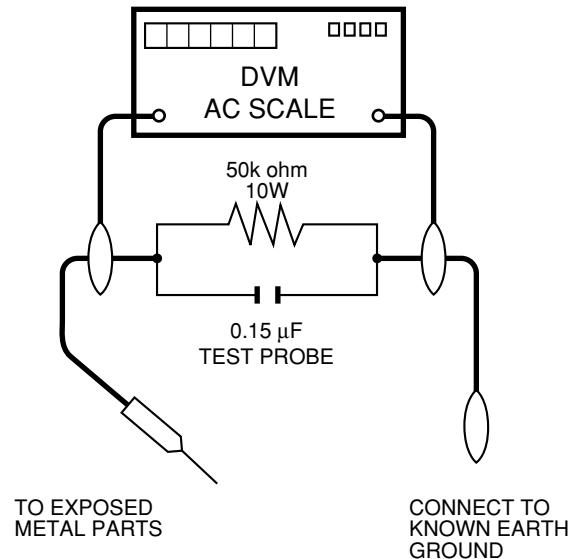
Before returning the receiver to the user, perform the following safety checks:

1. Inspect all lead dress to make certain that leads are not pinched, and check that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulation materials, cabinet backs, adjustment and compartment covers or shields, isolation resistor-capacitor networks, mechanical insulators, etc.
3. To be sure that no shock hazard exists, check for leakage current in the following manner.
- Plug the AC cord directly into a 220~240 volt AC outlet.
- Using two clip leads, connect a 50k ohm, 10 watt resistor paralleled by a 0.15µF capacitor in series with all exposed metal cabinet parts and a known earth ground, such as electrical conduit or electrical ground connected to an earth ground.
- Use an AC voltmeter having with 5000 ohm per volt, or higher, sensitivity or measure the AC voltage drop across the resistor.

- Connect the resistor connection to all exposed metal parts having a return to the chassis (antenna, metal cabinet, screw heads, knobs and control shafts, escutcheon, etc.) and measure the AC voltage drop across the resistor.

All checks must be repeated with the AC cord plug connection reversed. (If necessary, a nonpolarized adaptor plug must be used only for the purpose of completing these checks.)

Any reading of 0.75V peak (this corresponds to 0.5 mA. peak AC.) or more is excessive and indicates a potential shock hazard which must be corrected before returning the monitor to the owner.



SAFETY NOTICE

Many electrical and mechanical parts in LCD television have special safety-related characteristics.

These characteristics are often not evident from visual inspection, nor can protection afforded by them be necessarily increased by using replacement components rated for higher voltage, wattage, etc.

Replacement parts which have these special safety characteristics are identified in this manual; electrical components having such features are identified by "⚠"

and shaded areas in the **Replacement Parts Lists and Schematic Diagrams**.

For continued protection, replacement parts must be identical to those used in the original circuit.

The use of a substitute replacement parts which do not have the same safety characteristics as the factory recommended replacement parts shown in this service manual, may create shock, fire or other hazards.

Precautions for using lead-free solder

1 Employing lead-free solder

"MAIN PWB" of this model employs lead-free solder. The LF symbol indicates lead-free solder, and is attached on the PWBS and service manuals. The alphabetical character following LF shows the type of lead-free solder.

Example:

LFa

Sn-Ag-Cu

Indicates lead-free solder of tin, silver and copper.

2 Using lead-free wire solder

When fixing the PWB soldered with the lead-free solder, apply lead-free wire solder. Repairing with conventional lead wire solder may cause damage or accident due to cracks.

As the melting point of lead-free solder (Sn-Ag-Cu) is higher than the lead wire solder by 40°C, we recommend you to use a dedicated soldering bit, if you are not familiar with how to obtain lead-free wire solder or soldering bit, contact our service station or service branch in your area.

3 Soldering

As the melting point of lead-free solder (Sn-Ag-Cu) is about 220°C which is higher than the conventional lead solder by 40°C, and as it has poor solder wettability, you may be apt to keep the soldering bit in contact with the PWB for extended period of time. However, Since the land may be peeled off or the maximum heat-resistance temperature of parts may be exceeded, remove the bit from the PWB as soon as you confirm the steady soldering condition.

Lead-free solder contains more tin, and the end of the soldering bit may be easily corroded. Make sure to turn on and off the power of the bit as required.

If a different type of solder stays on the tip of the soldering bit, it is alloyed with lead-free solder. Clean the bit after every use of it.

When the tip of the soldering bit is blackened during use, file it with steel wool or fine sandpaper.

Be careful when replacing parts with polarity indication on the PWB silk.

Lead-free wire solder for servicing

Part No.	★	Description	Code
ZHNDAi123250E	J	φ0.3mm 250g(1roll)	BL
ZHNDAi126500E	J	φ0.6mm 500g(1roll)	BK
ZHNDAi12801KE	J	φ1.0mm 1kg(1roll)	BM

Precautions on removing the Sub PWB

• CAUTION

Before taking out and servicing the Sub unit, be sure to discharge the C7703 electrolytic capacitor. Otherwise you may get an electric shock by the capacitor's charging voltage.

SPECIFICATIONS

Items	Model	LC-20SH1E
LCD panel		20" Advanced Super View& BLACK TFT LCD
Number of dots		921,600 dots
Video colour system		PAL/SECAM/NTSC
TV	TV-Standard (CCIR)	B/G, I, D/K, L/L'
	TV-Tuning System	Auto preset 200 ch.
	STEREO/BILINGUAL	NICAM, A2 stereo
	AUTO PRESET	YES
	CATV	~Hyper Band
Brightness		430 cd/m ²
Viewing angles		H: 170° V: 170°
Audio amplifier		2.1 W × 2
Speakers		11 cm × 4 cm 2 pcs.
Terminals	EXT1	21-pin Euro-SCART
	EXT2	S-VIDEO, VIDEO, AUDIO
	OUT	AUDIO
	Antenna	DIN
	Headphones	3.5 mm ø jack (side)
OSD language		English/Spanish/German/French/Italian/Swedish/Dutch/Russian/Portuguese/Turkish/Greek/Finnish/Polish
Power requirement		AC 220 V–240 V, 50/60 Hz
Power consumption		74 W (1.0 W Standby) AC 220 V–240 V
Weight (approx.)		6.3 kg, w/o accessories

■ As a part of policy of continuous improvement, SHARP reserves the right to make design and specification changes for product improvement without prior notice. The performance specification figures indicated are nominal values of production units. There may be some deviations from these values in individual units.

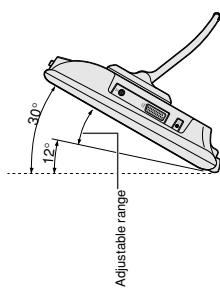
OPERATION MANUAL

Part Names of the Main Unit

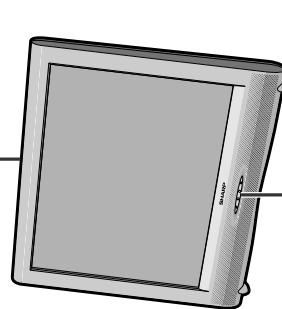
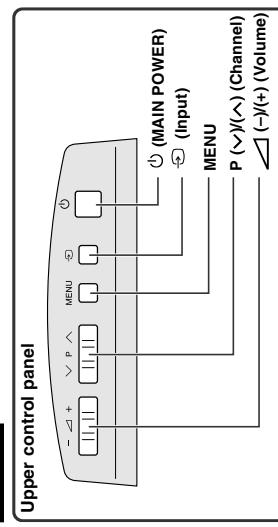
The examples used throughout this manual are based on the LC-20SH1E model.

Controls

■ How to adjust the angle



The screen angle can be tilted backwards between 12 and 30 degrees. (It cannot be set to vertical.) When changing the angle, make sure to hold the stand and adjust the screen to the best viewable angle.



OPC (Optical Picture Control) indicator
The OPC indicator lights up green when the "Backlight" is set to "Auto (OPC)".

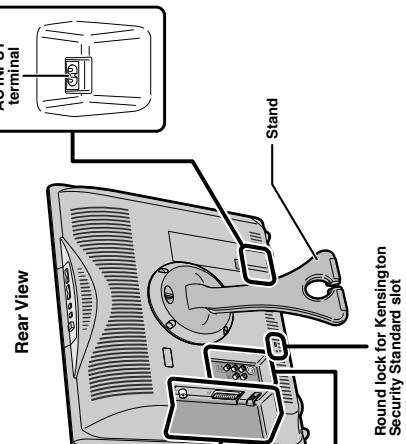
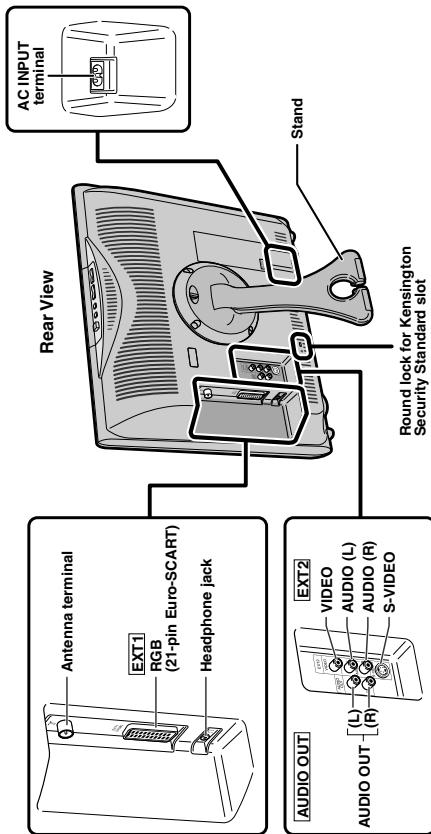
Remote sensor
OPC sensor

STANDBY/ON indicator
The STANDBY/ON indicator lights up green when the power is on, and red when in the standby mode (the indicator will not light when the main power is off).

NOTE

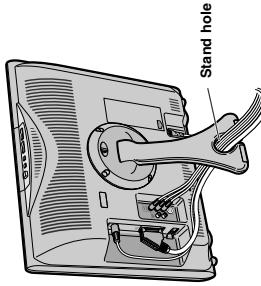
- \ominus (Input), P \swarrow / \nwarrow (Channel), \triangleleft / \triangleright (Volume) and MENU on the control panel of the main unit have the same functions as the same buttons on the remote control. Fundamentally, this operation manual provides a description based on operation using the remote control.

Terminals



How to Fix the Cables

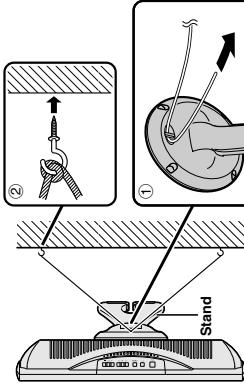
Pull the cables connected to each terminal. Insert the cables into the stand hole and fix the cables.



How to Prevent the LCD TV Set from Falling Over

To prevent the LCD TV set from falling over in case of earthquakes and so on, strap it onto the wall by threading one end of the string through the loop of the stand (①) and fastening the LCD TV set with the string attached to the hook on the wall or the post, etc. (②). (An example of strapping the LCD TV set onto the wall is shown on the right.)

- The string and hook are commercially available.



Part Names of the Remote Control

Preparation

Installing Batteries in the Remote Control

Before using the LCD TV set for the first time, install the two "AA" size batteries (supplied) in the remote control. When the batteries become depleted and the remote control fails to operate, replace the batteries with new "AA" size batteries.

- 1 Open the battery cover.
- 2 Insert two "AA" size batteries.
- 3 Close the battery cover.

Precautions regarding batteries

Improper use of batteries can result in a leakage of chemicals and/or explosion. Be sure to follow the instructions below.

- Place batteries with their terminals corresponding to the (+) and (-) indications.
- Different types of batteries have different characteristics. Do not mix batteries of different types.
- Do not mix old and new batteries. Mixing old and new batteries can shorten the life of new batteries and/or cause old batteries to leak chemicals.
- Remove batteries as soon as they are depleted. Chemicals that leak from batteries can cause a rash. If chemical leakage is found, wipe it off with a cloth.
- The batteries supplied with the LCD TV set may have a shorter operating time due to storage conditions.
- If the remote control is not to be used for an extended period of time, remove the batteries from the remote control.

Using the Remote Control

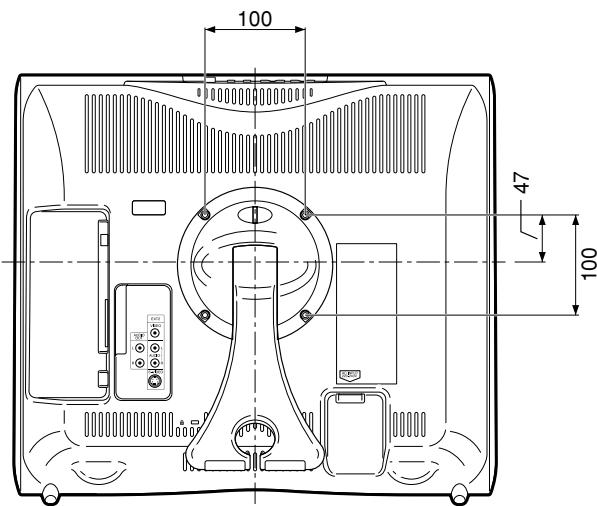
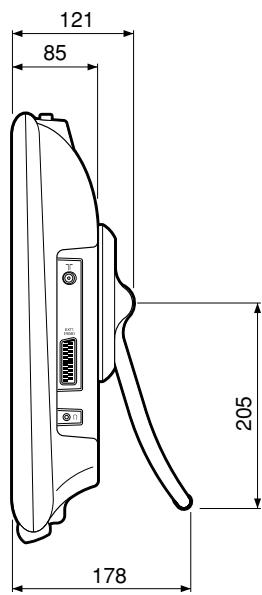
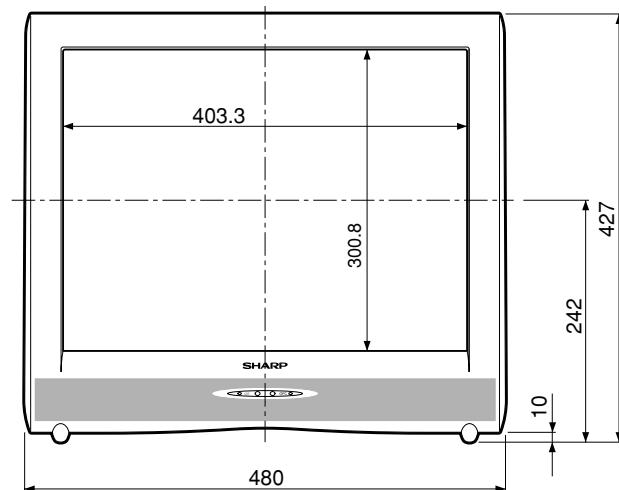
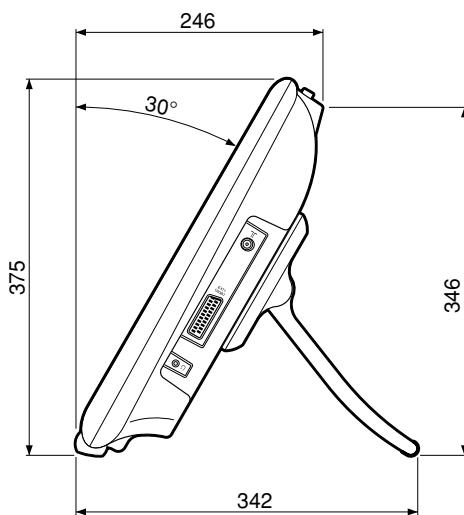
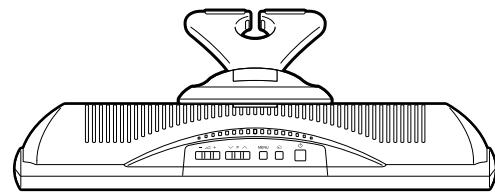
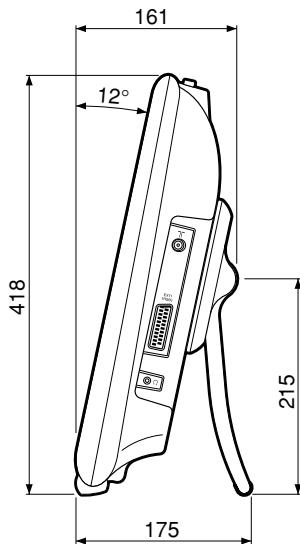
Use the remote control by pointing it towards the remote sensor window of the main unit. Objects between the remote control and sensor window may prevent proper operation.

Cautions regarding use of the remote control

- Do not apply shock to the remote control. In addition, do not expose the remote control to liquids, and do not place it in an area with high humidity.
- Do not install or place the remote control under direct sunlight. The heat may cause deformation of the unit.
- The remote control may not work properly if the remote sensor window is under direct sunlight or strong lighting. In such a case, change the angle of the lighting or main unit, or operate the remote control closer to the remote sensor window.

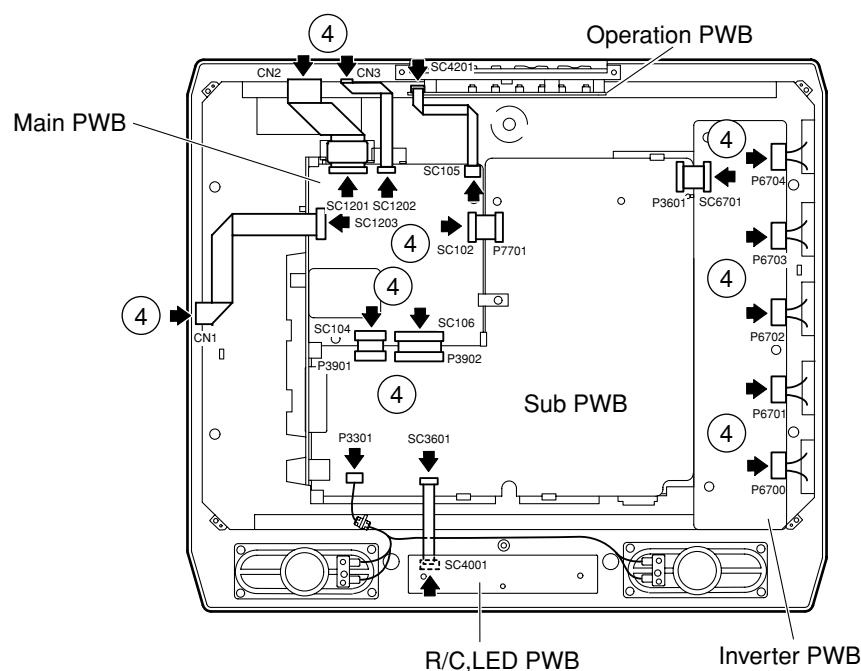
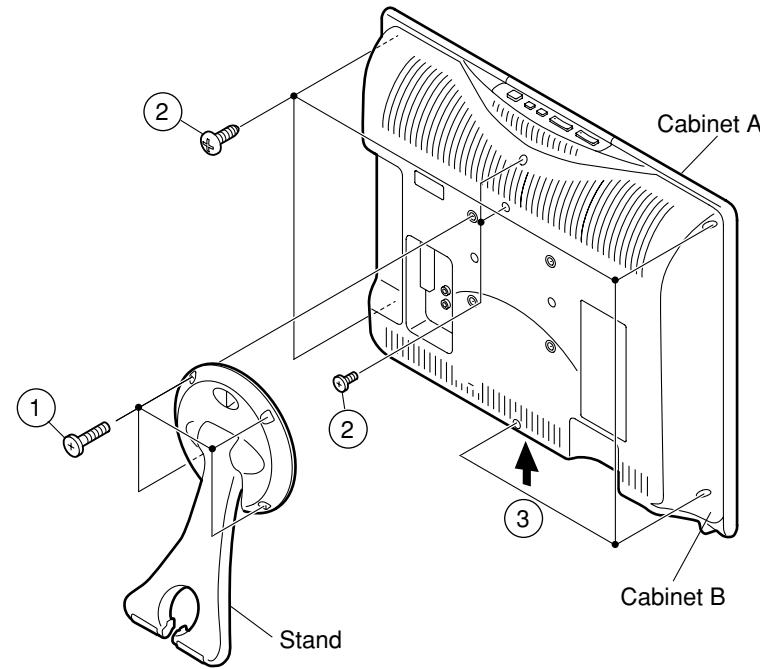
DIMENSIONS

Unit: mm

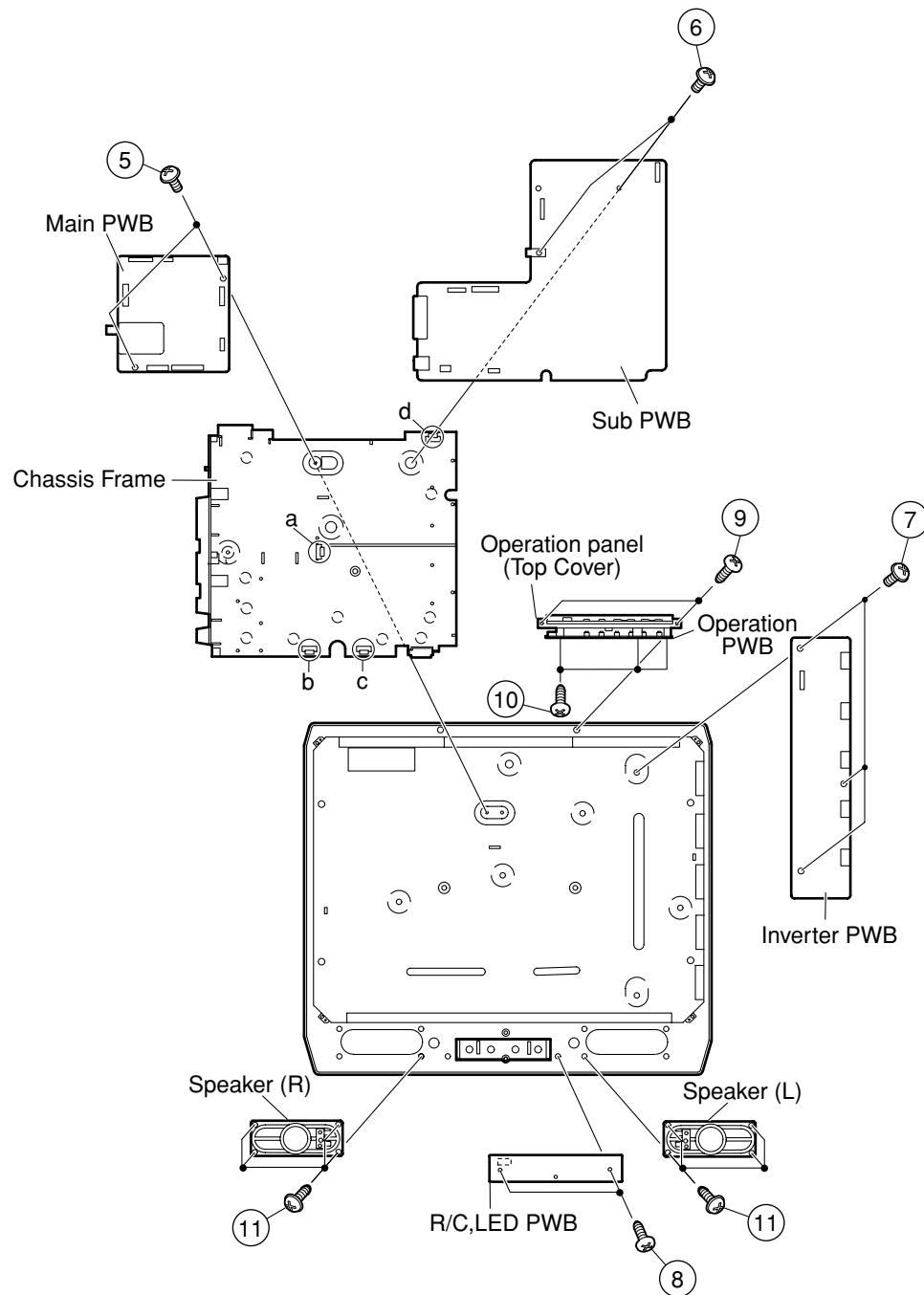


REMOVING OF MAJOR PARTS

1. Remove the stand fixing screws (4 pcs.).
2. Remove the cabinet B fixing screws (7 pcs.).
3. Remove the cabinet B after opening from the direction of an arrow.
4. Detach the connector from each PWB.



5. Remove the 2 lock screws from the main PWB and undo the hooks a. Detach the chassis frame, together with its terminals, from the main PWB.
6. Remove the 2 lock screws from the sub PWB and undo the hooks b, c and d. Detach the chassis frame together with its terminals, from the sub PWB.
7. Remove the 3 lock screws from the inverter PWB and take out the inverter PWB.
8. Remove the 2 lock screws from the R/C, LED PWB and take out the R/C, LED PWB.
9. Remove the 2 lock screws from the operation panel (top cover), and detach the operation panel (top cover).
10. Remove the 3 lock screws from the operation PWB, and detach the operation PWB.
11. Remove the 4 lock screws each from the right and left speakers and take out both the speakers.



- Precautions in handling the LCD panels

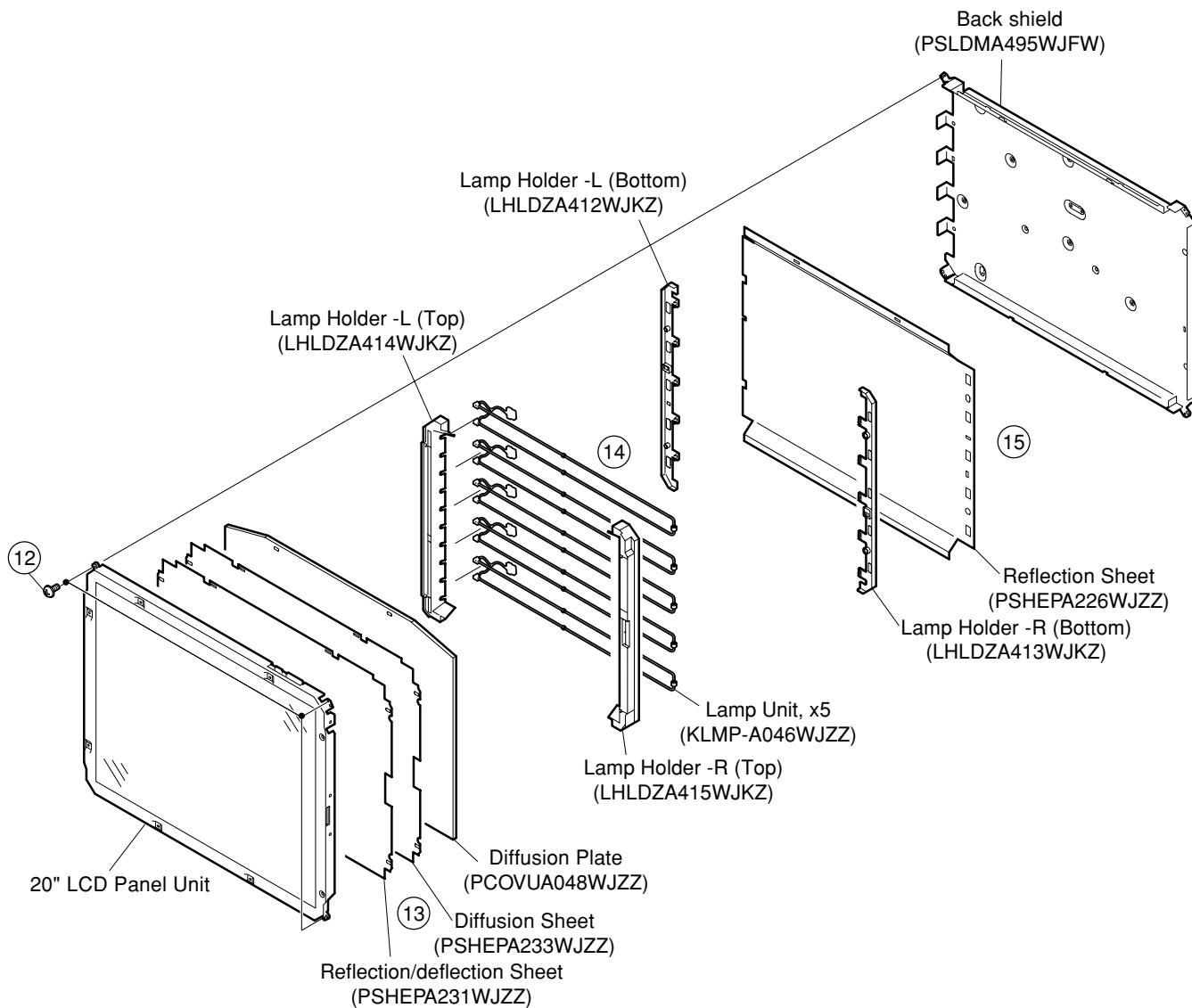
1. Work in a clean room (with humidities below 50%).
2. Be sure to wear an anti-static armband.
3. Handle the panels on an electro-conductive mat.
4. Be careful not to fall, shake and shock the panels.

12. Remove the 3 lock screws from the LCD panel and detach the LCD panel.

13. Remove the reflection/deflection sheet, diffusion sheet and diffusion plate.

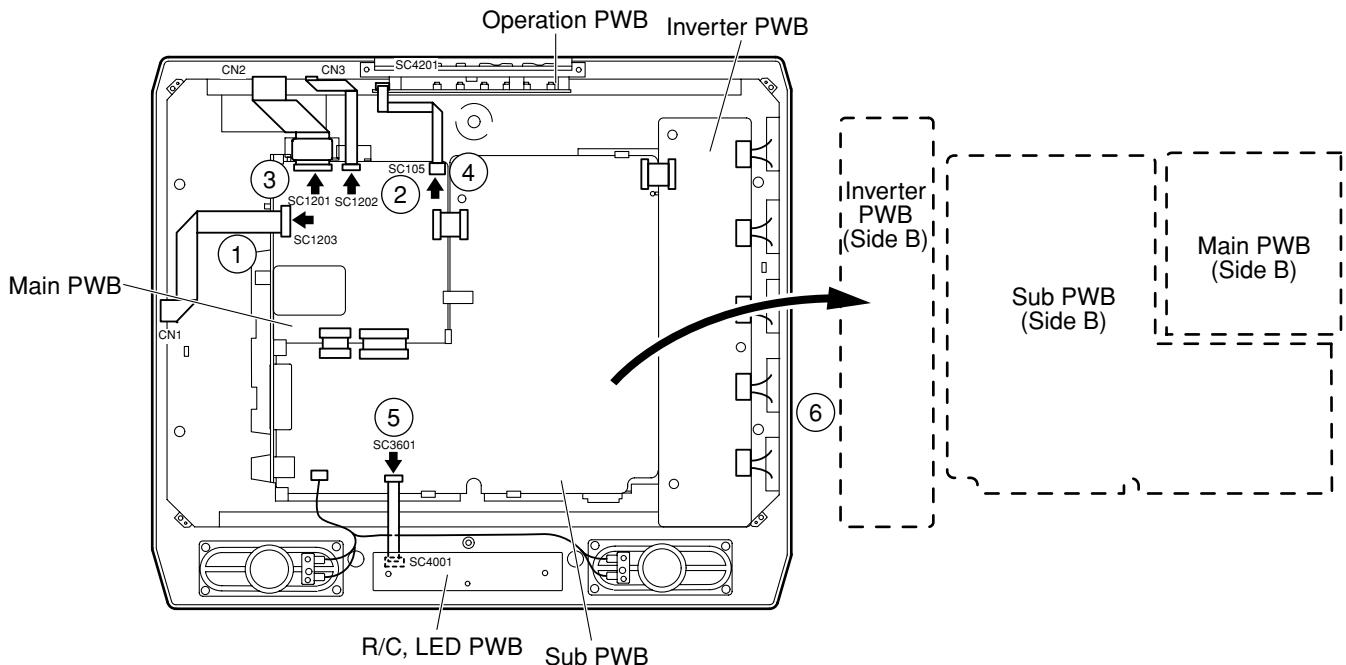
14. Detach the lamp holders -R (top), -L (top) and -R (bottom), -L (bottom) from the lamp unit.

15. Detach the reflection sheet from the back shield.



● Precautions at the time of the side B(back) service of main, sub and Inverter unit.

1. Remove only SC1203 of the FFC for connection between Main unit (SC1203) and LCD panel, and connect the extended cable (QCNW-A553WJZZ) for service.
2. Remove only SC1202 of the FFC for connection between Main unit (SC1202) and LCD panel, and connect the extended cable (QCNW-B556WJZZ) for service.
3. Remove only SC1201 of the FFC for connection between Main unit (SC1201) and LCD panel, and connect the extended cable (QCNW-A555WJZZ) for service.
4. Remove only SC105 of the FFC for connection between Main unit (SC105) and Operation unit (SC4201), and connect the extended cable (QCNW-D444WJQZ) for service.
5. Remove only SC3601 of the FFC for connection between Sub unit (SC3601) and R/C, LED unit (SC4001), and connect the extended cable (QCNW-D445WJQZ) for service.
6. Remove the PWB unit fixing screws (main unit : 2pcs, sub unit : 2pcs., inverter unit : 3pcs.)



Step	Part No.	Description
1	QCNW-A553WJZZ	Extension Cable 30-pin Main (SC1203)-LCD Panel
2	QCNW-B556WJZZ	Extension Cable 50-pin Main (SC1202)-LCD panel
3	QCNW-A555WJZZ	Extension Cable 20-pin Main (SC1201)-LCD panel
4	QCNW-D444WJQZ	Extension Cable 5-pin Operation (SC4201)-Main (SC105)
5	QCNW-D445WJQZ	Extension Cable 8-pin R/C, LED (SC4001)-Sub (SC3601)

ADJUSTING PROCEDURE OF EACH SECTION

The best adjustment is made before shipping. If any position deviation is found or after part replacement is performed, adjust as follows.

Preparation for adjustments

Use a stable AC power source.

LC-20SH1E AC Power : 230V

1. Adjusting procedure

Complete Set → Power ON → Enter Adjustment Process Mode (By Remote Control) → RF AGC adjustment → DCXO adjustment → Common Bias adjustment → White Balance adjustment

2. Entering the adjustment process mode

- After power on, press the adjustment process mode key on the service remote control.
- Switching on the TV set, holding pushed the "Input" and "Volume (-)" Key at once, the TV set enters in the "K" mode.
In this condition, pushing "Volume (-)" and "P (↙)" Key, the adjust mode appears.

3. Key operation in the adjustment process mode

- Use the "UP" or "DOWN" cursor key to select the adjustment mode item.
- Use the "LEFT" or "RIGHT" cursor key to change the data.

4. Initialization

When the EEPROM (IC101) has been replaced or when the EEPROM has been initialized, readjust the each adjust the each adjustments.

4-1. When the EEPROM has been replaced:

- 1) Plug in the AC cord to an AC power outlet and turn on the power.
- 2) When the setting is finished, the LED turns from red to green. In about 15 seconds, the initialization is completed.

4-2. When initializing the EEPROM data and making readjustments:

- 1) Enter the Adjustment Process mode.
- 2) Select the INIT TV item and press the "RIGHT" cursor key to enable the item.
- 3) Unplug the power cable and plug it again in the AC power outlet. Turn on the power.
- 4) When the setting is finished, the LED turns from red to green. In about 5 seconds, the initialization is completed.

<Note>

When the INIT TV item has been enabled in the adjustment process, be sure to unplug the power cable and plug it in again. Then start adjustments. Otherwise the readjusted data cannot be put in memory.

4-3. Setting the screen size (inches)

- 1) Enter the Adjustment Process mode.
- 2) Check the model number.
- 3) Hold down the "LEFT" or "RIGHT" cursor key longer than 2 seconds, and select a screen size (LC-20SH1E).

SH1E	Main Ver	*.*
	Scaler Ver	*.*.*
INCH SIZE		20

5. Adjustment

5-1. RF AGC adjustment

- 1) Feed the colour bar signal.
- 2) In Adjustment Mode, select the RF AGC AUTO ("OFF") and press the "RIGHT" cursor key to start the adjustment.
- 3) Automatic adjustment is complete when it display "OK" is displayed.
- 4) RF AGC data will be in the range of 0-63. If "NOK" is displayed, adjustment failed.

SH1E	Main Ver	***	
	Scaler Ver	***	
RF AGC AUTO	OK		RF AGC Auto adjustment complete
	38		RF AGC data (Example)

5-2. DCXO adjustment

- 1) Feed the colour bar signal.
- 2) In Adjustment Mode, select the DCXO AUTO ("OFF") and press "RIGHT" cursor key to start the adjustment.
- 3) Automatic adjustment is complete when "OK" is displayed. If "NOK" is displayed, adjustment failed.

SH1E	Main Ver	***	
	Scaler Ver	***	
DCXO AUTO	OK		DCXO Auto adjustment complete
	**		DCXO data

5-3. Common bias adjustment

- 1) Select the EXT-Video input and without signal.
- 2) In Adjustment Mode, select the COM BIAS and vary the data until the contrast becomes the sharpest.
(Black looks most sinking.)

5-4. White balance adjustment

[A] White balance pre-adjustment

- 1) Feed the 100% white signal.
- 2) In Adjustment Mode, select the AWBSD ("OFF") and press the "RIGHT" cursor key to start the adjustment.
- 3) Automatic adjustment is complete when "OK" is displayed.

[B] White balance adjustment

Adjust "R CUTOFF2", "G CUTOFF2", "B CUTOFF2", "WB R GAIN", "WB G GAIN" and "WB B GAIN" in the adjustment processing to obtain the same colour as the standard set.

6. Factory setting

6-1. Make the factory setting using the adjustment remote control.

Model	Key Name	Remote Control Code				OSD Language Setting	
A3IK20SH1E	Shipment Setting 1	1000	0011	1111	110	German	(00001 FEh)
A3IK20SH1K	Shipment Setting 2	1000	0000	1010	110	English	(00002 A8h)
A3IK20SH1R	Shipment Setting 3	1000	0110	1011	110	Russian	(00003 EBh)
A3IK20SH1F	Shipment Setting 4	1000	0100	1011	110	French	(00004 E9h)
A3IK20SH1I	Shipment Setting 6	1000	0000	1011	110	Italian	(00005 E8h)

6-2. Different factory settings.

Model	Language	Country	Color System	Sound System
A3IK20SH1E	German	Germany	PAL	B/G
A3IK20SH1K	English	UK	PAL	I
A3IK20SH1R	Russian	Russia	SECAM	D/K
A3IK20SH1F	French	France	SECAM	L/L'
A3IK20SH1I	Italian	Italy	PAL	B/G

7. Lamp error detection

7-1. Functional description

This LCD colour television has a function (lamp error detection) to be turned OFF automatically for safety when the lamp or lamp circuit is abnormal.

If the lamp or lamp circuit is abnormal, or some other errors happen, and the lamp error detection is executed, the followings occur.

- ① The main unit of television is turned OFF 5 seconds after it is turned ON. (The power LED on the front side of TV turns from green to red.)
- ② If the situation ① happens 5 times sequentially, television can not be turned ON. (The power LED remains red.)

7-2. Countermeasures

7-2-1. Check when turning OFF the lamp error detection

If the power has been turned off 5 times because of lamp error, hold down the unit's "INPUT" and "Volume (-)" key simultaneously and turn on the unit's power switch. The TV set gets back on power in the "K" mode.

In this state, press the unit's "Volume (-)" and "P (↙)" key simultaneously. The Adjustment Process mode shows up.

This enables the operation check to detect errors in the lamp or lamp circuit.

Check whether "ERROR NO RESET" of the adjustment process is 1 or more. If it is 1 or more, it indicates the lamp error detection was executed.

7-2-2. Resetting of the lamp error count

After confirming that the lamp or lamp circuit is normal, reset the lamp error count. Select "ERROR NO RESET" of the adjustment process and set the number to 0 using the "LEFT" or "RIGHT" cursor key.



Afterwards, perform the operation check to confirm that the lamp error detection does not function.

8. Hotel mode

8-1. How to enter the Hotel mode.

- 1) Turn on the power and enter the Adjustment Process mode.
- 2) Using the "UP" or "DOWN" cursor key on the remote controller, select the Hotel mode.
- 3) Using the "RIGHT" cursor key on the remote controller, change the setting from "0" to "1". Now the Hotel mode shows up.

Adjustment Process menu

• <u>Hotel mode = "0"</u>	• <u>Hotel mode = "1"</u>
⋮	⋮
Hotel mode 0	Hotel mode 1
⋮	⋮
EXT CONTROL OFF	Max. volume **
⋮	⋮
	On program ***
⋮	⋮
EXT CONTROL OFF	
⋮	⋮

- 4) Using the "UP" or "DOWN" cursor key on the remote controller, select "Max. volume" and "On program". Make the setting with the "LEFT" or "RIGHT" cursor key.
- 5) Finally quit the Adjustment Process mode and turn off the power. The TV set comes on in the Hotel mode after the next switch-on.

8-2. Hotel mode settings

- 1) Max. volume (0-60)
You can set the maximum volume at your desired level.
- 2) On program (0-199)
You can select a desired channel when switching on the TV set.

8-3. Canceling the Hotel mode

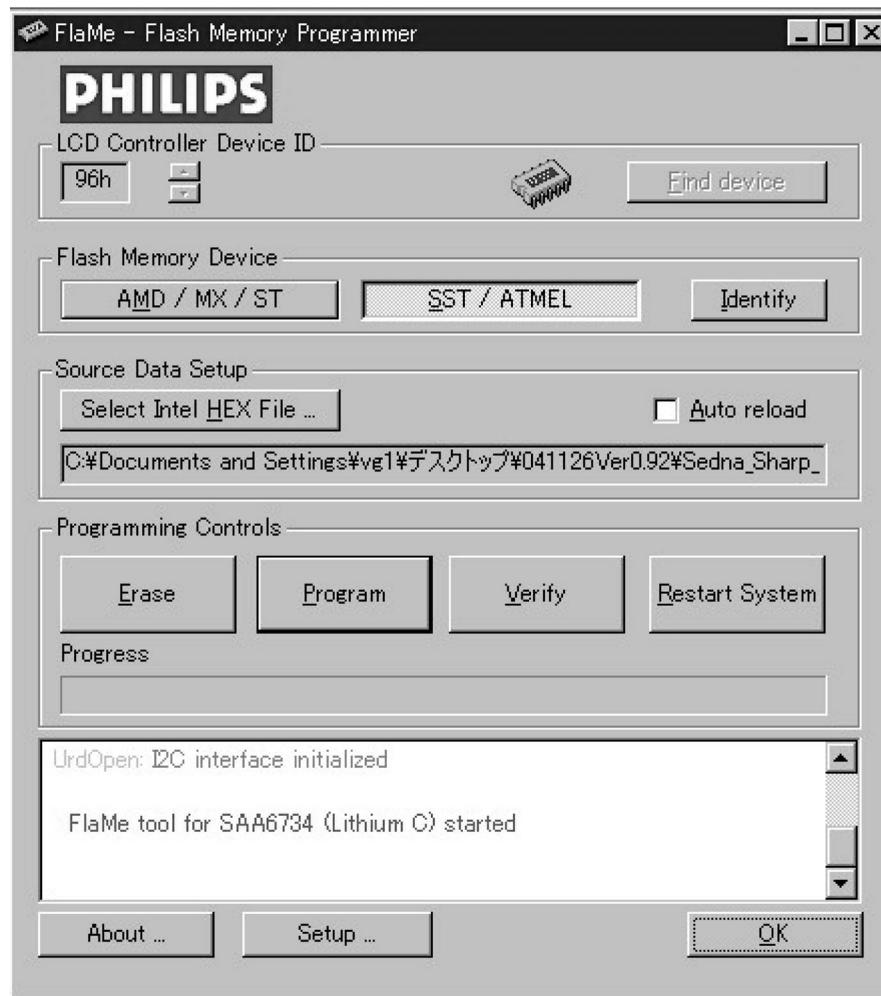
- 1) Turn on the power and enter the Adjustment Process mode.
- 2) Using the "UP" or "DOWN" cursor key, select the Hotel mode.
- 3) Using the "LEFT" cursor key, change the setting from "1" to "0".
- 4) Finally quit the Adjustment Process mode and turn off the power. The TV set comes on out of the Hotel mode after the next switch-on.

9. Software Loading

- 1) Upgrading the software or after replacement of IC151, IC501 or Main PWB, make sure to upload the processors with updated software.
 - 2) Please use the dedicated Interface JIG (JIGINF-001) and supplied programs for upgrading the software.
 - 3) This model employs two software;
 - SCALER microprocessor software
 - MAIN microprocessor software
- Please upload the SCALER microprocessor software first follow by MAIN microprocessor software.

1. SCALER microprocessor

- 1) Set Interface JIG switch to position "SCALER".
- 2) Power ON the set and plug Interface JIG connector to P2002.
- 3) Run the ISP_Tool.exe program.



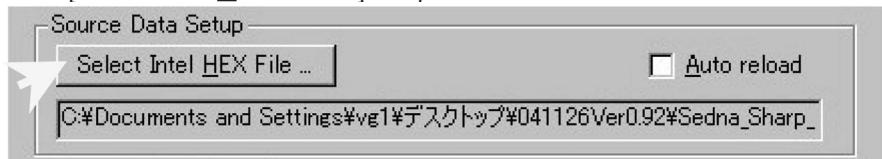
- 4) First click [SST / ATMEL] and then follow by [Identify] to identify the flash memory.



Confirm the item below in Comment Window.



- 5) Click [Select Intel HEX File ...] to open the source files. The source file name are "Sedna_Sharp***.hex"



Confirm the source file is loaded correctly.

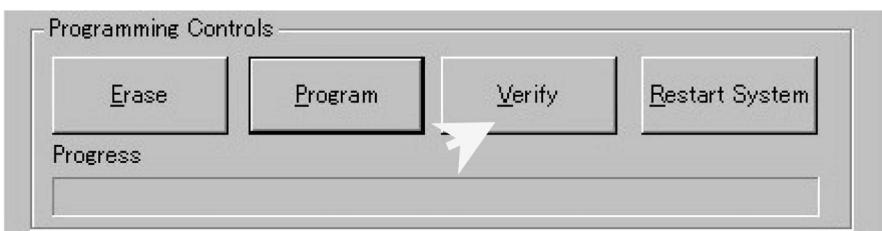
- 6) Next click the [Erase] to erase all the data in the flash memory. Confirm the erase process is complete without any error.



- 7) Then click [Program] to start uploading the source file into the flash memory. After uploading process is complete, confirm there are no error.



- 8) Click [Verify] to verify the uploaded data and confirm there are no error.



9) Finally click [Restart System] to initialize. Confirm "Reset done" in Comment Window.

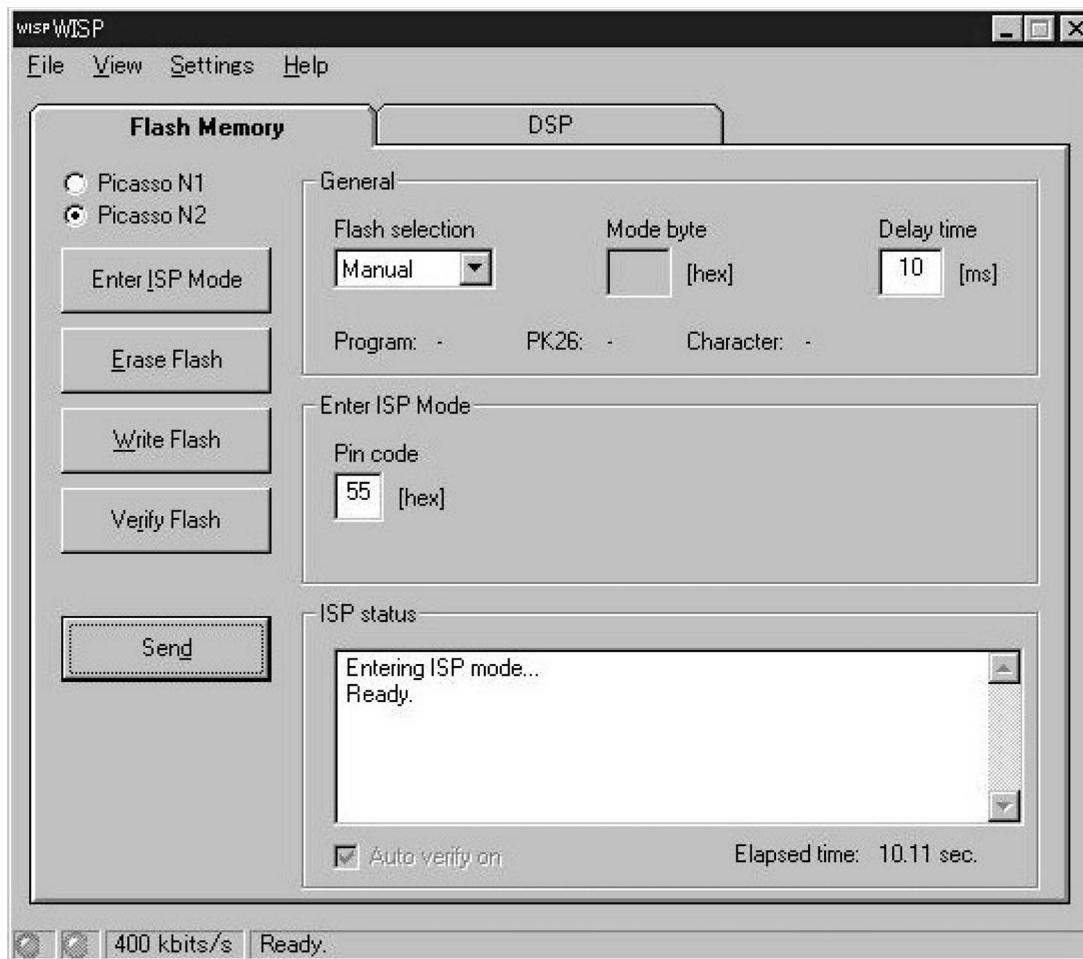


10) Power OFF the set by unplugging AC Cord, remove the JIG from the plug and wait for 1 minute before power ON again.

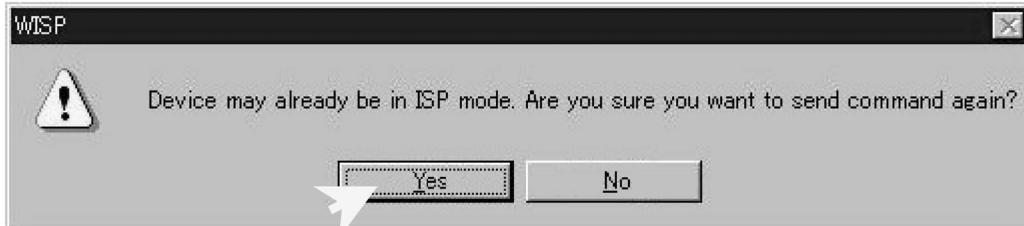
Notes: If any error occur during any process, power OFF the set and repeat the all the process again. If these still fail, please erase Main Software and repeat the whole process again. To erase Main software, please refer to MAIN microprocessor step No. 1) to 5) only.

2. MAIN microprocessor

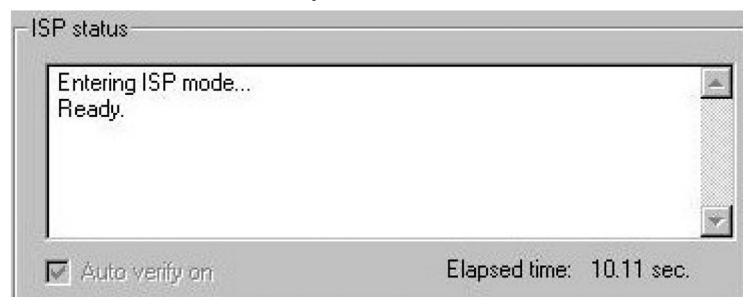
- 1) Set JIG switch to position "LOC".
- 2) Power ON the set and plug Interface JIG connector to P2002.
- 3) Run the WISP.exe program.



- 4) First click [Enter ISP Mode] then click [Send]. If the following window appear, click [Yes]

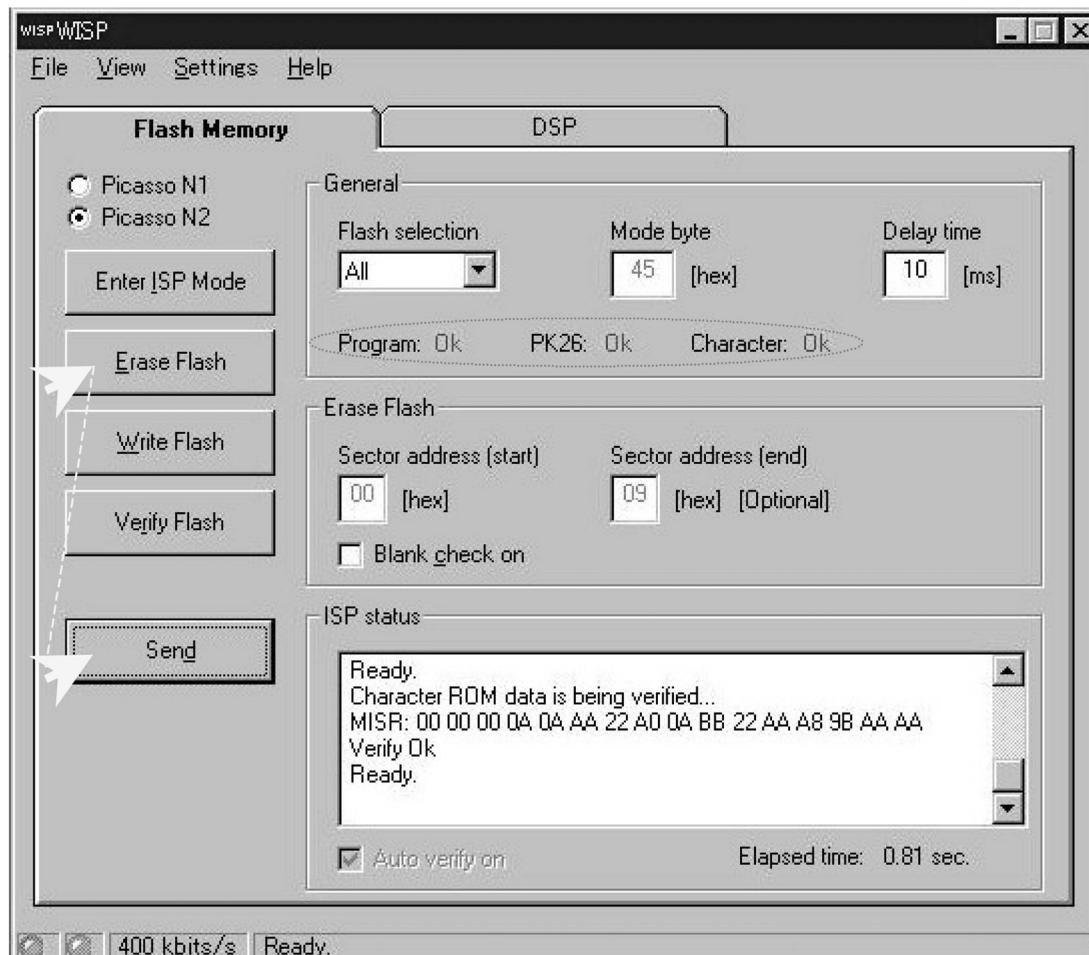


Confirm ISP status "Ready".



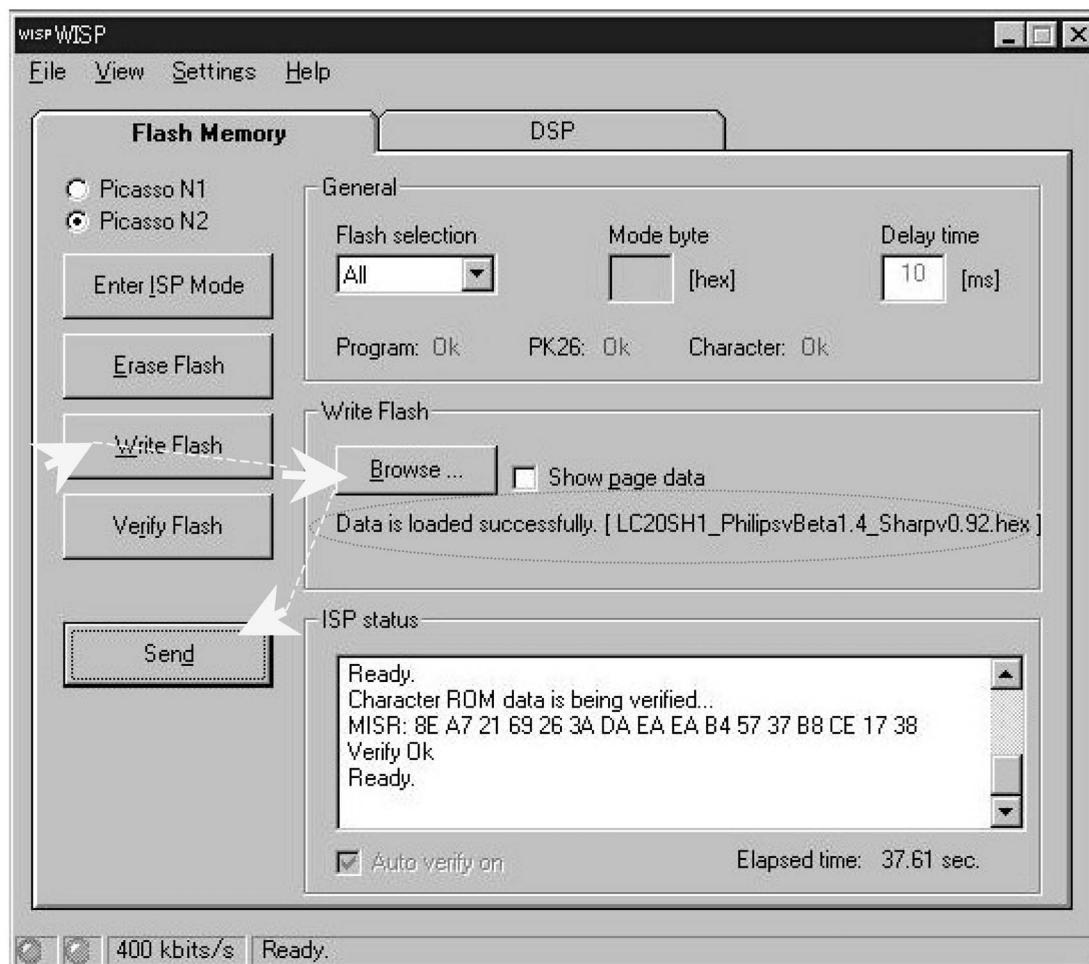
If "Entering ISP is not successful" occur, repeat step No. 4) again. If still fail, unplug the AC cord and repeat from step No. 2) again.

- 5) Then click [Erase Flash], follow by [Send]. Confirm the Program, PK26 & Character are all "OK" and ISP status is "Ready".



If "Failed" occur, unplug the AC cord and repeat the whole process again from beginning.

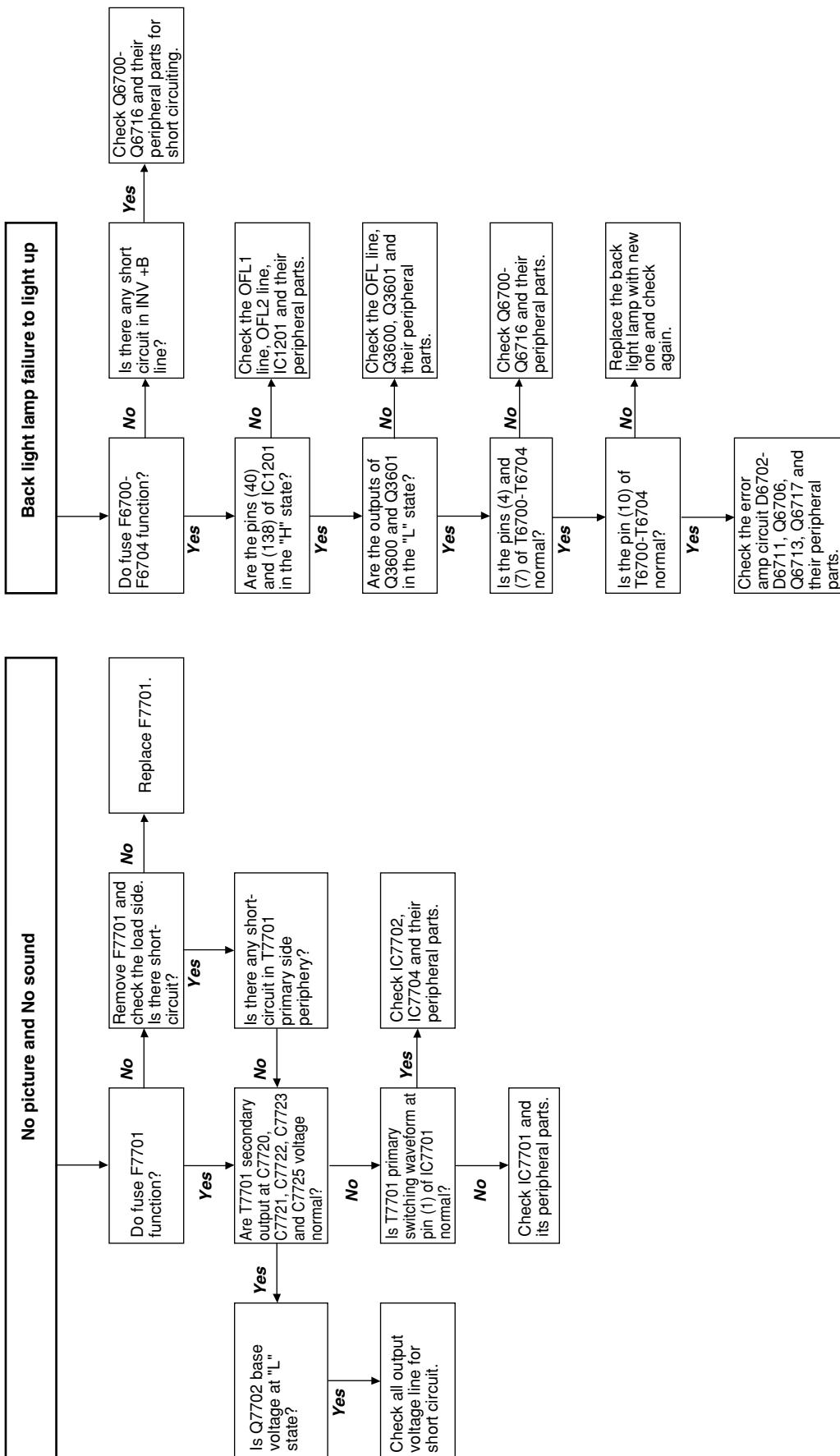
- 6) Next click [Write Flash] and load the source file by clicking [Browse]. The source file name are "LC20SH1_****.hex". Once the data is loaded successfully click [Send]. Confirm the Program, PK26 & Character are all "OK" and ISP status is "Ready".



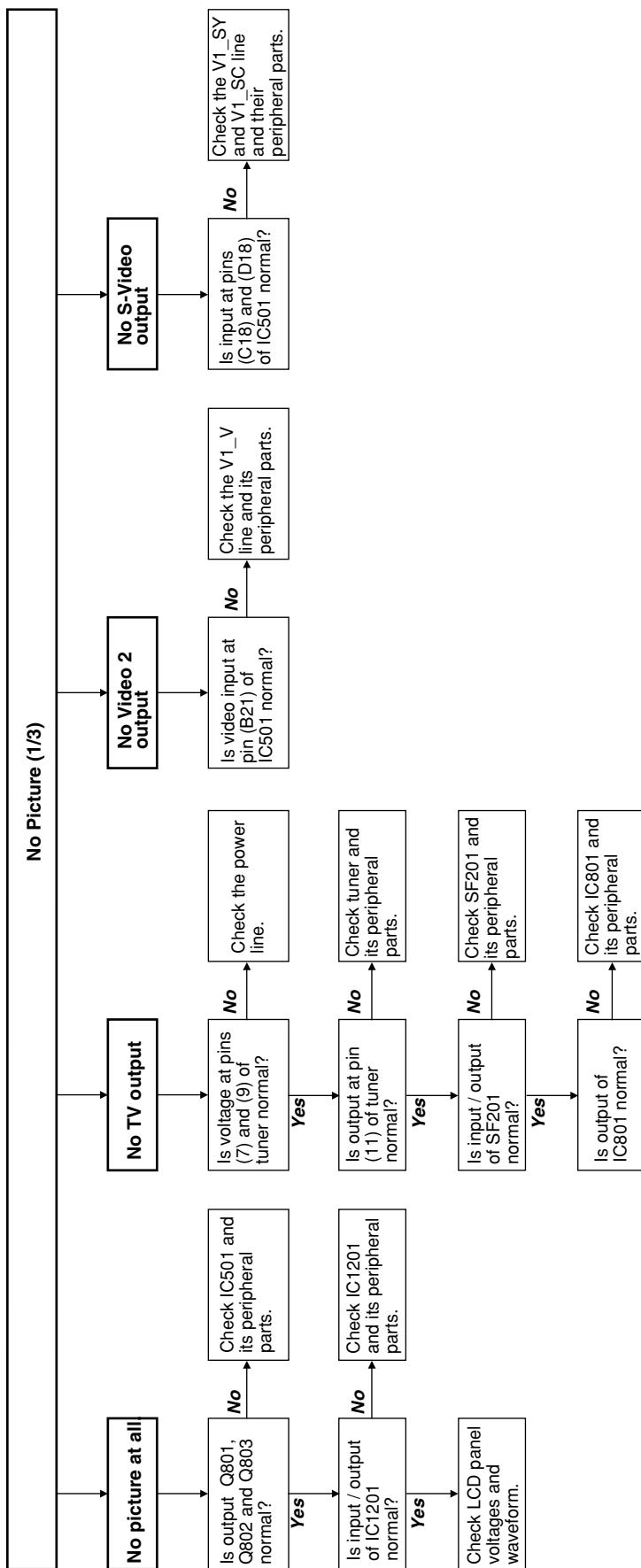
If "Failed" occur, unplug the AC cord and repeat the whole process again from beginning.

- 7) Finally click [Verify Flash] and [Send] to verify the flash memory. Confirm the Program, PK26 & Character are all "OK" and ISP status is "Ready". If "Failed" occur, unplug the AC cord and repeat the whole process again from beginning.
 8) Power OFF the set and remove the JIG.

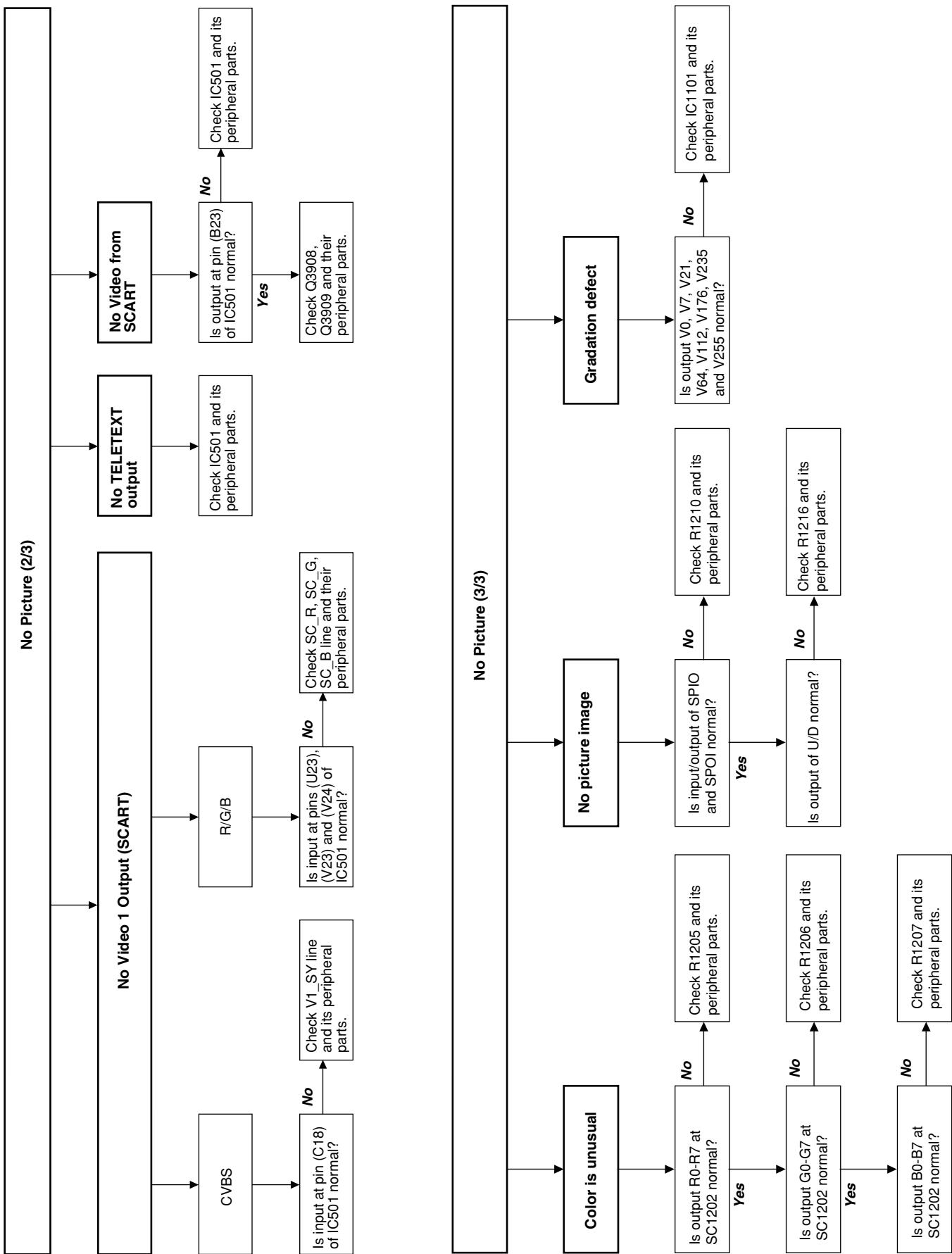
TROUBLE SHOOTING TABLE



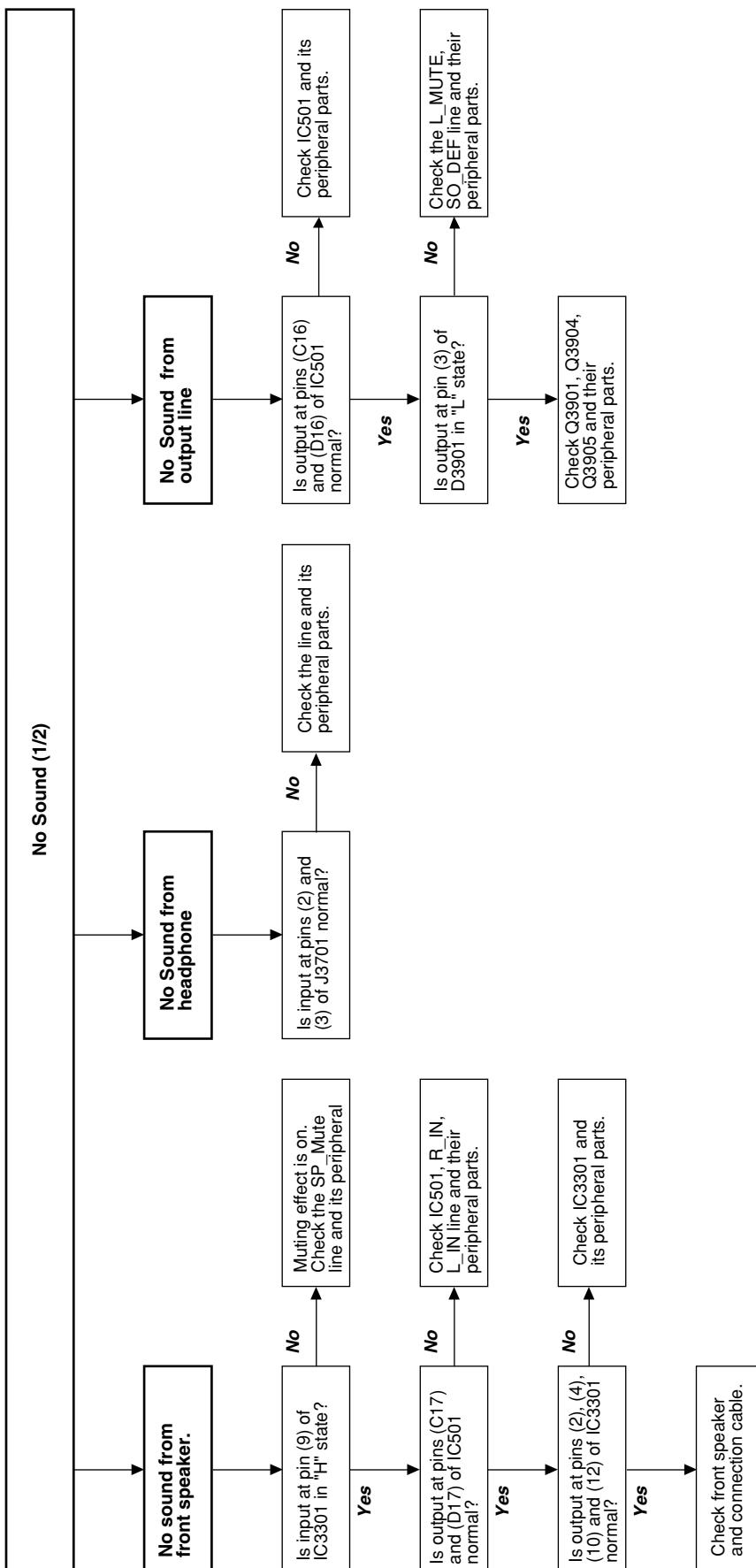
TROUBLE SHOOTING TABLE (Continued)



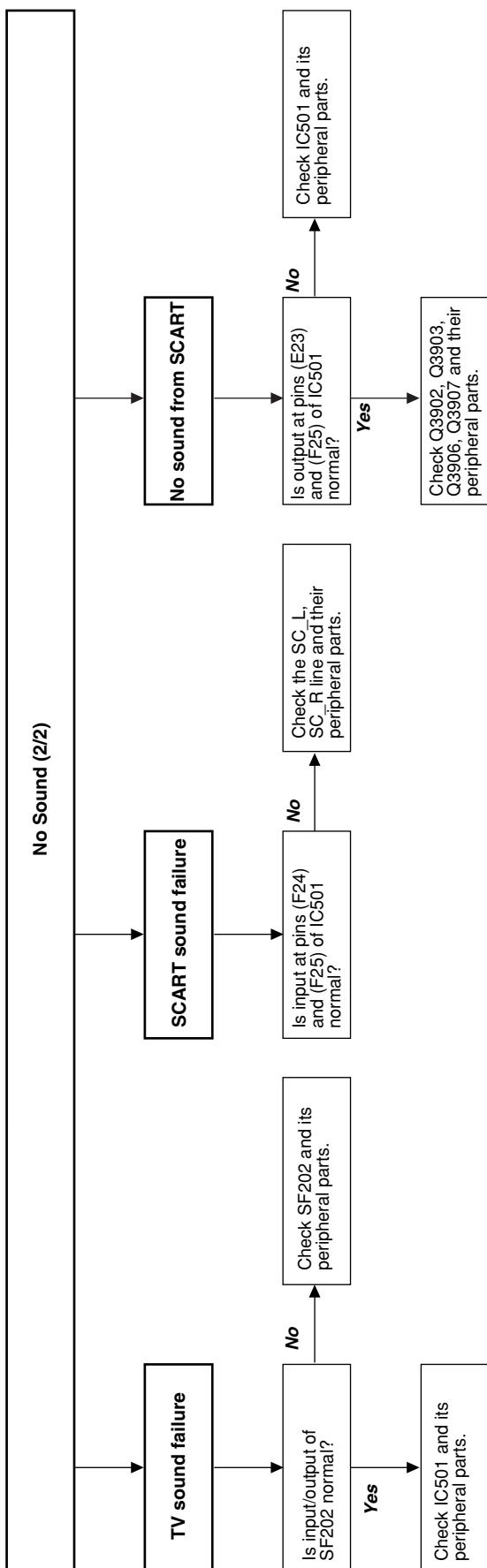
TROUBLE SHOOTING TABLE (Continued)



TROUBLE SHOOTING TABLE (Continued)



TROUBLE SHOOTING TABLE (Continued)



CHASSIS LAYOUT

H

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E

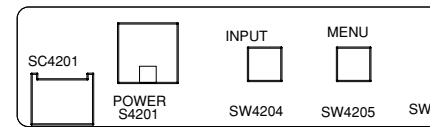
D

C

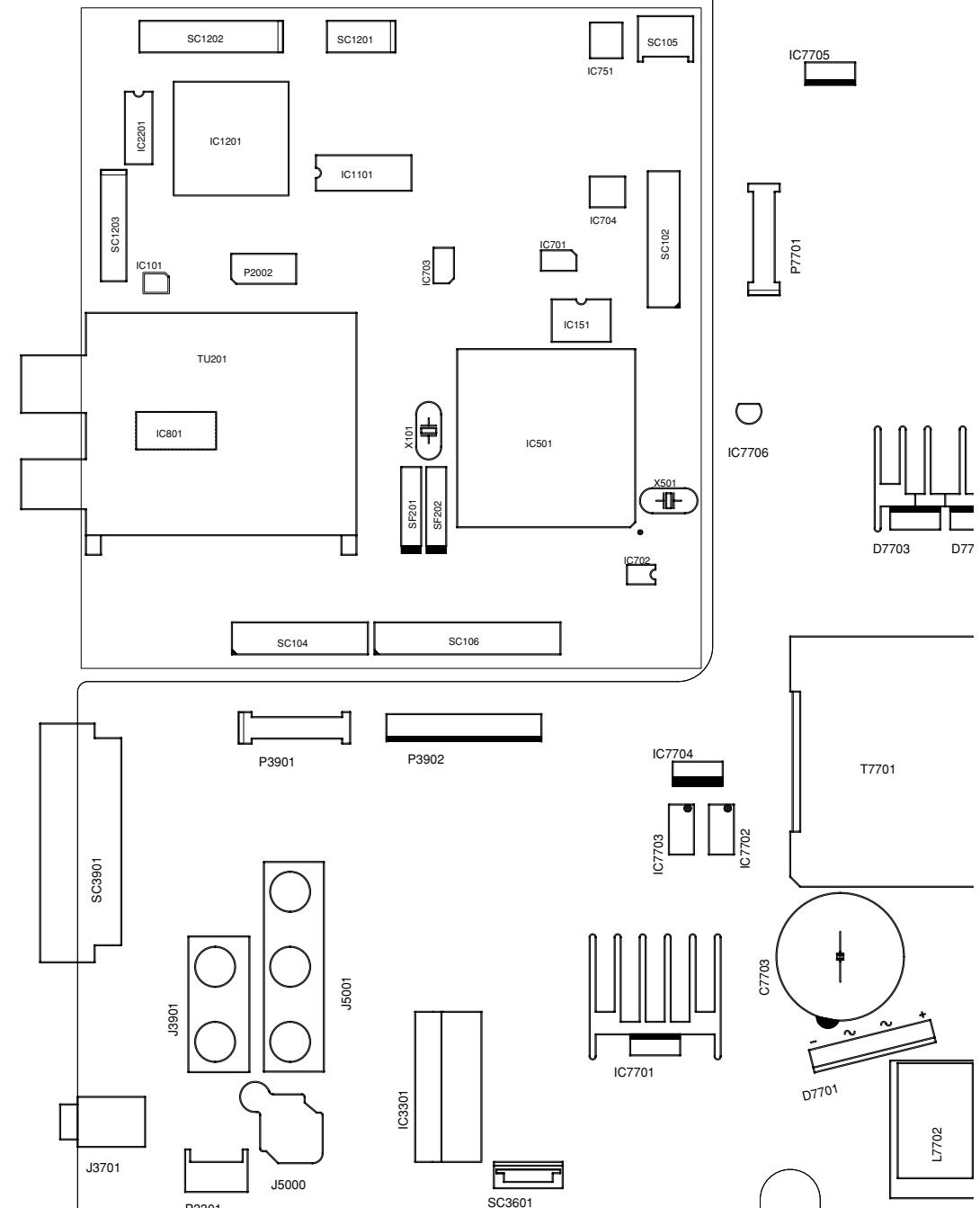
B

A

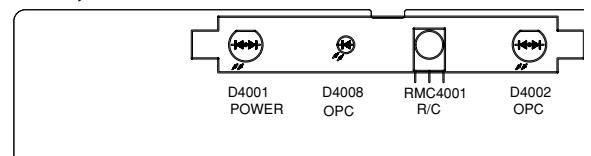
OPERATION Unit



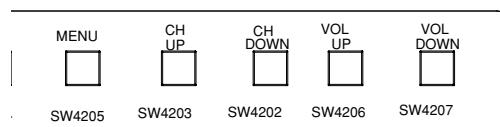
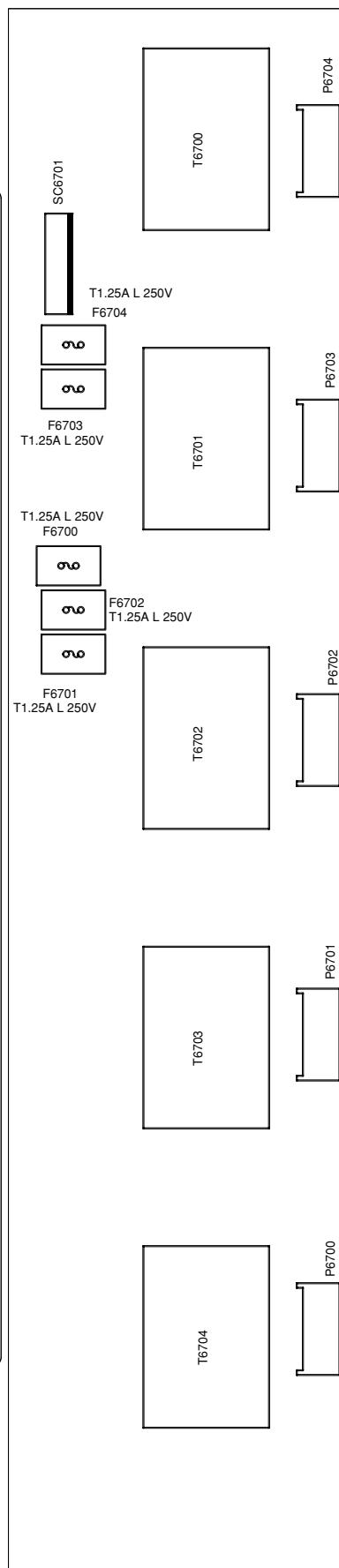
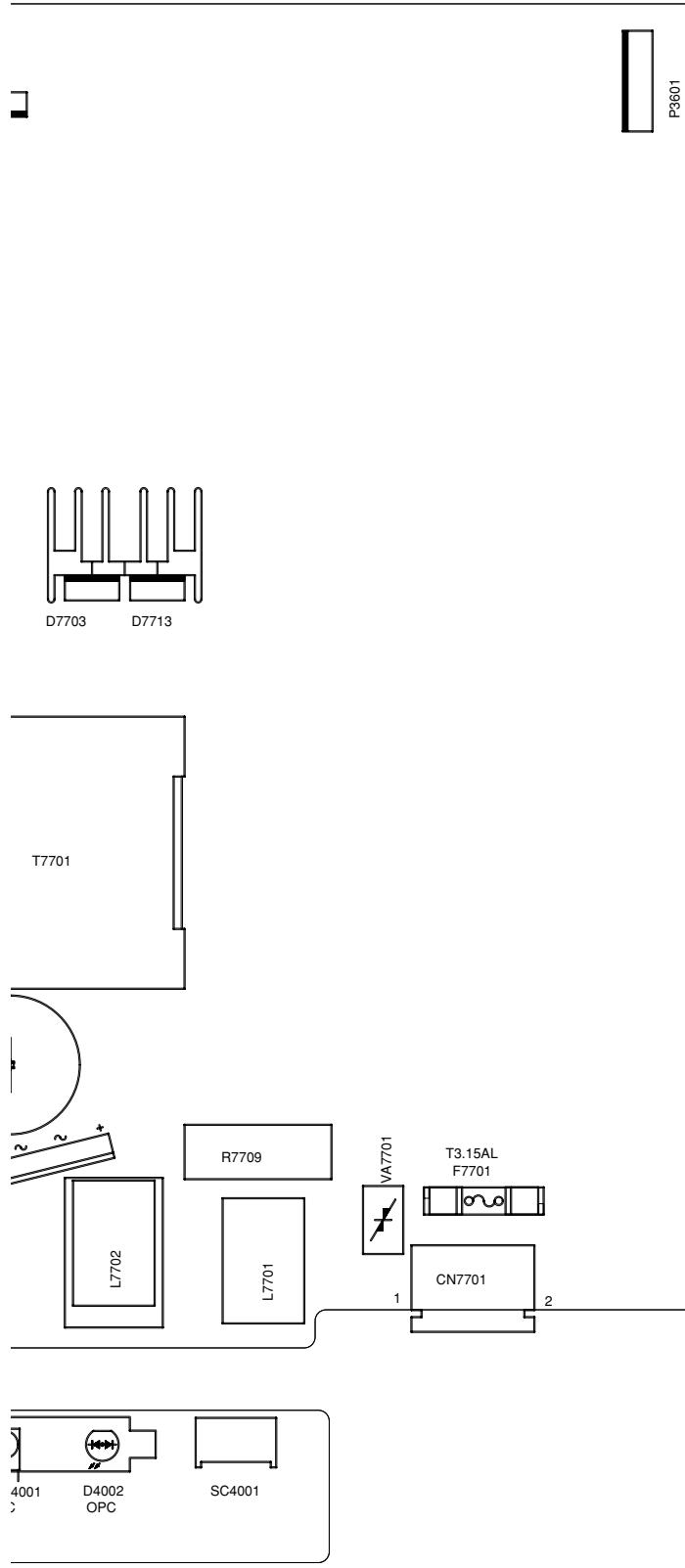
MAIN Unit



R/C, LED Unit

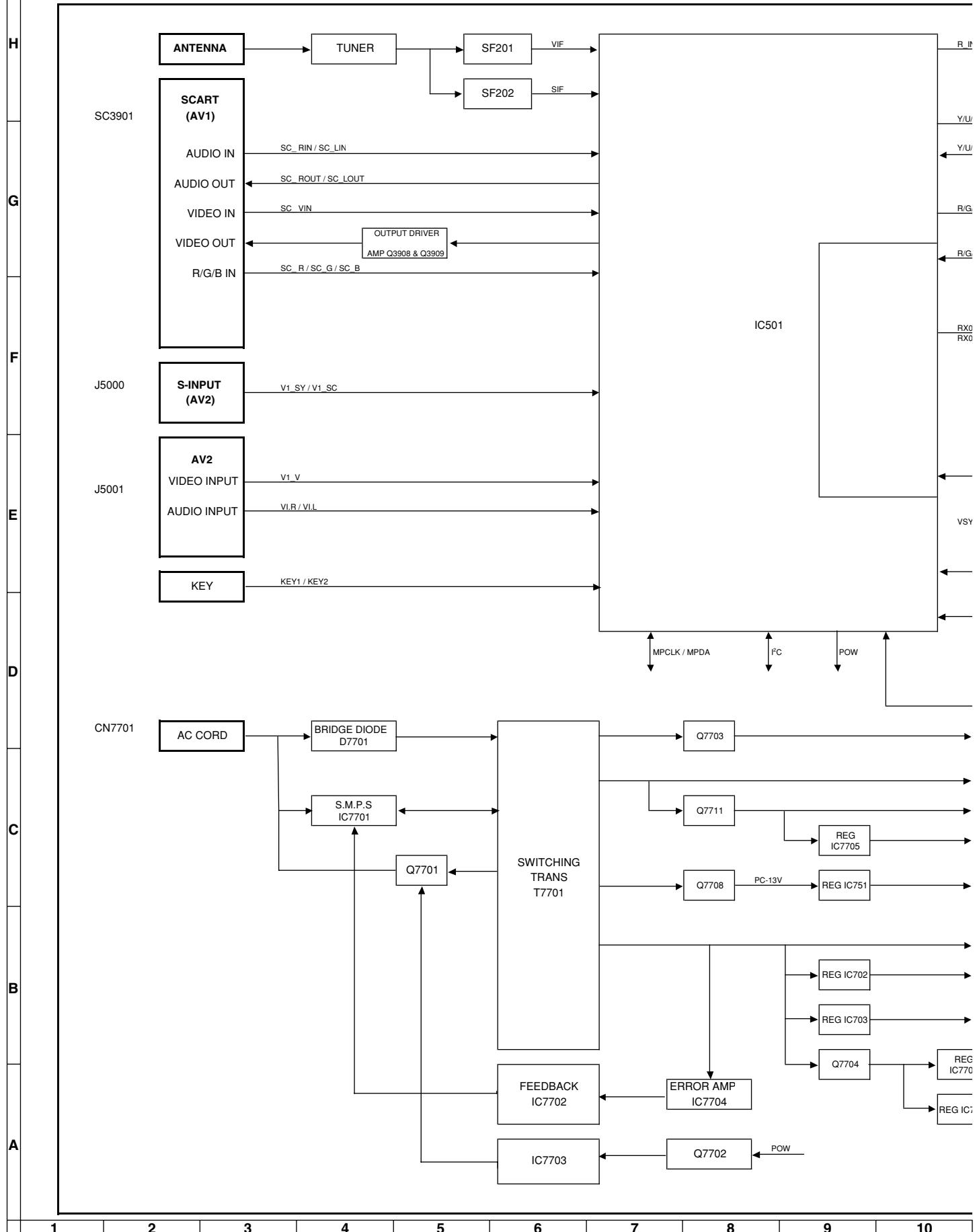


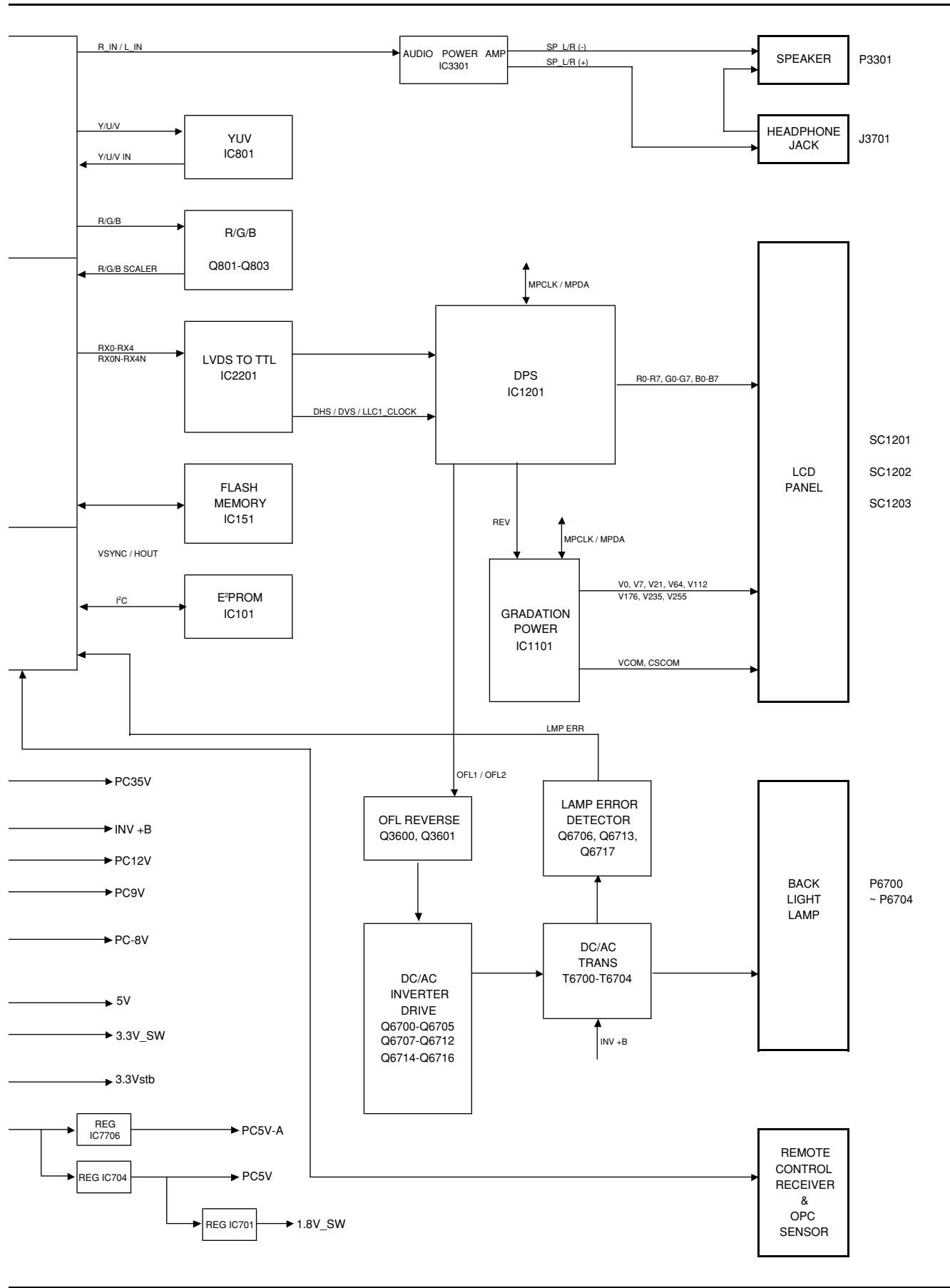
1	2	3	4	5	6	7	8	9	10
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INVERTER Unit**SUB Unit**

10	11	12	13	14	15	16	17	18	19
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BLOCK DIAGRAM





10	11	12	13	14	15	16	17	18	19
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OVERALL WIRING DIAGRAM

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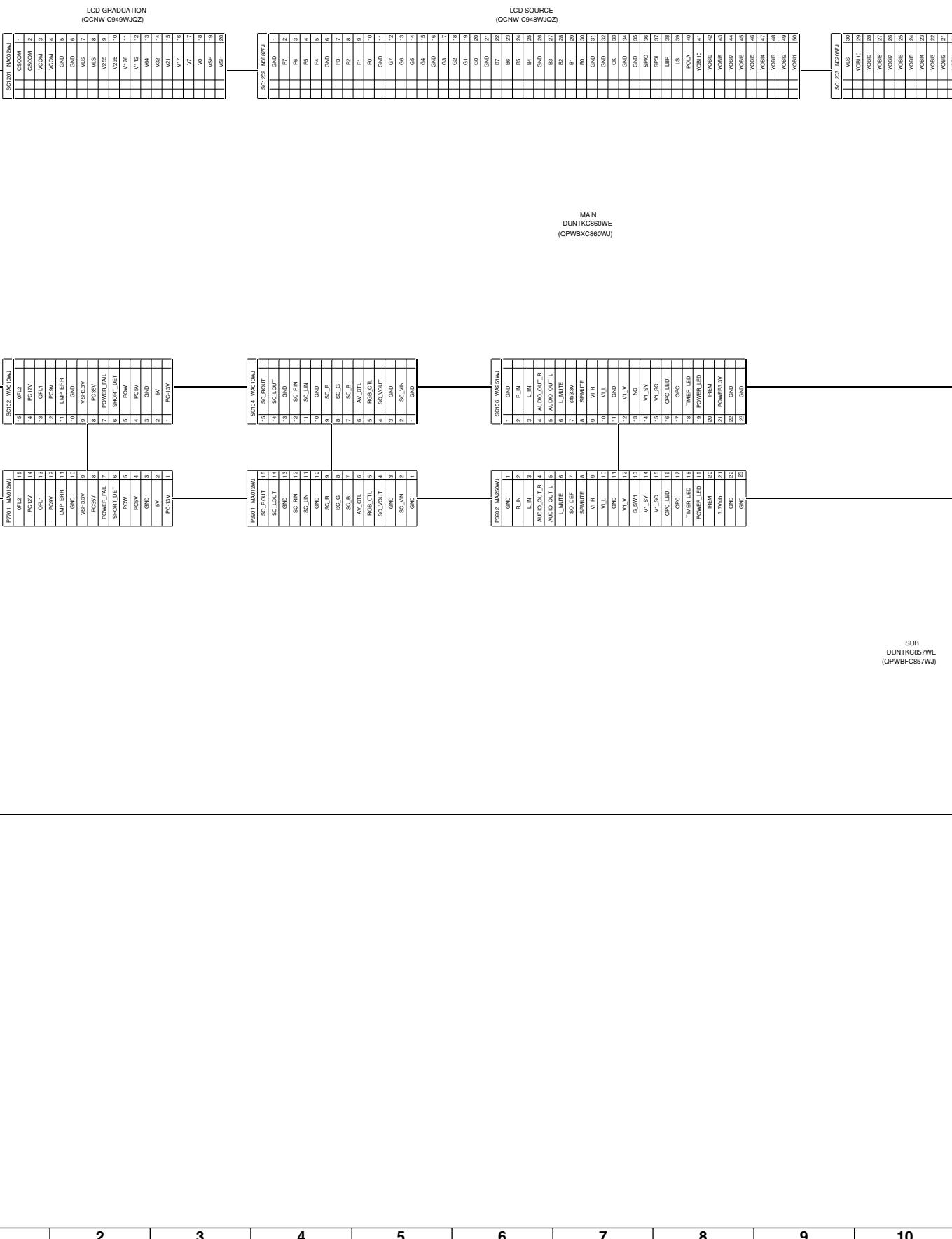
E

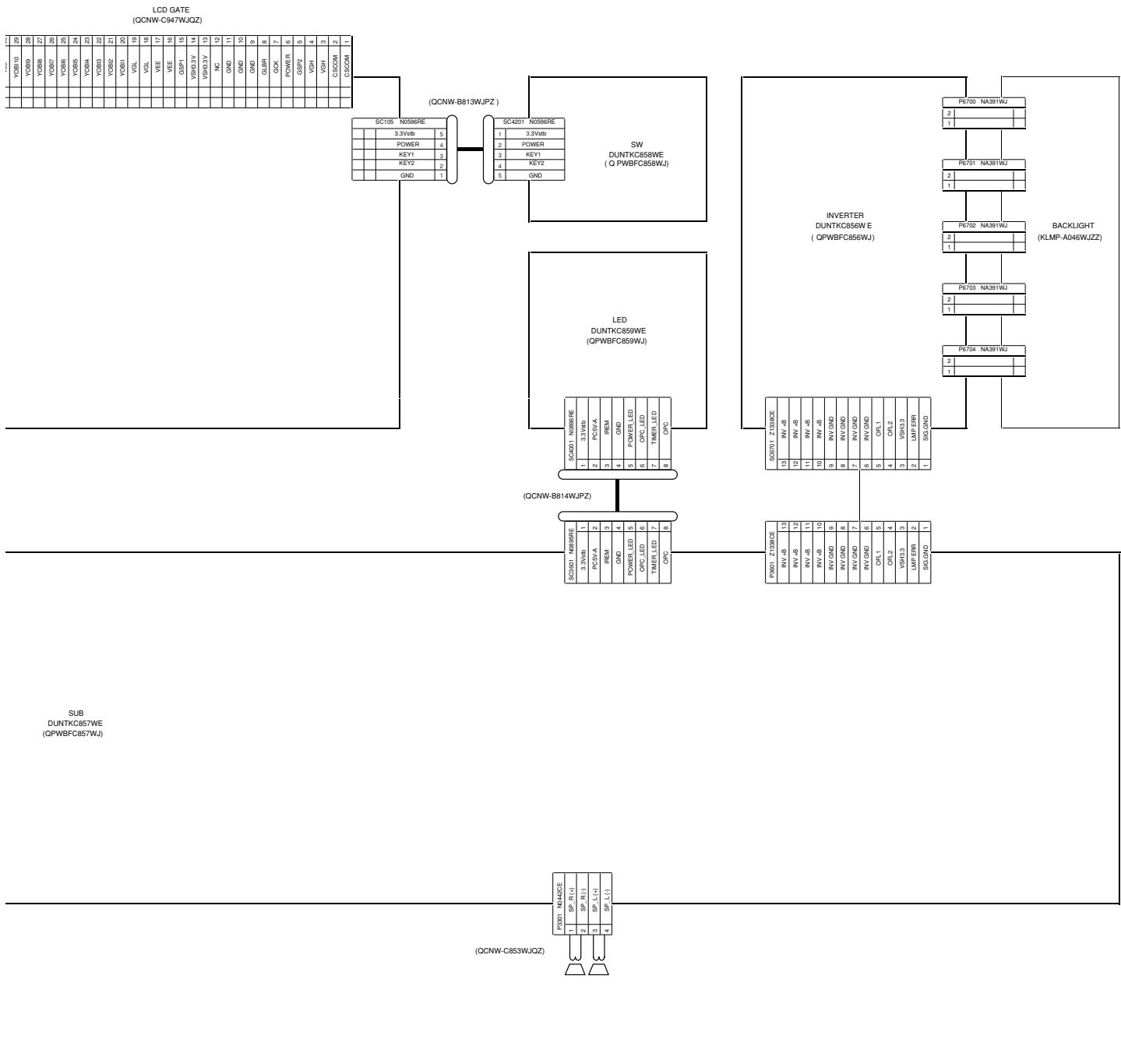
D

C

B

A





DESCRIPTION OF SCHEMATIC DIAGRAM

VOLTAGE MEASUREMENT CONDITION:

1. The voltages at test points are measured on the stable supply voltage of AC 220-240V. Signals are fed by a colour bar signal generator for servicing purpose and the above voltages are measured with a 20k ohm/V tester.

INDICATION OF RESISTOR & CAPACITOR:

RESISTOR

1. The unit of resistance “Ω” is omitted.
(K=kΩ=1000 Ω, M=MΩ).
2. All resistors are ± 5%, unless otherwise noted.
(J= ± 5%, F= ± 1%, D= ± 0.5%)
3. All resistors are 1/16W, unless otherwise noted.
4. All resistors are Carbon type, unless otherwise noted.

©: Solid Ⓣ: Cement

◎: Oxide Film Ⓡ: Special

Ⓜ: Metal Coating

CAPACITOR

1. All capacitors are μF, unless otherwise noted.
(P=pF=μμF).
2. All capacitors are 50V, unless otherwise noted.
3. All capacitors are Ceramic type, unless otherwise noted.

(ML): Mylar (TA): Tantalum

(PF): Polypro Film (ST): Styrol

CAUTION:

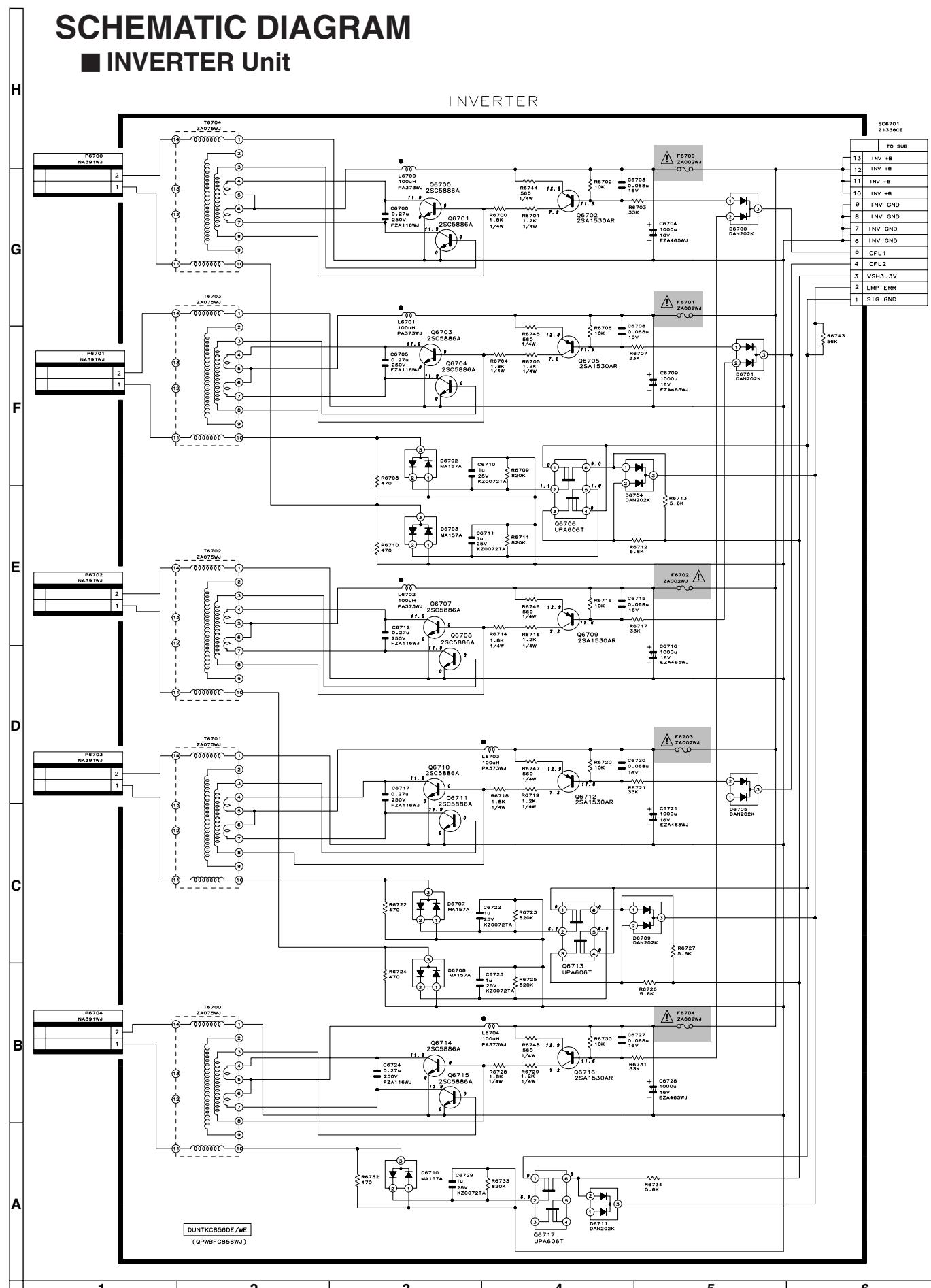
This circuit diagram is original one, therefore there may be a slight difference from yours.

IMPORTANT SAFETY NOTICE:

PARTS MARKED WITH “⚠”() ARE
IMPORTANT FOR MAINTAINING THE SAFETY OF
THE SET. BE SURE TO REPLACE THESE PARTS
WITH SPECIFIED ONES FOR MAINTAINING THE
SAFETY AND PERFORMANCE OF THE SET.

SCHEMATIC DIAGRAM

■ INVERTER Unit

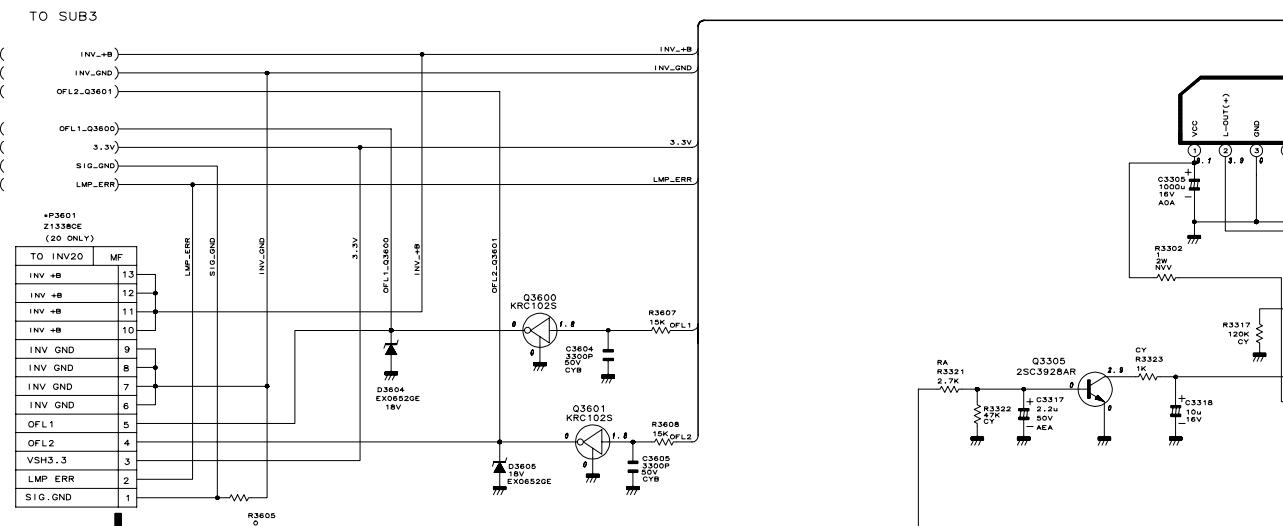


1	2	3	4	5	6
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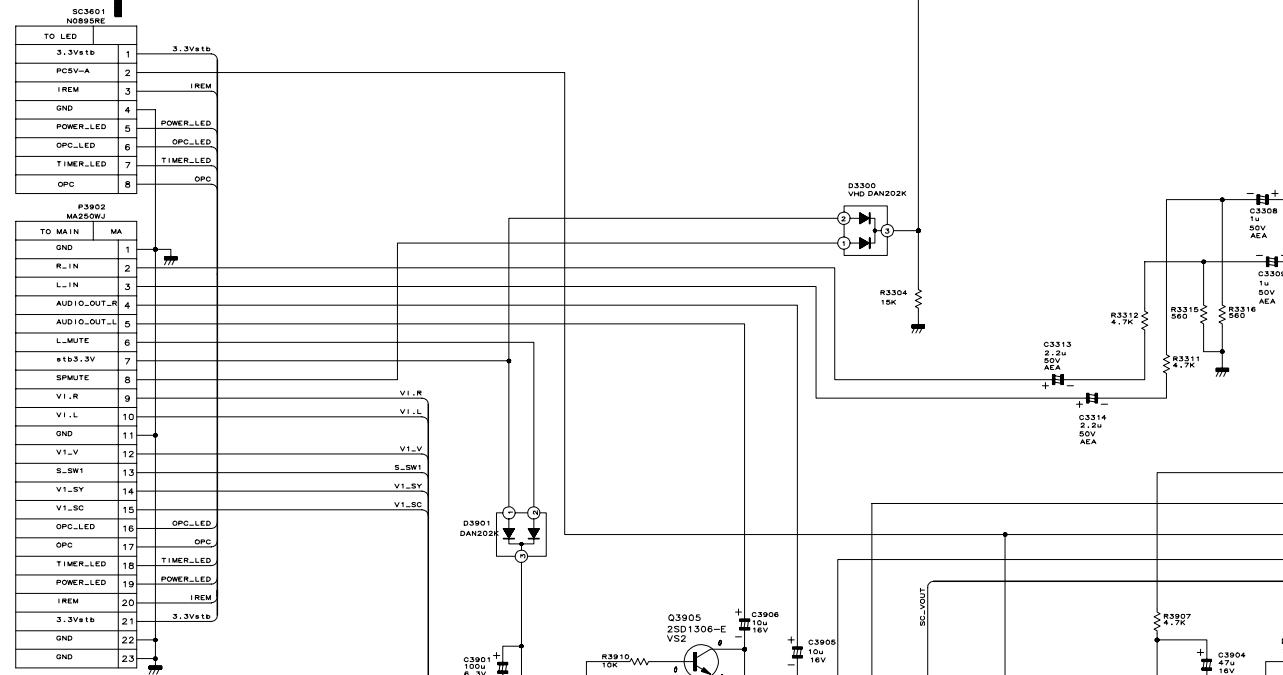
■ SUB Unit-1/2

SUB 1 (AV_TERMINAL)

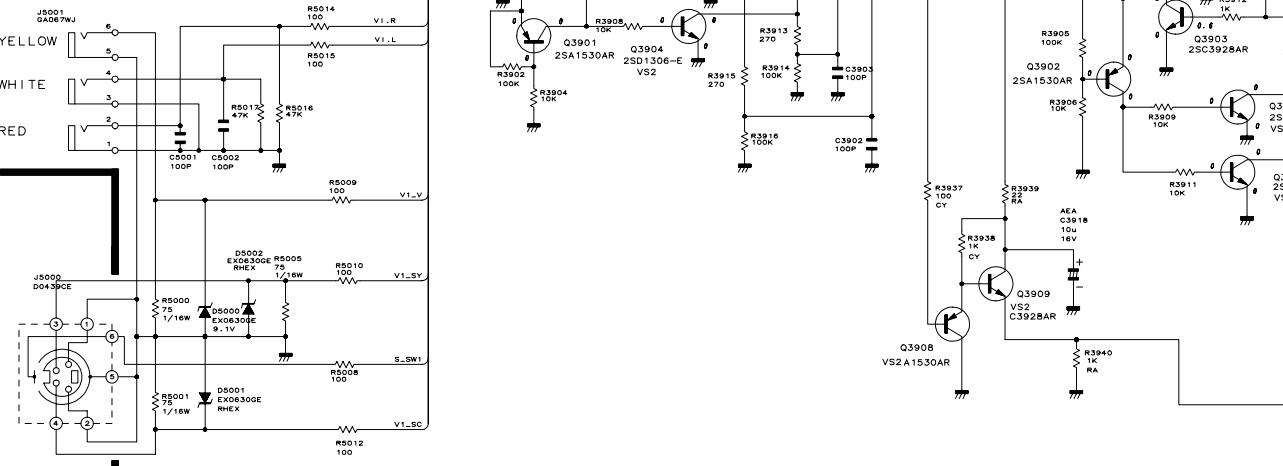
H



G



F

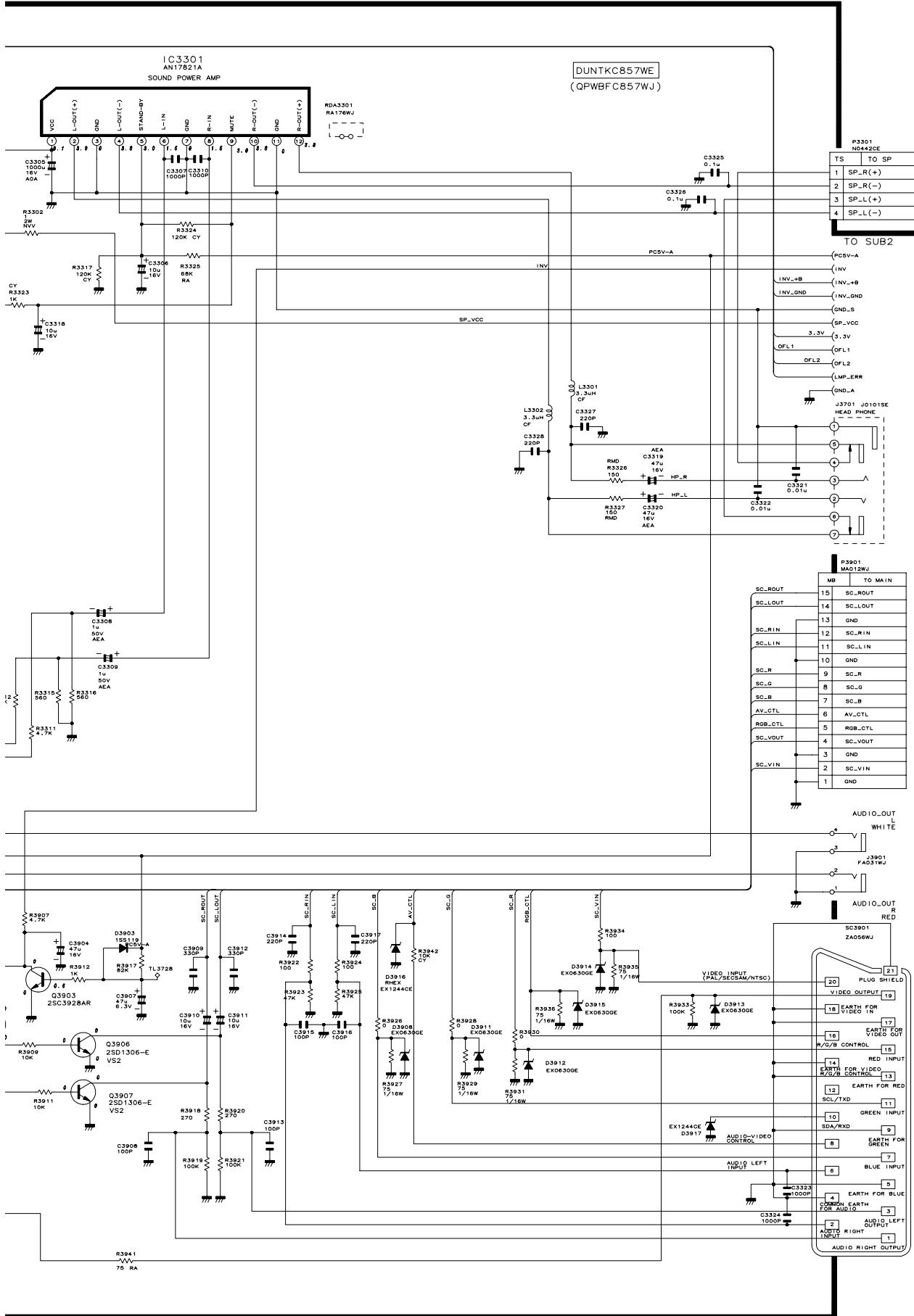


C

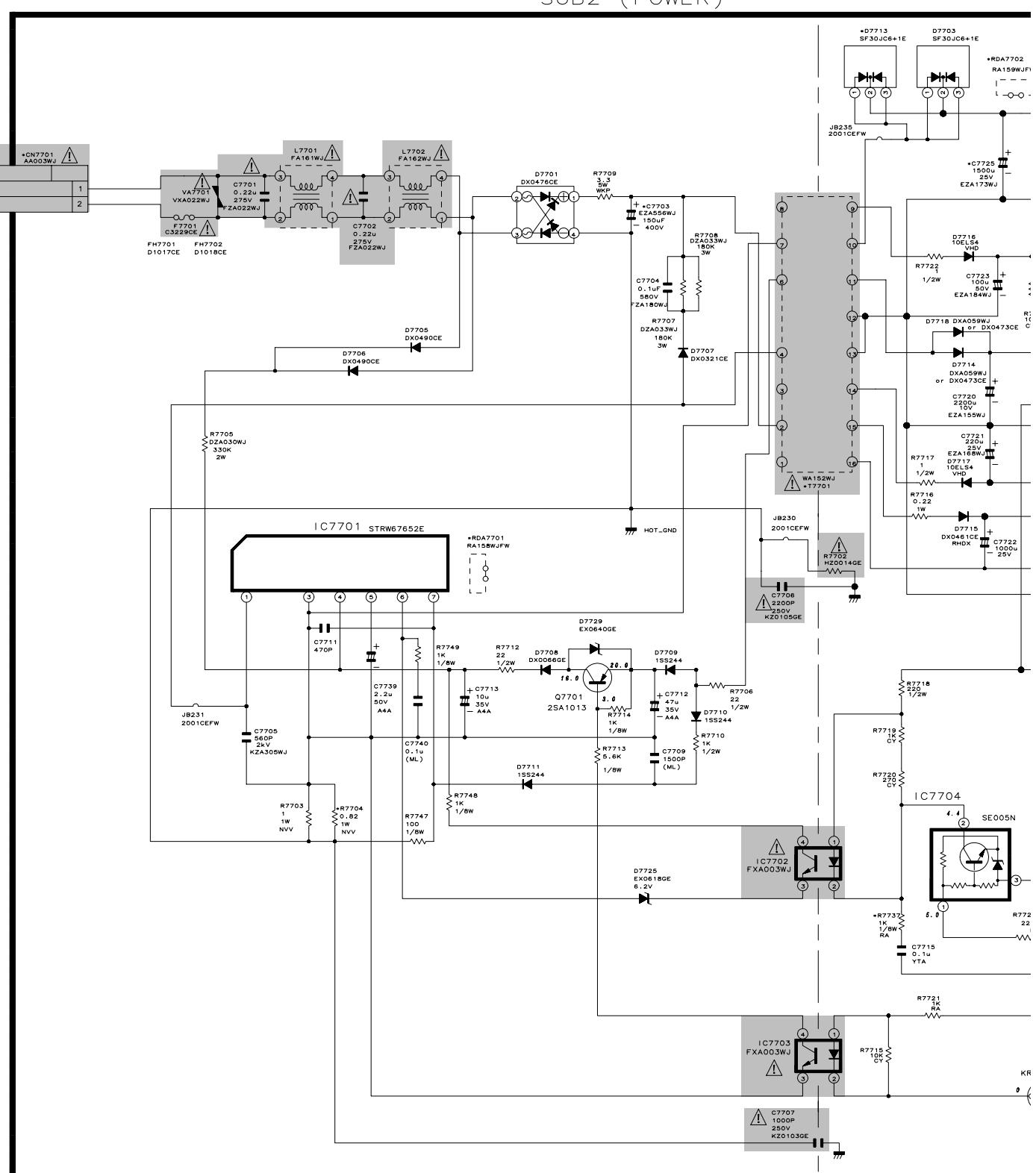
B

A

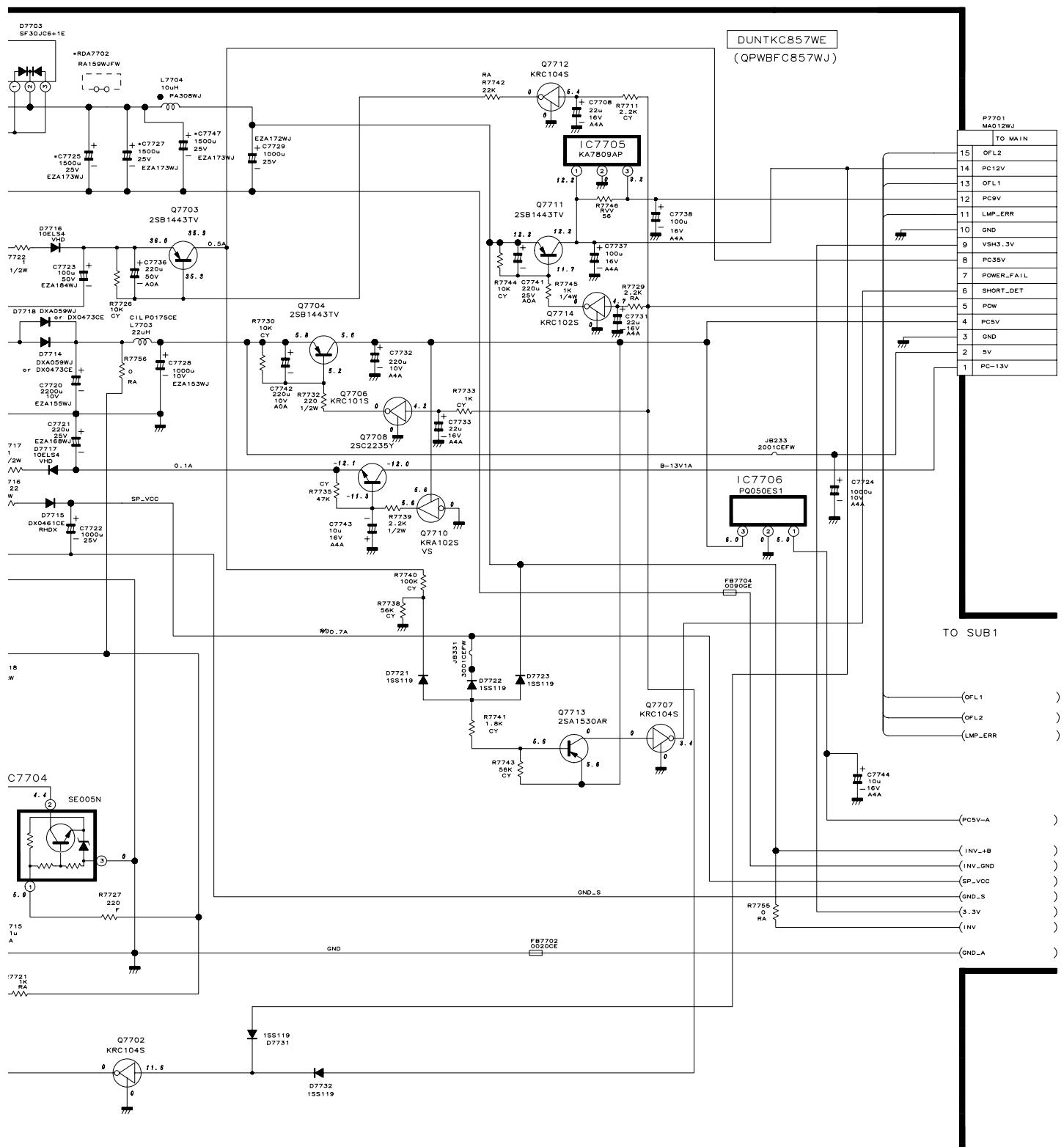
1 2 3 4 5 6 7 8 9 10



■ SUB Unit-2/2



1	2	3	4	5	6	7	8	9	10
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■ MAIN Unit-1/3

MAIN 1 (LOC)

H

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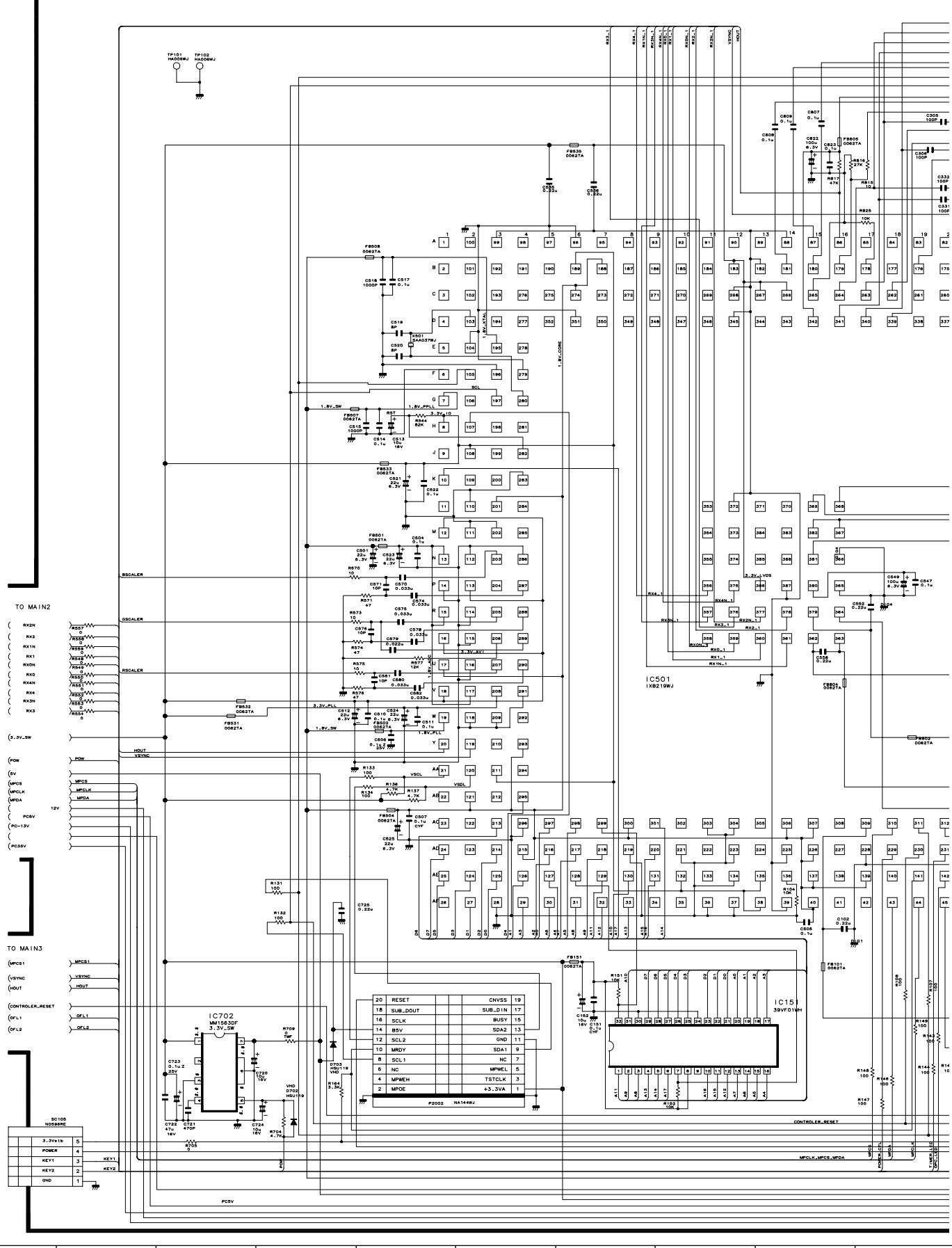
E

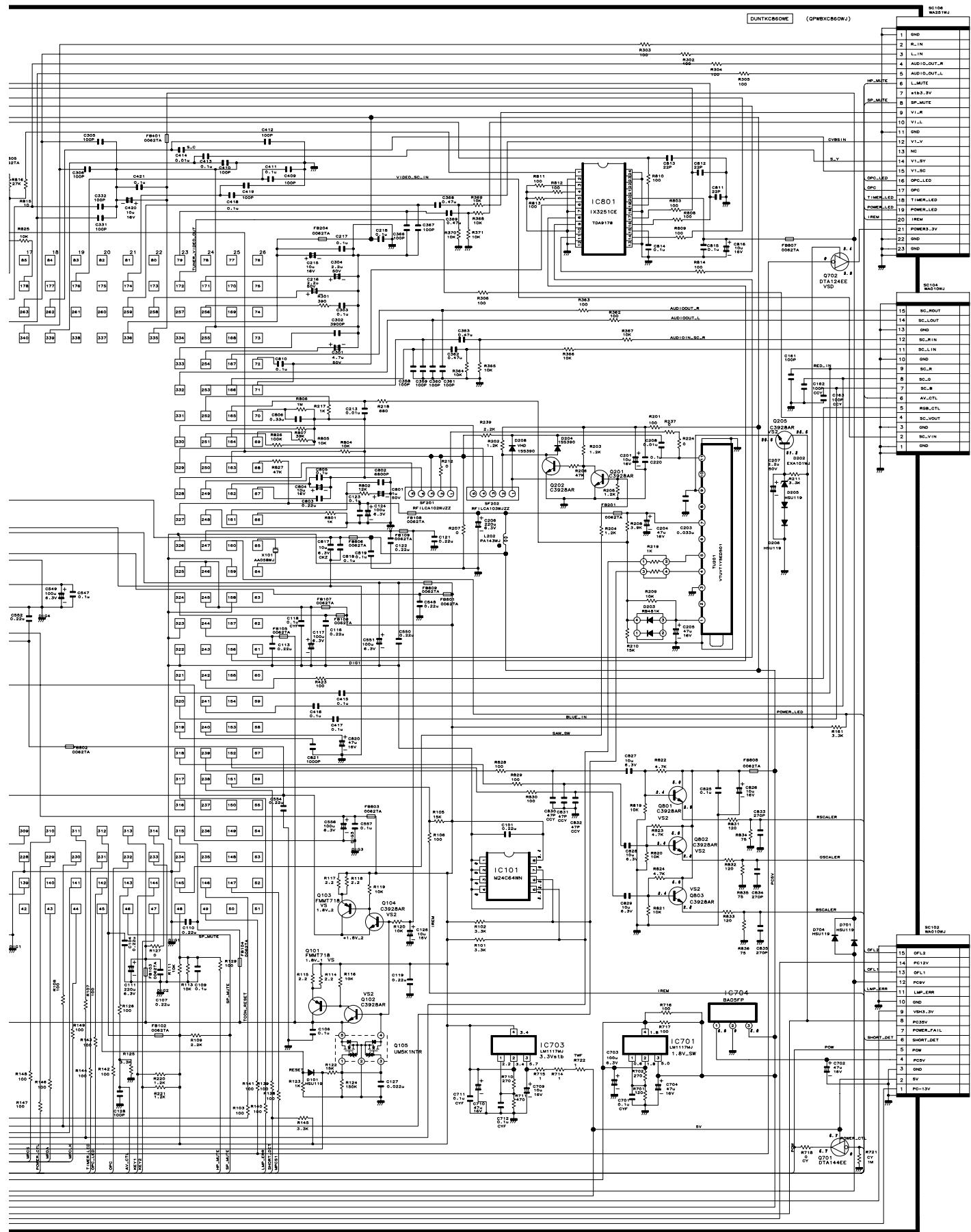
D

C

B

A

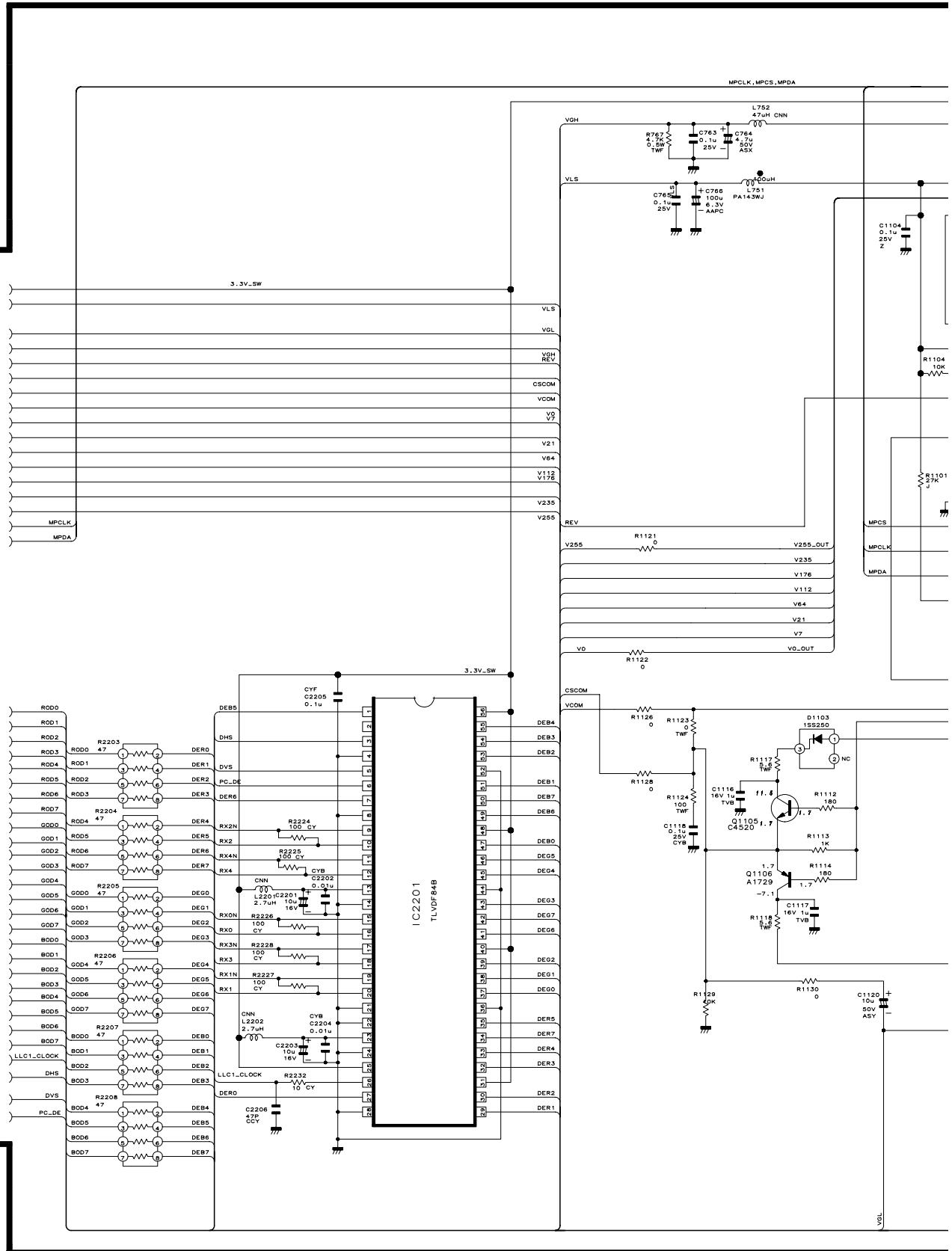




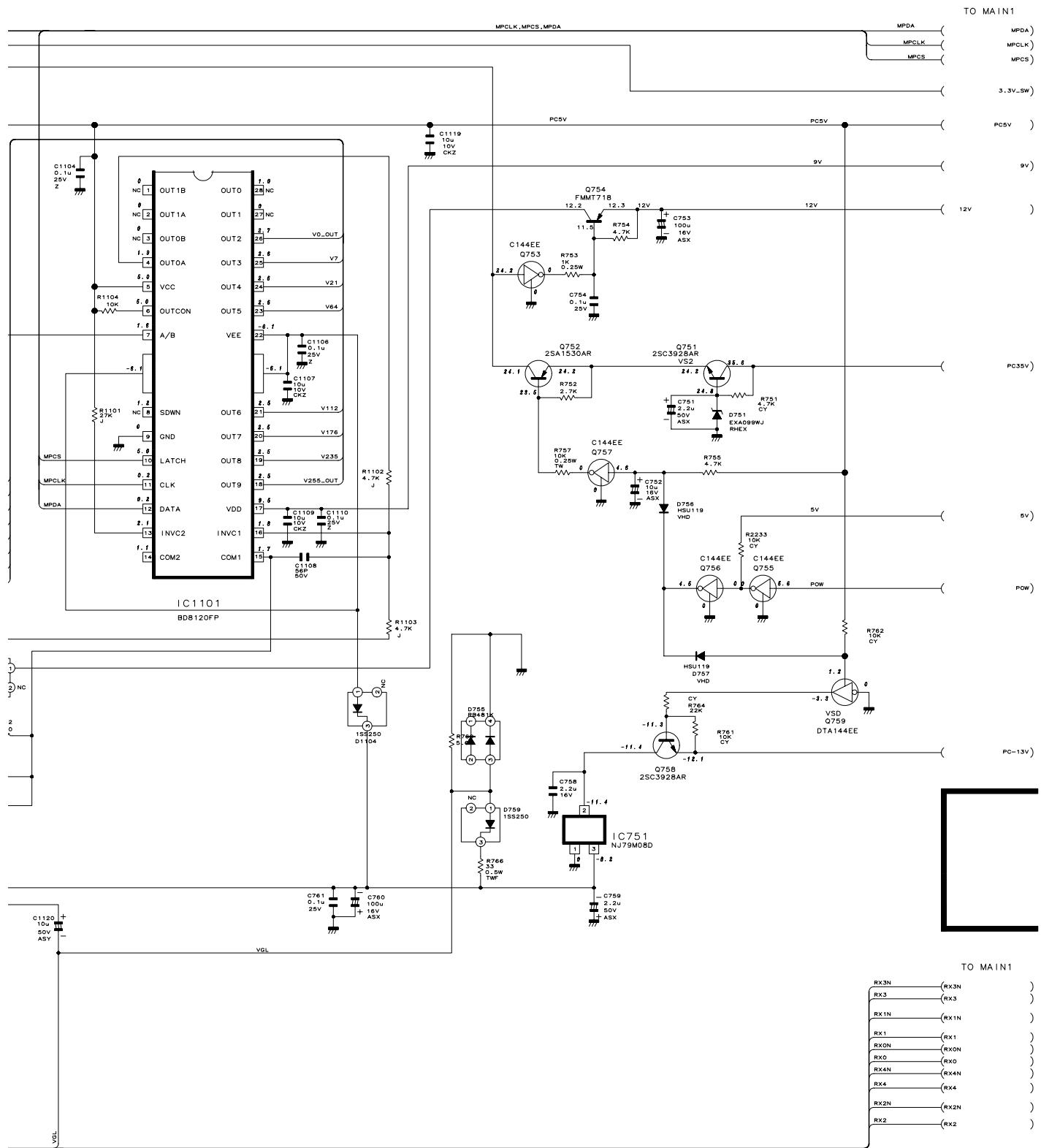
10	11	12	13	14	15	16	17	18	19
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■ MAIN Unit-2/3

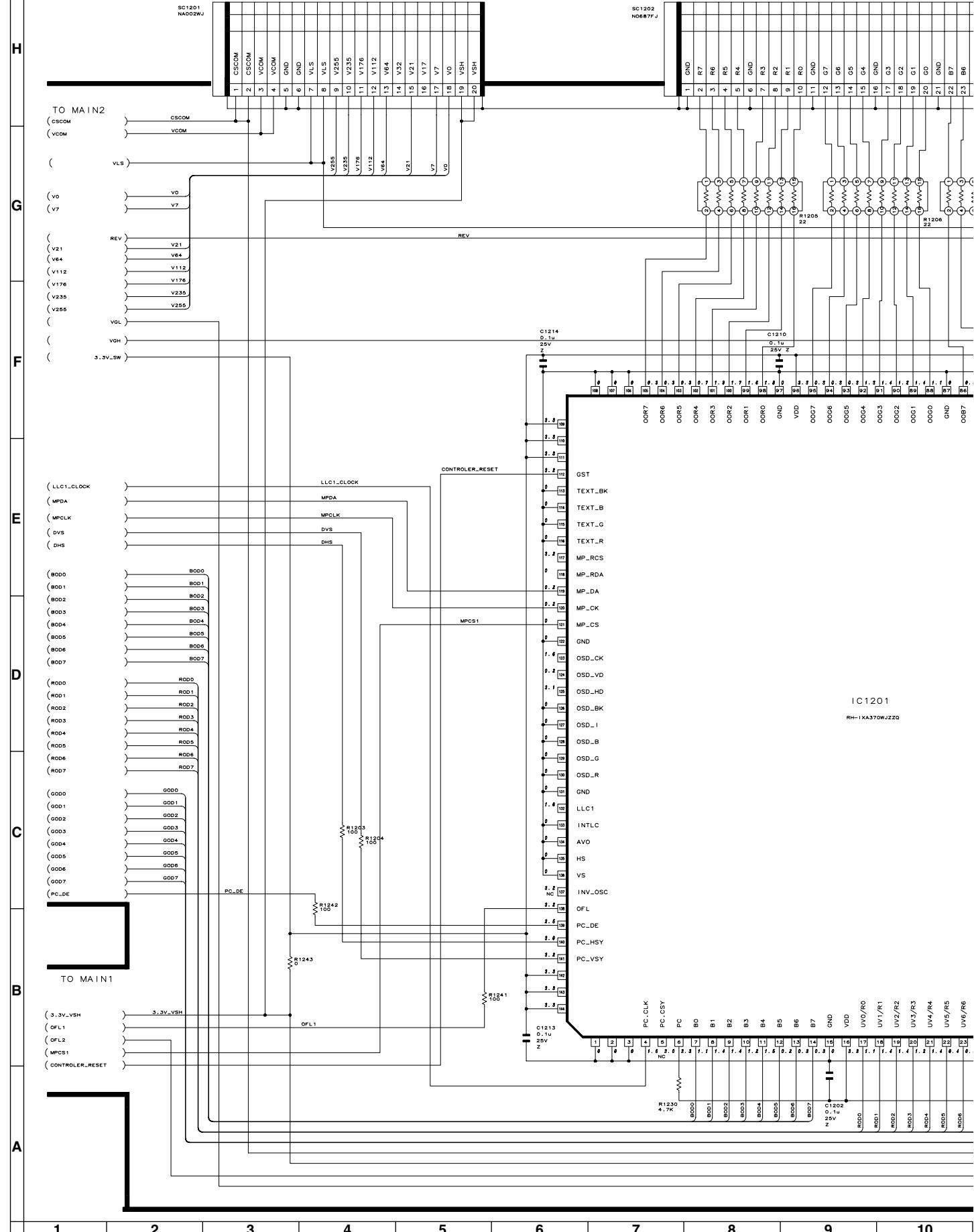
MAIN2 (INTERFACE)

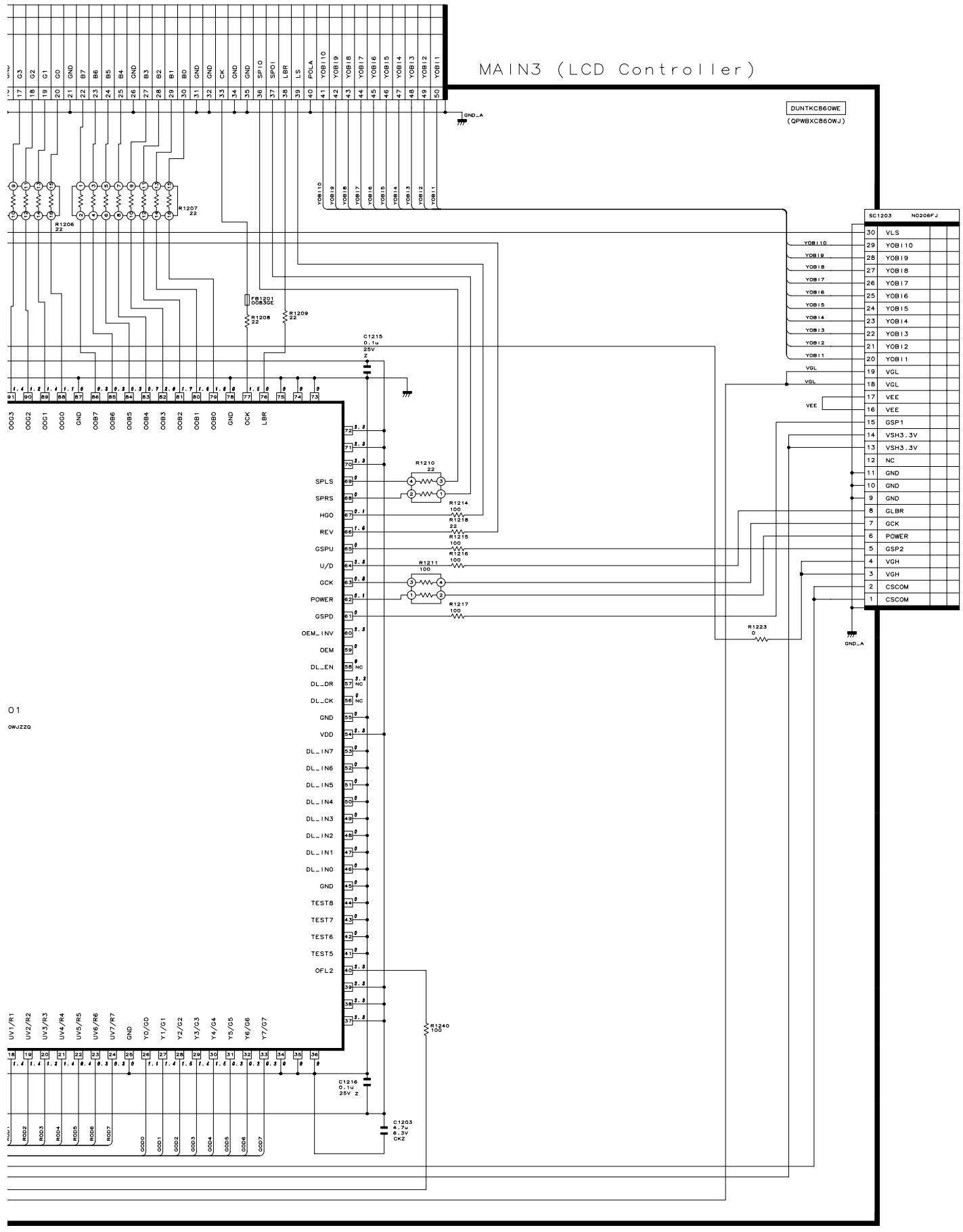
H
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E
D
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DUNTKC860WE
(QPWBXC860WJ)



■ MAIN Unit-3/3





10 11 12 13 14 15 16 17 18 19

■ OPERATION Unit

H

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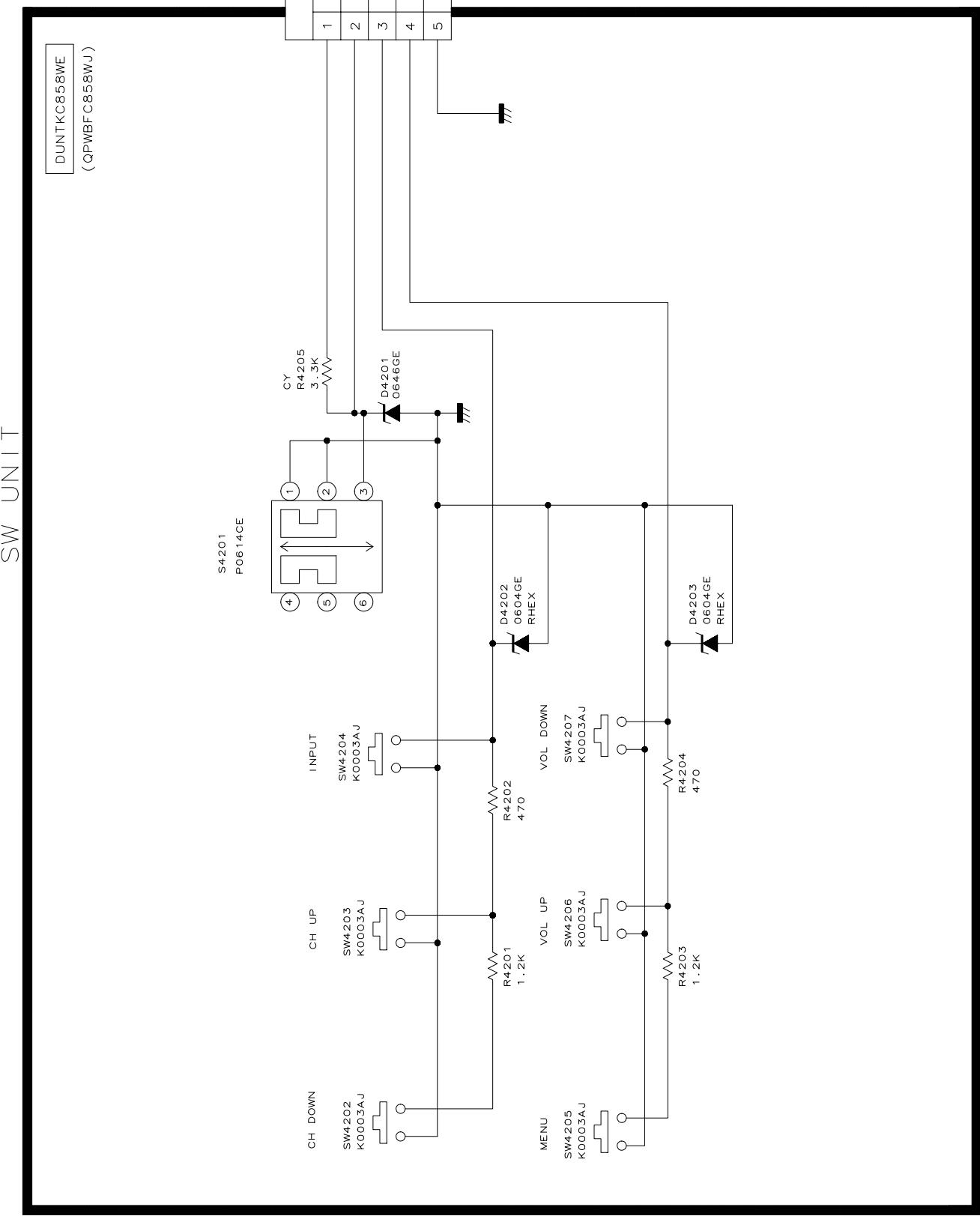
E

D

C

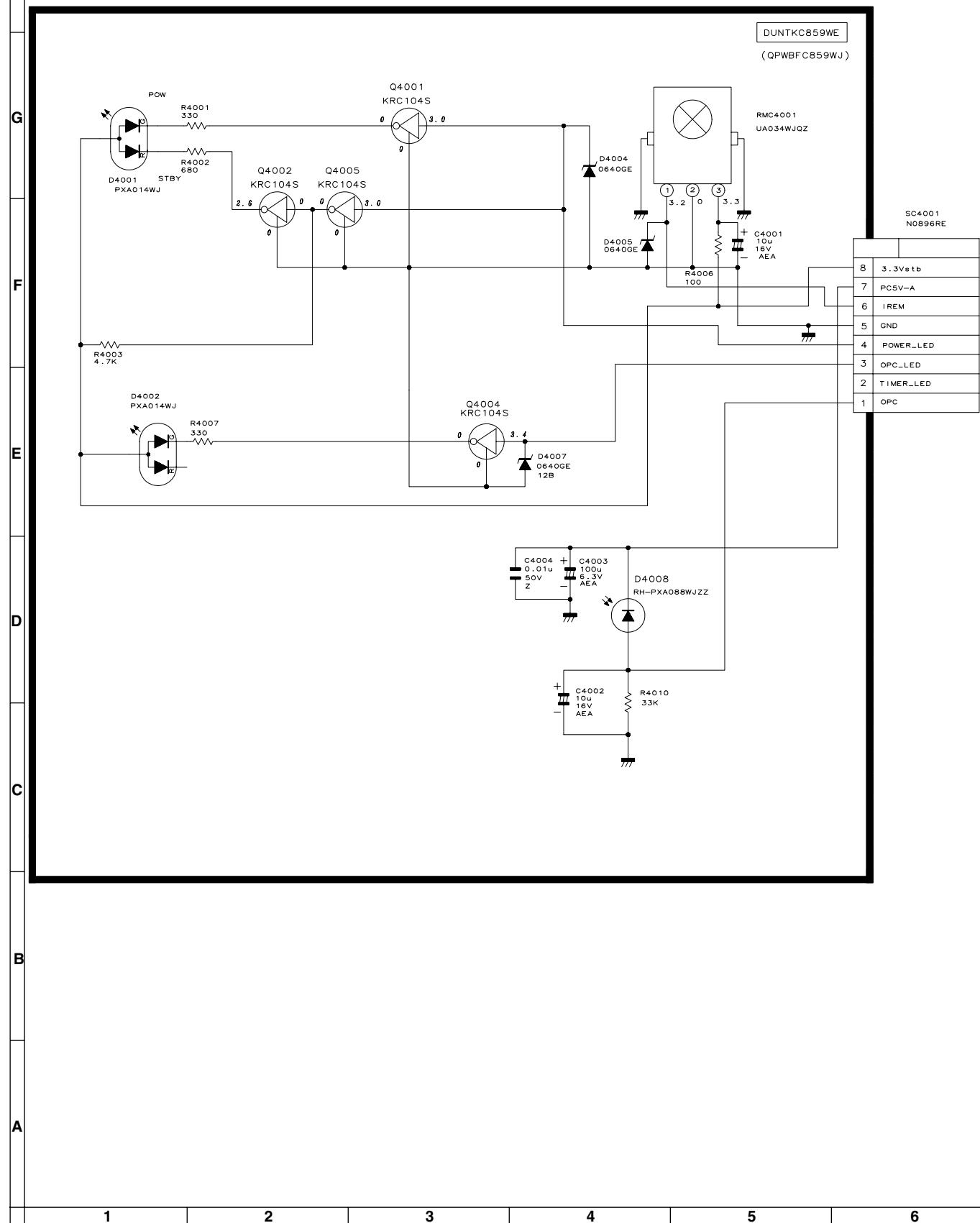
B

A

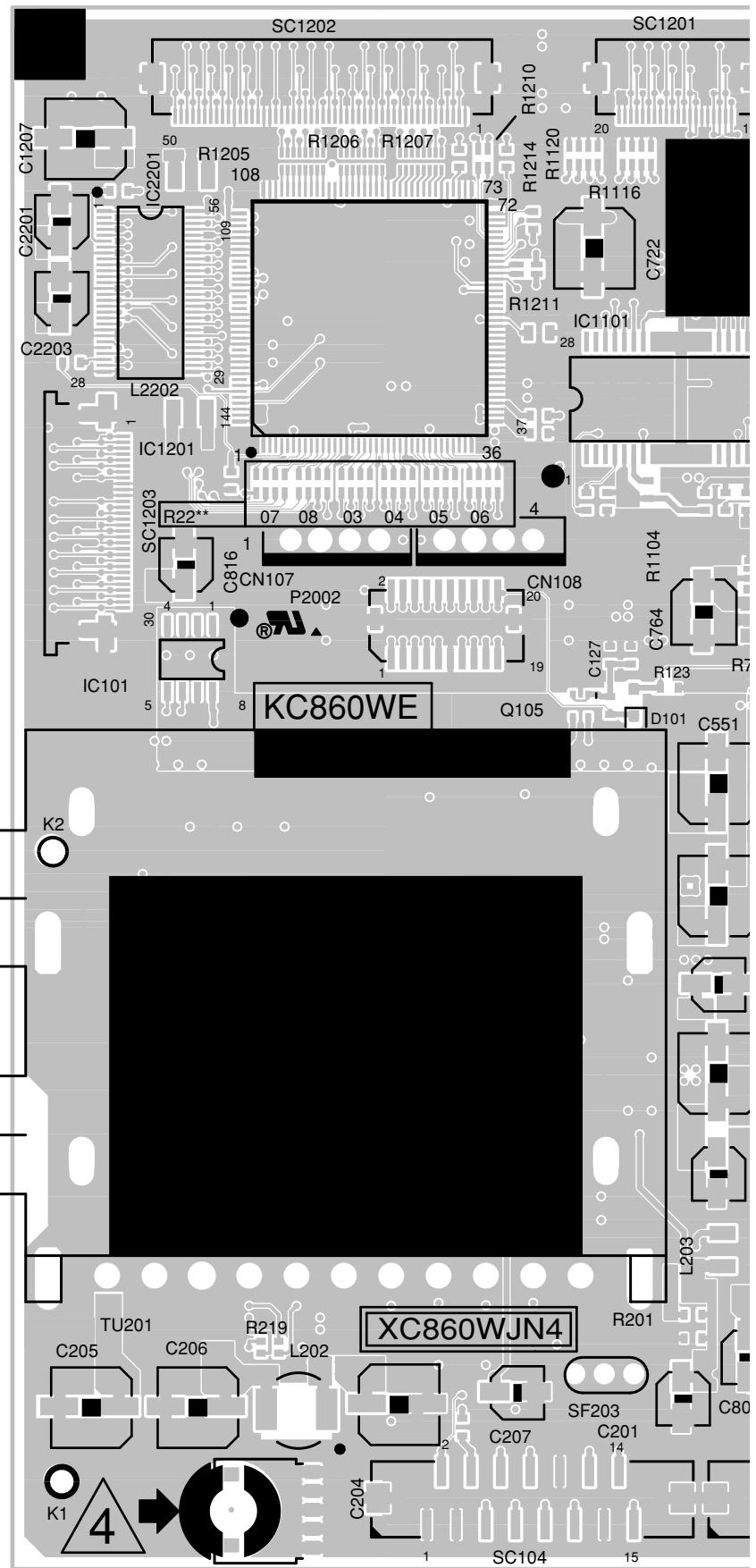


■ R/C, LED Unit

LED UNIT

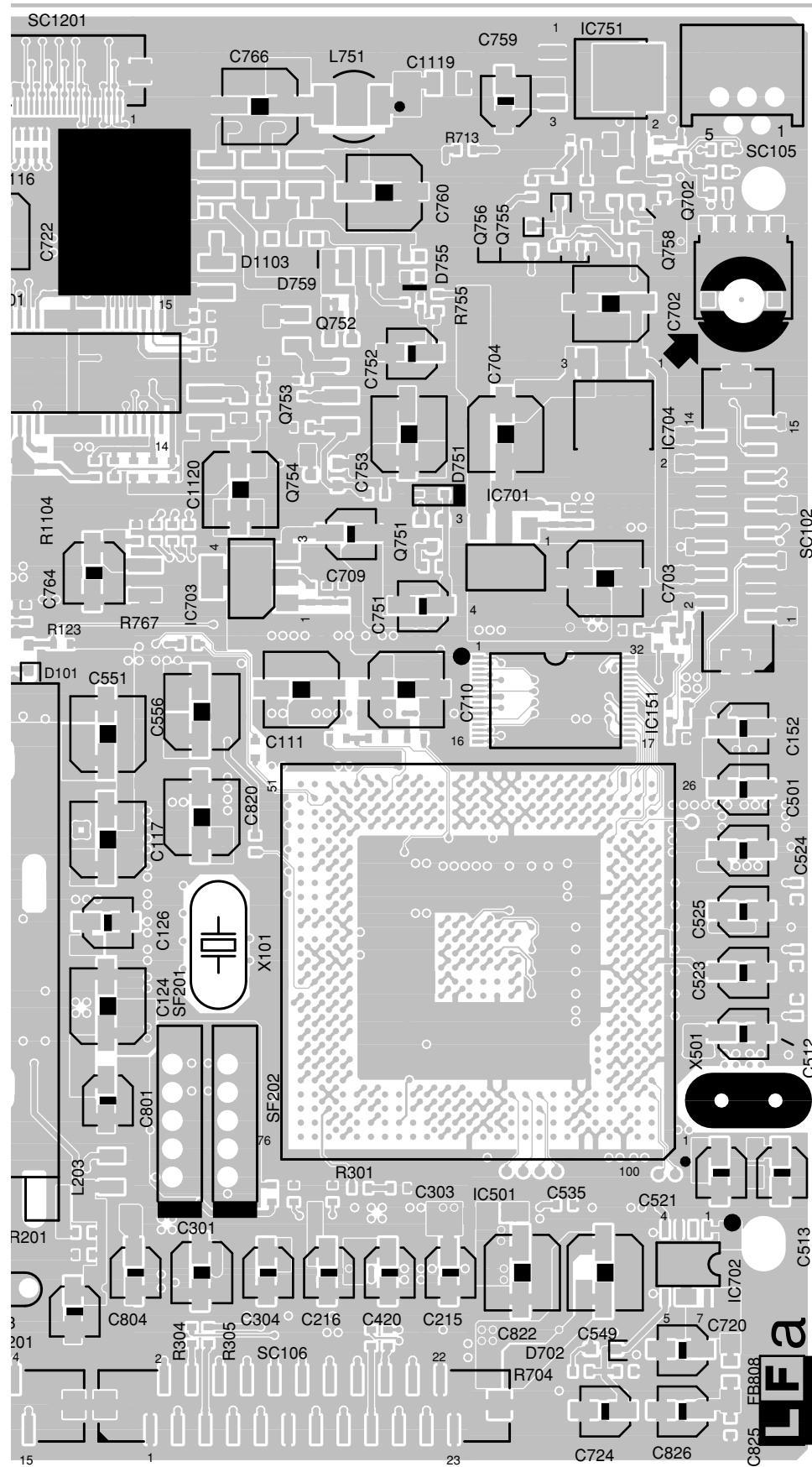


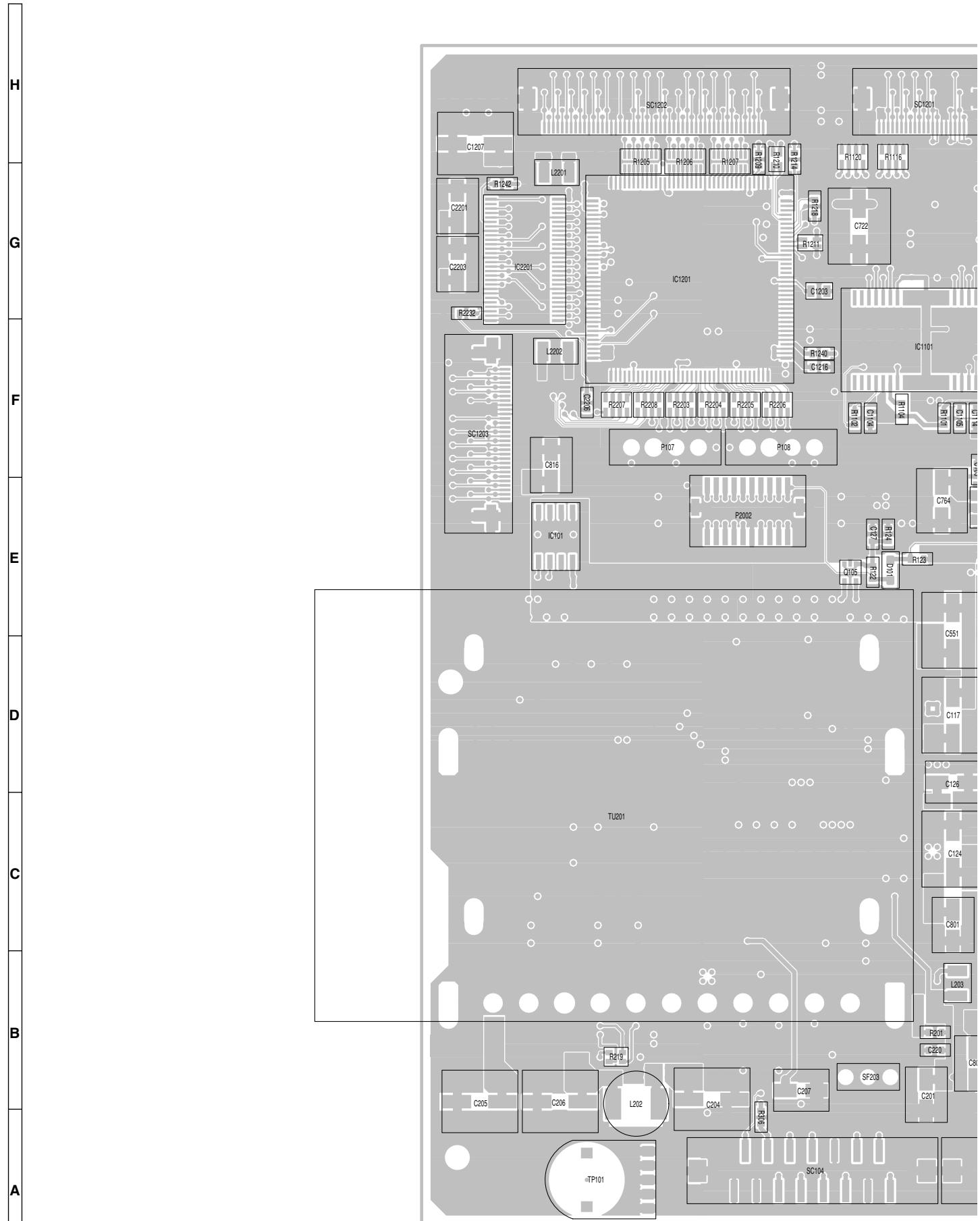
PRINTED WIRING BOARD ASSEMBLIES



MAIN Unit (Side-A)

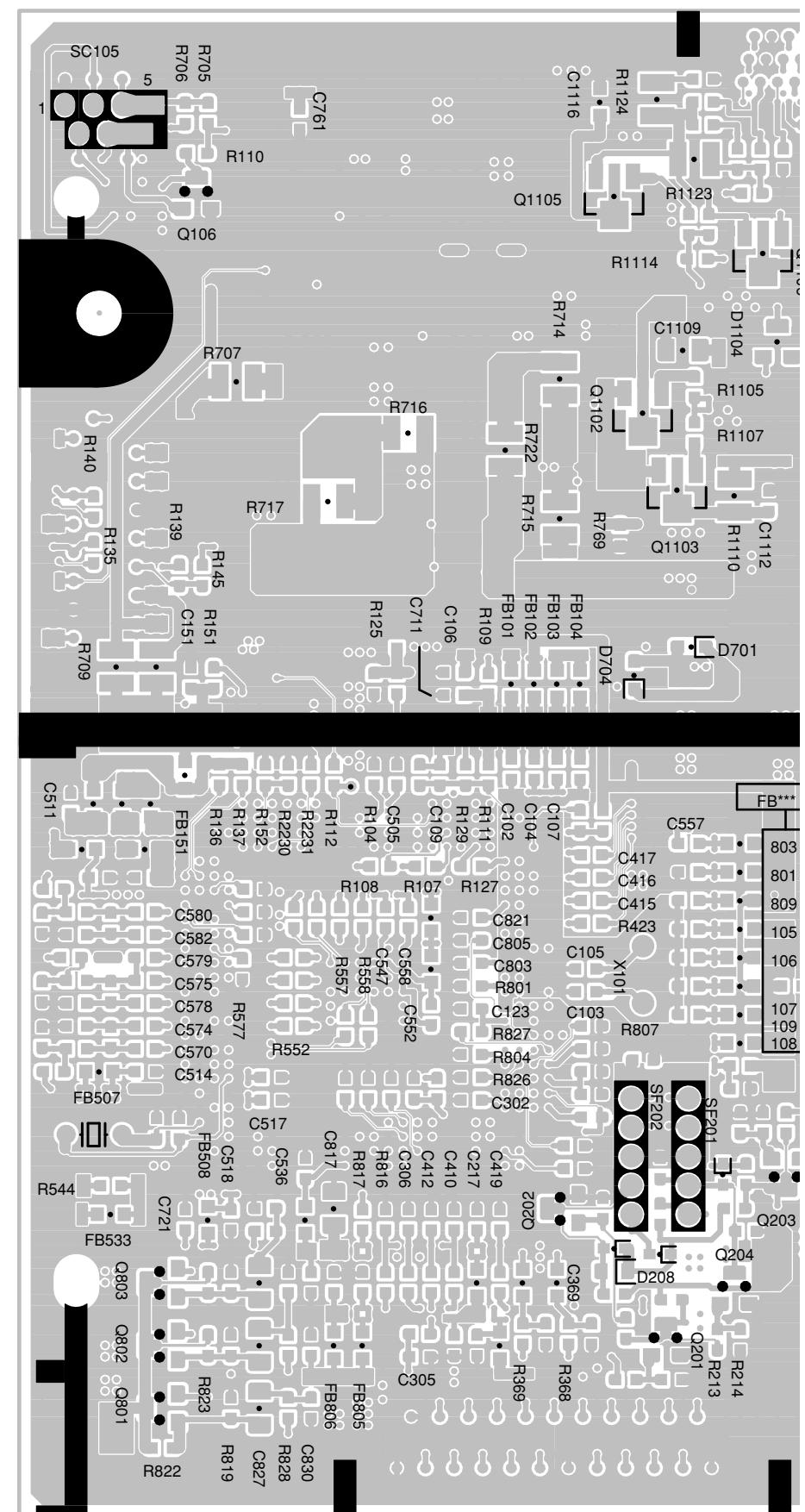
1	2	3	4	5	6	7	8	9	10
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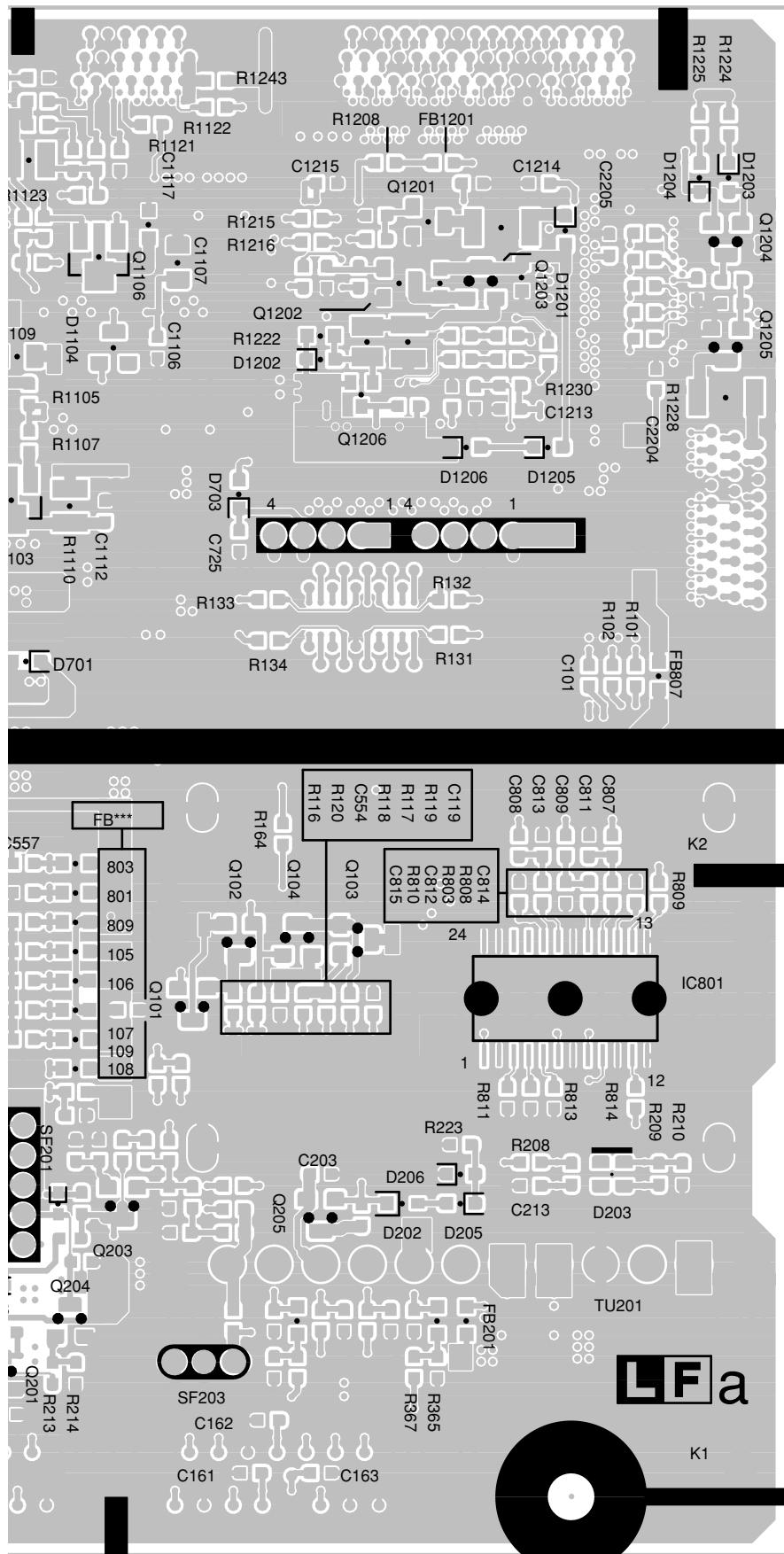
MAIN Unit (Chip Parts Side-A)

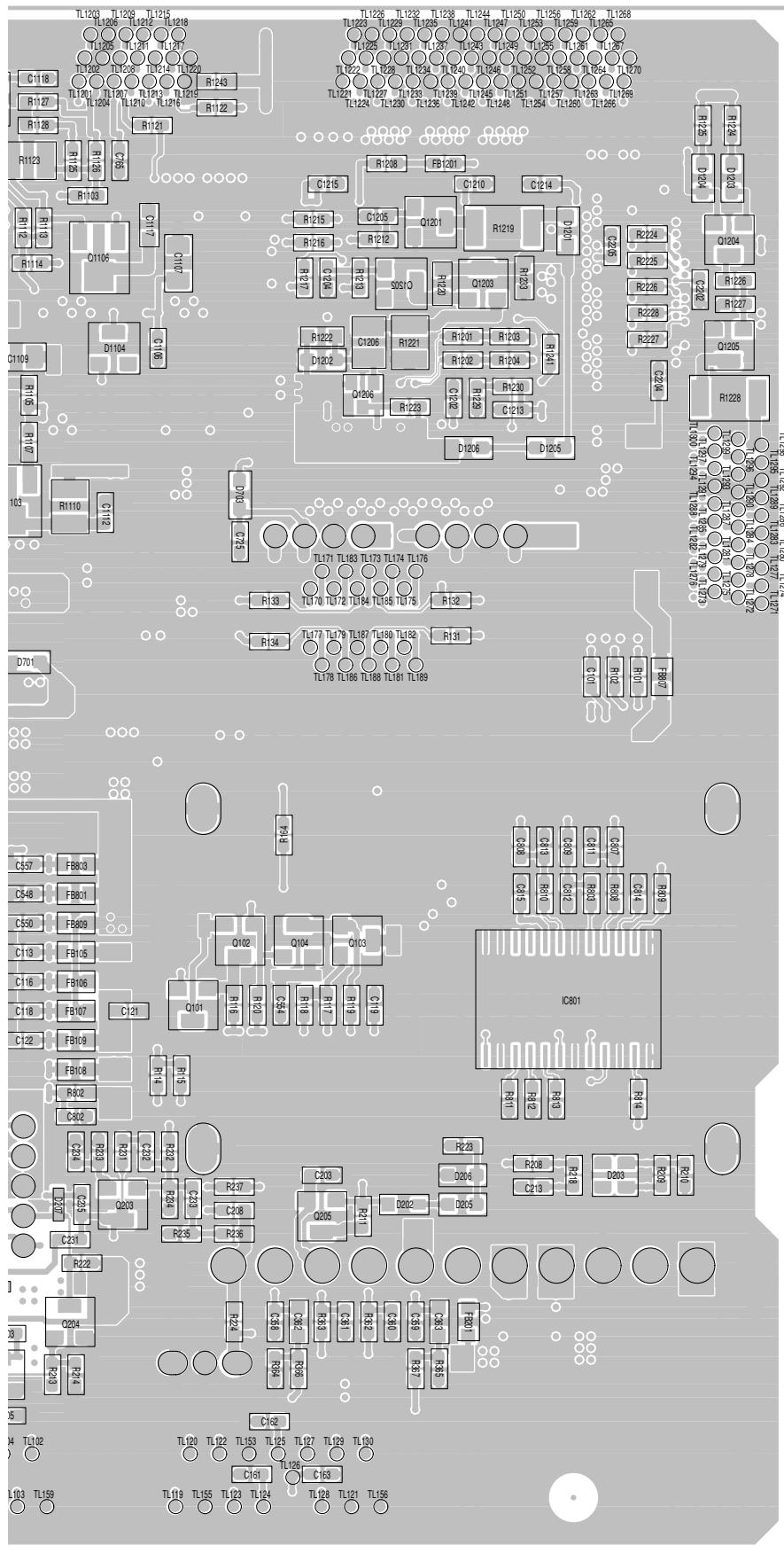
1	2	3	4	5	6	7	8	9	10
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H
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MAIN Unit (Side-B)

1	2	3	4	5	6	7	8	9	10
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H

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F

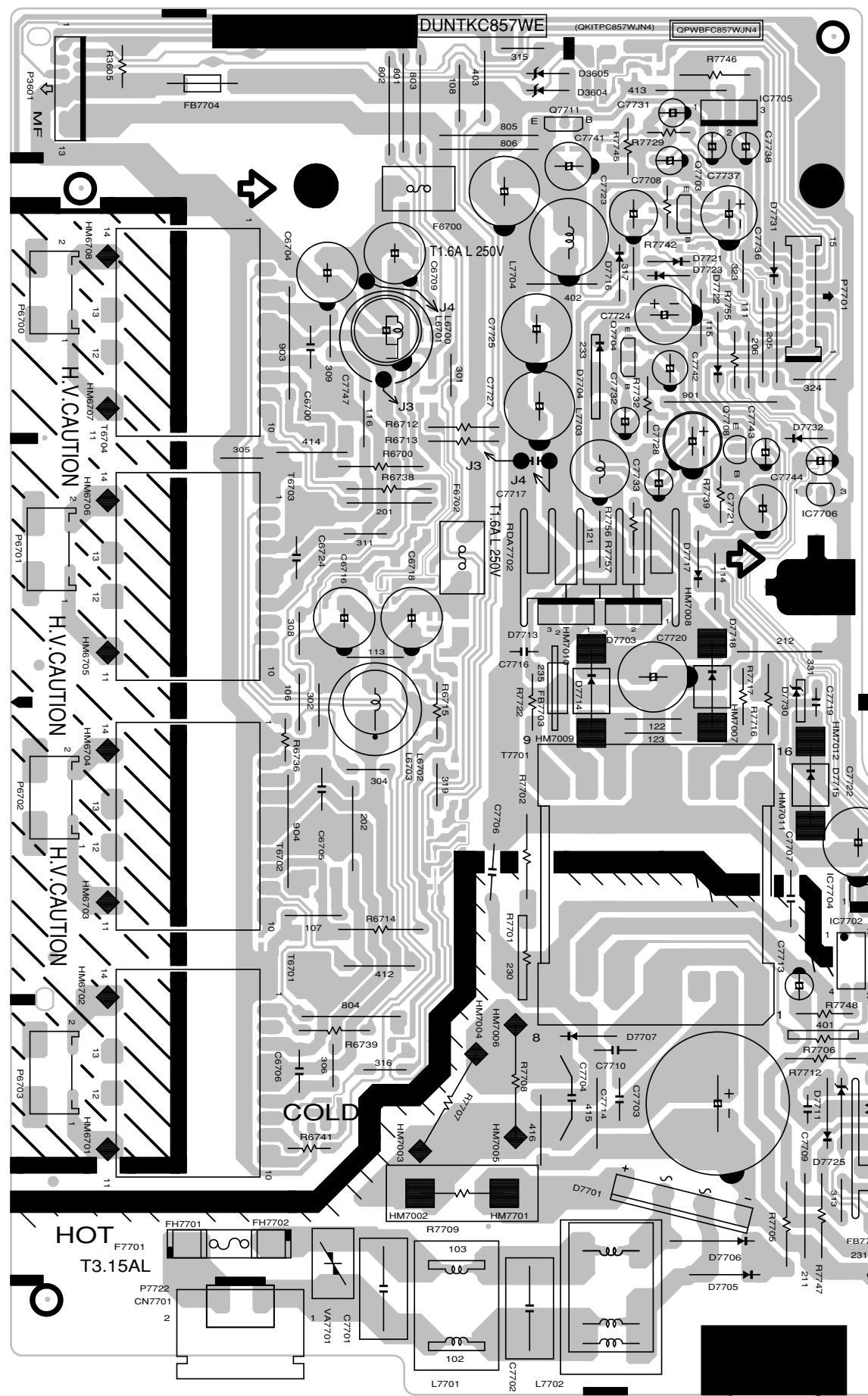
E

D

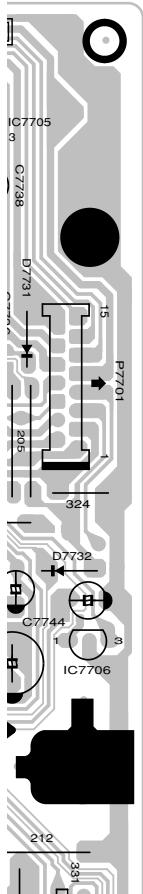
C

B

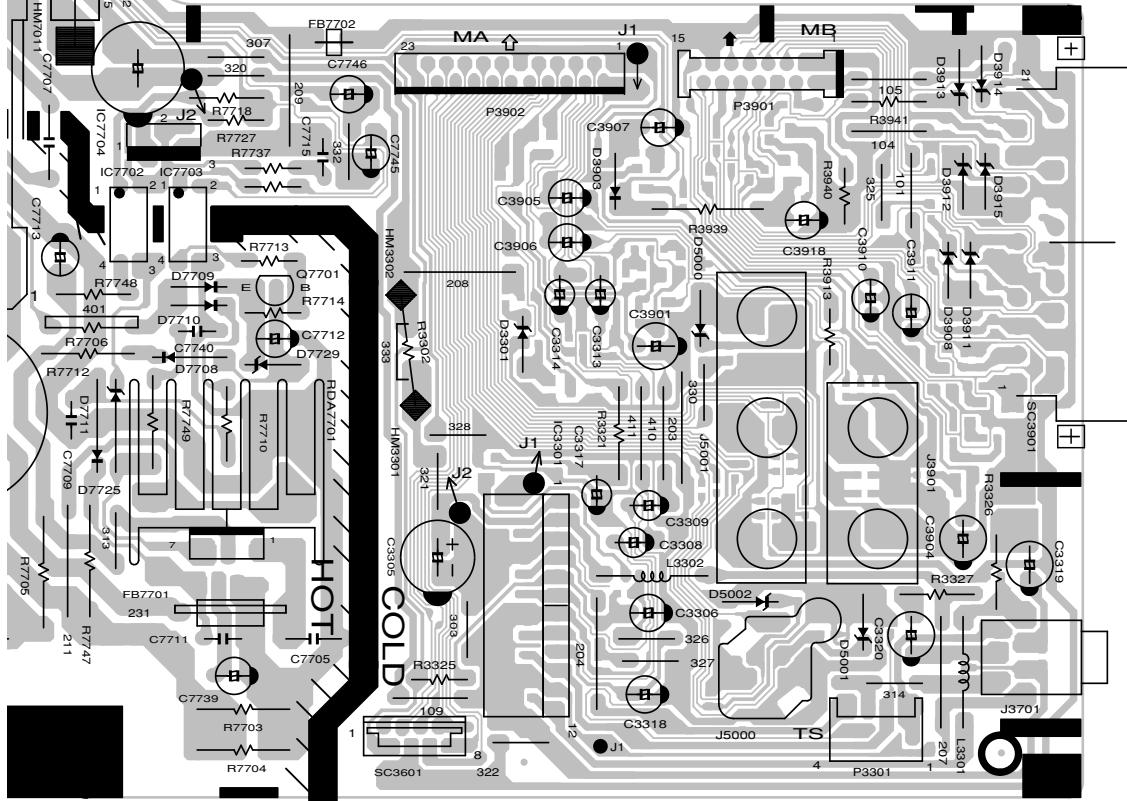
A



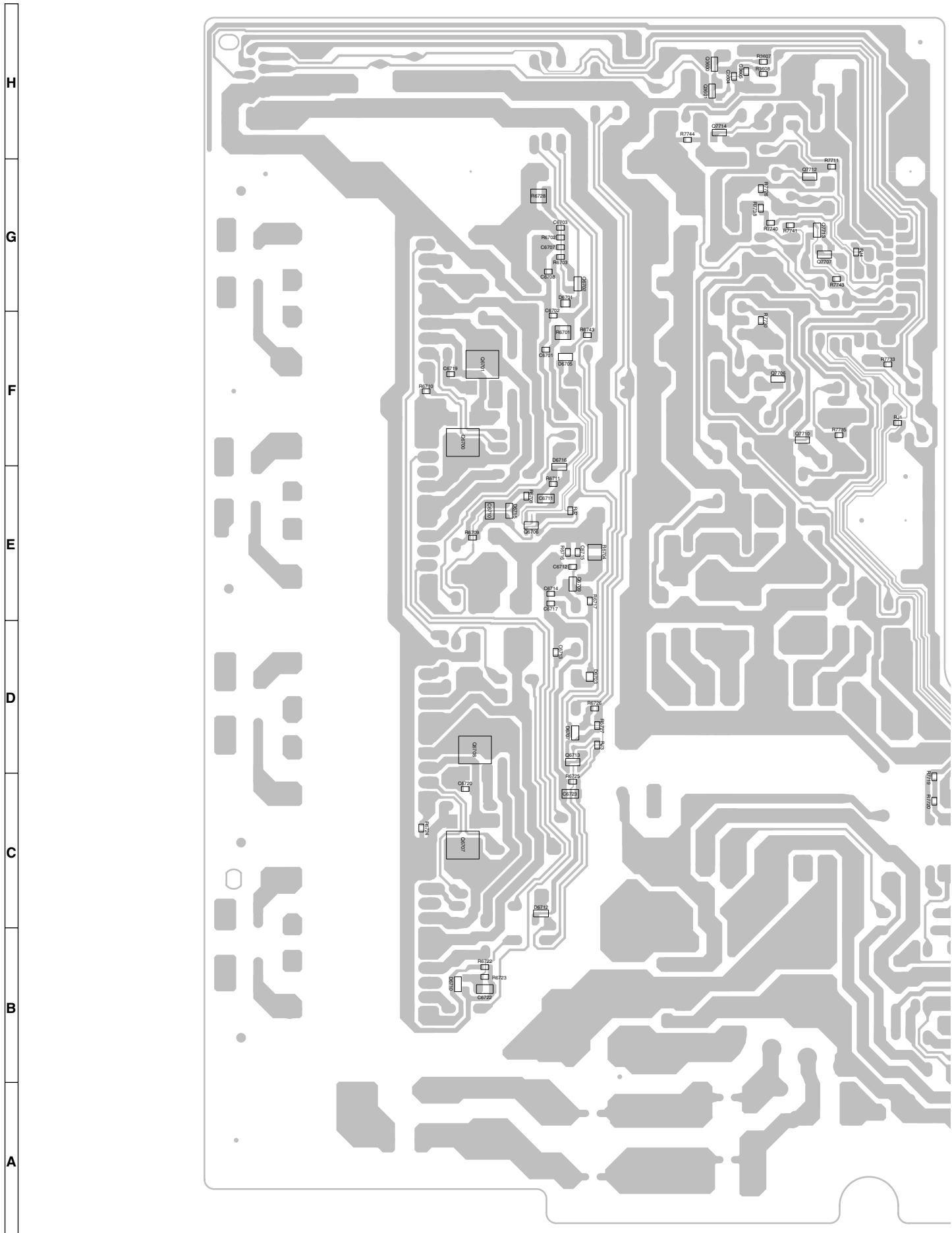
1	2	3	4	5	6	7	8	9	10
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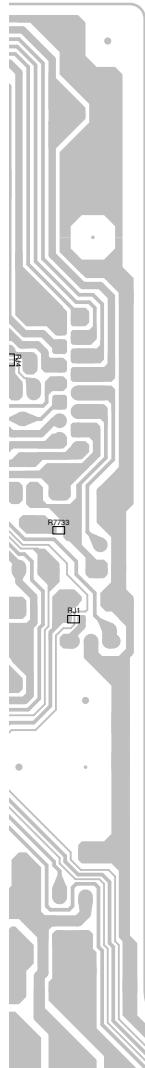


SUB Unit (Wiring Side)

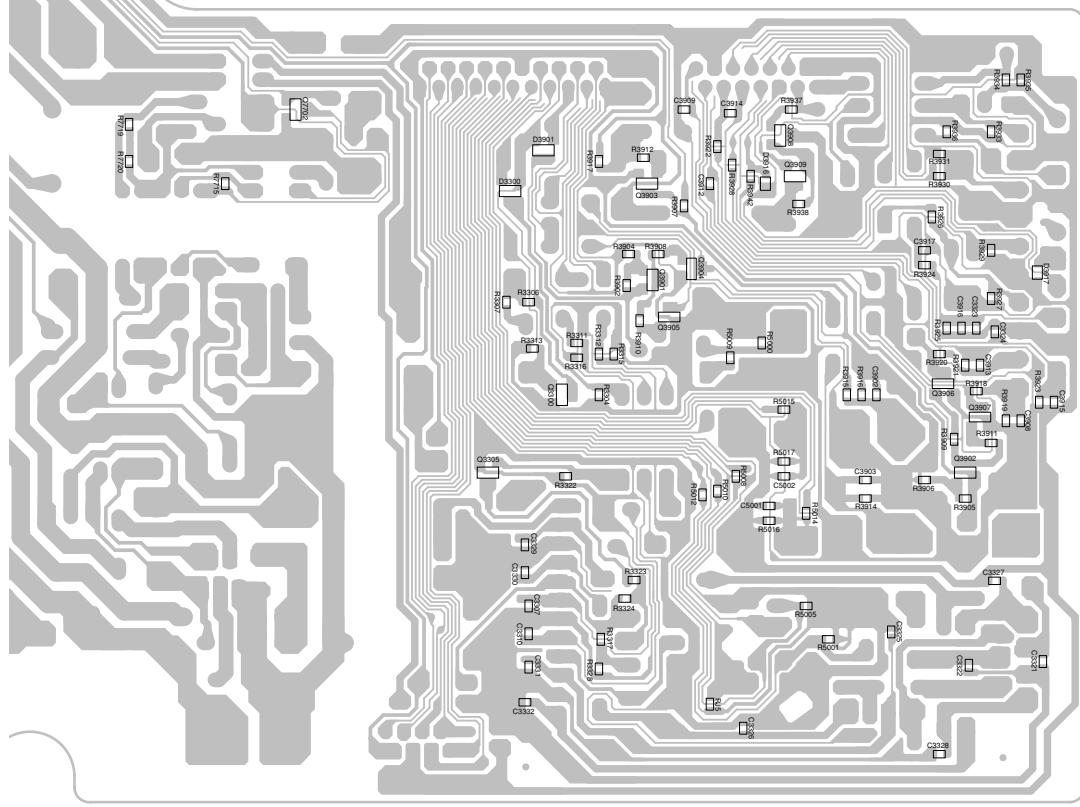


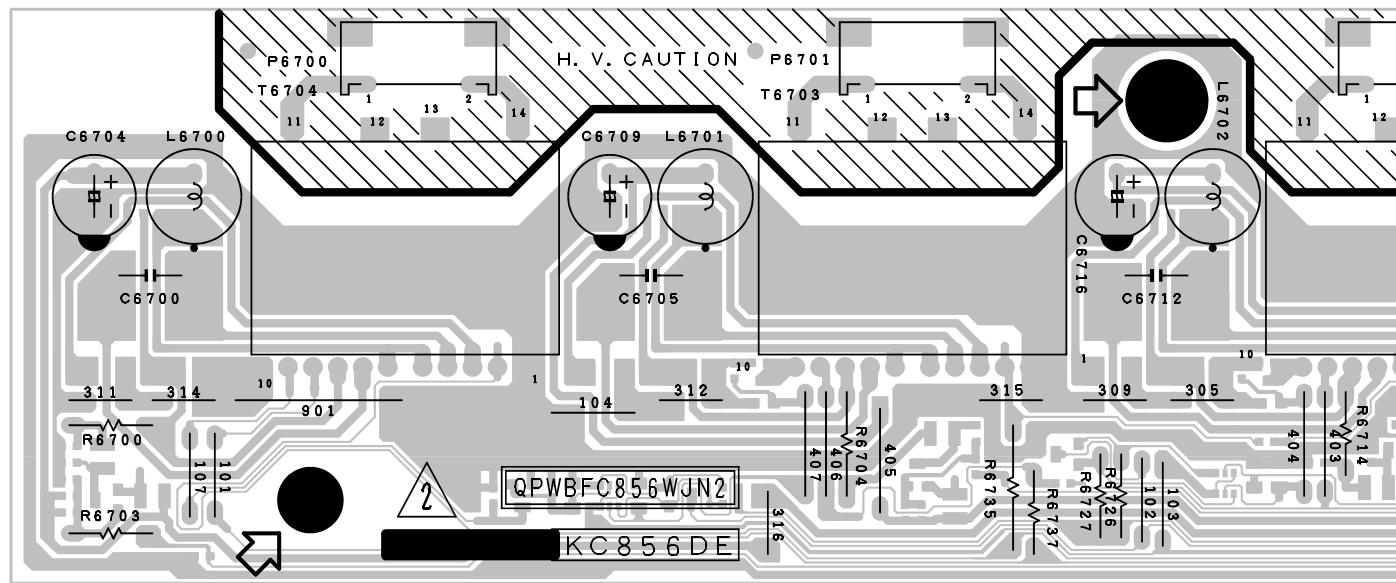
10	11	12	13	14	15	16	17	18	19
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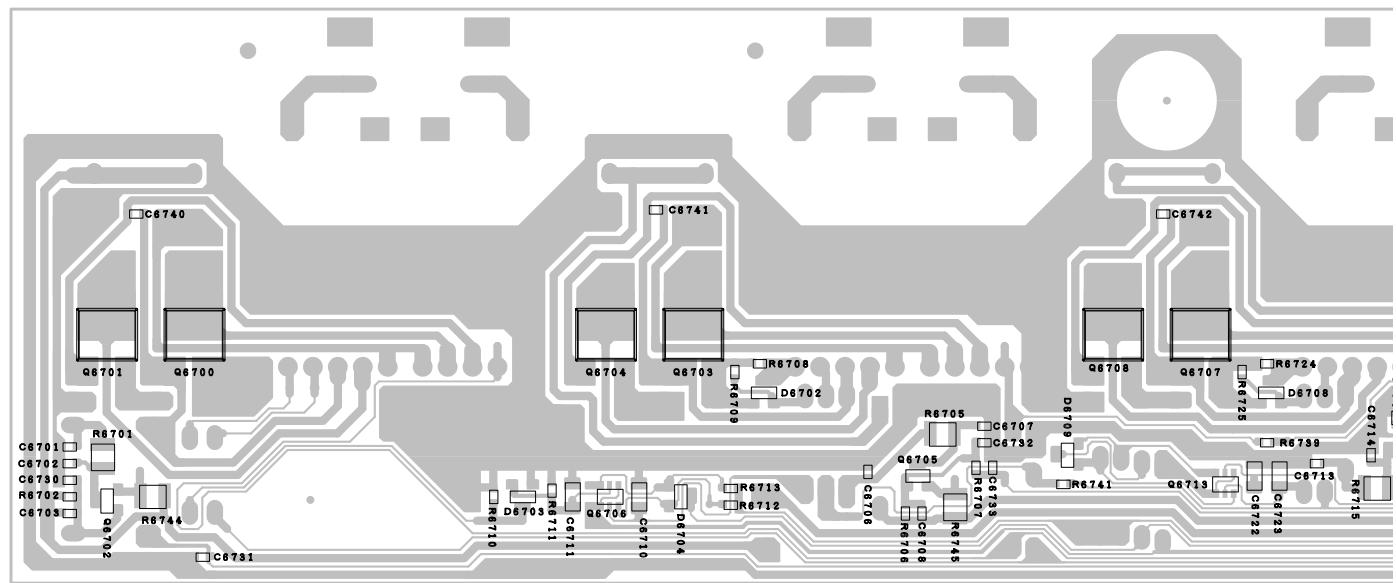


SUB Unit (Chip Parts Side)



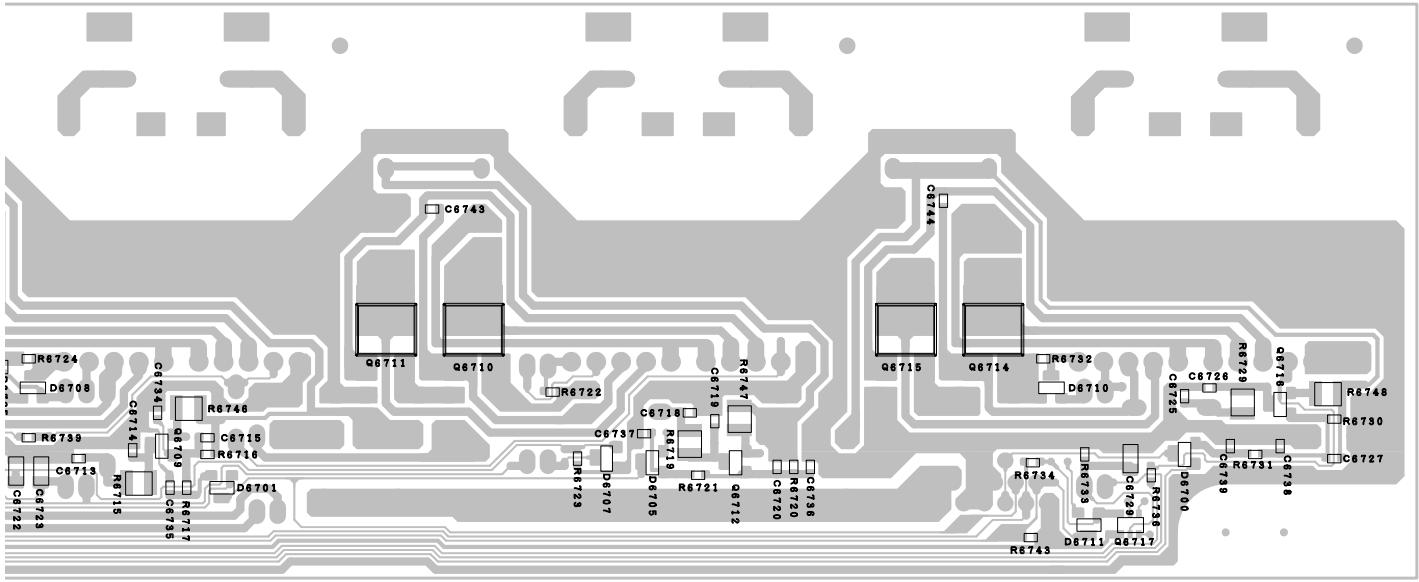
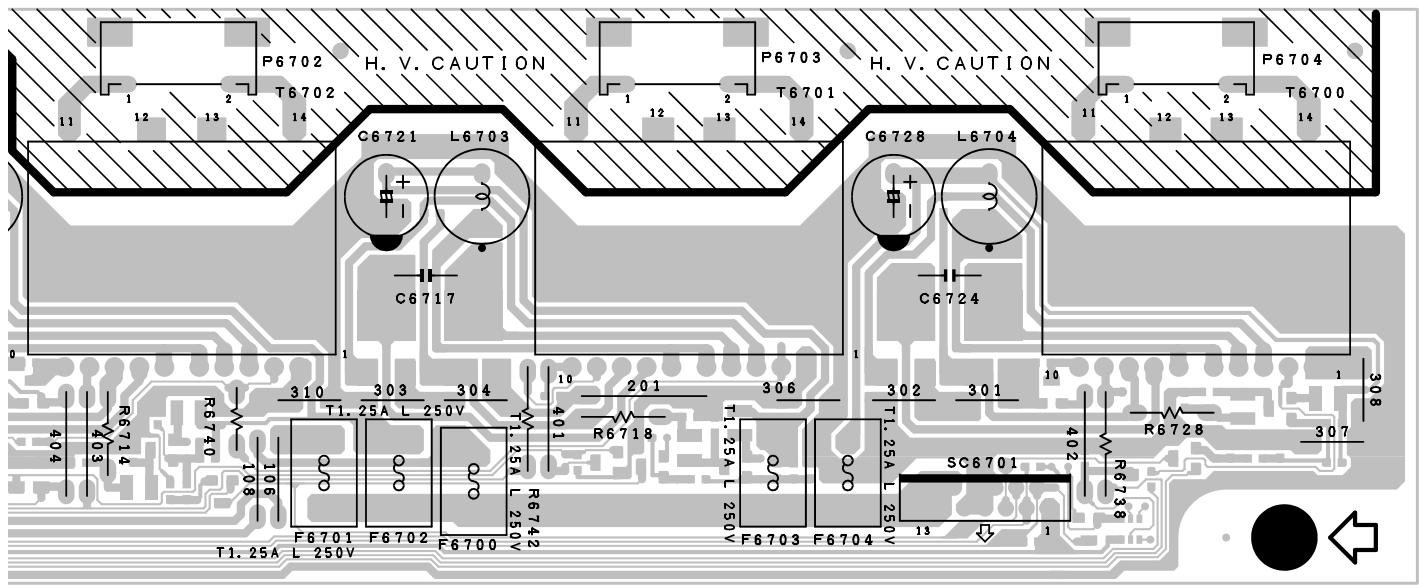


INVERTER Unit (Wiring Side)

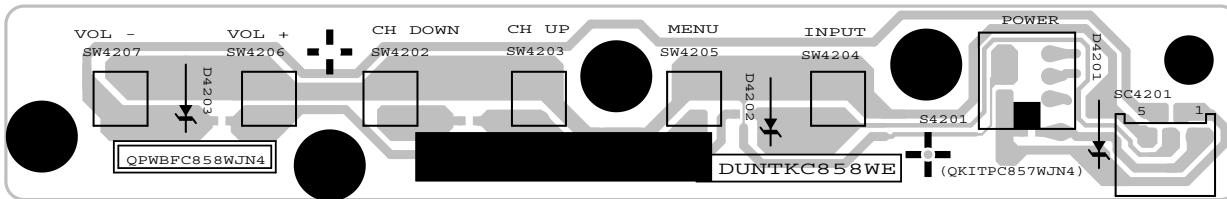


INVERTER Unit (Chip Parts Side)

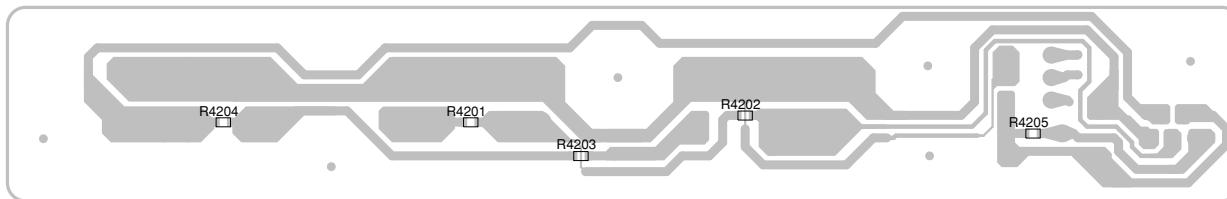
1	2	3	4	5	6	7	8	9	10
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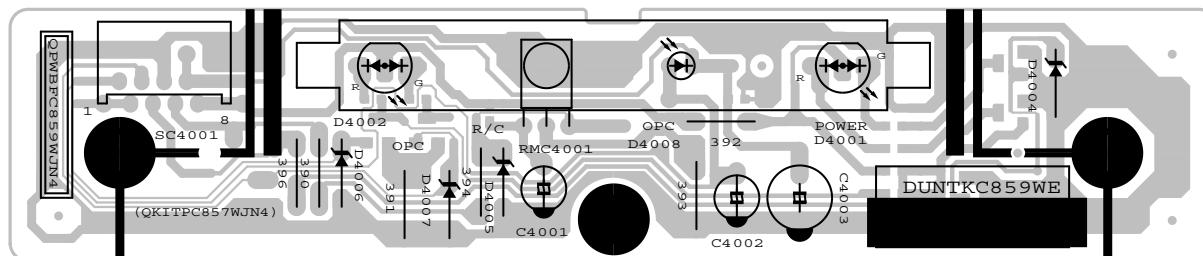
10	11	12	13	14	15	16	17	18	19
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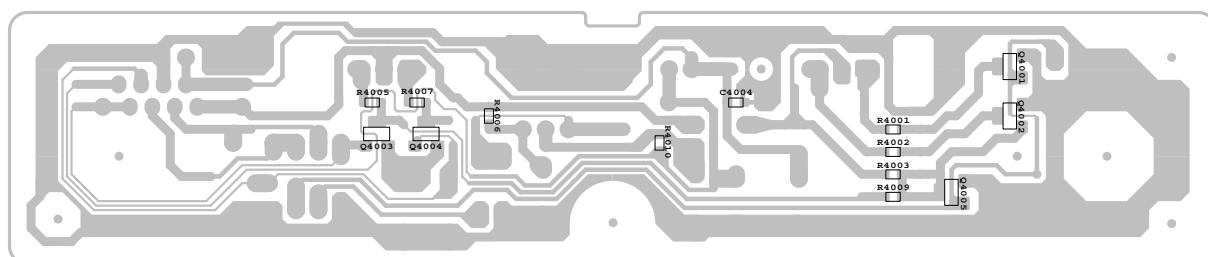
OPERATION Unit (Wiring Side)



OPERATION Unit (Chip Parts Side)



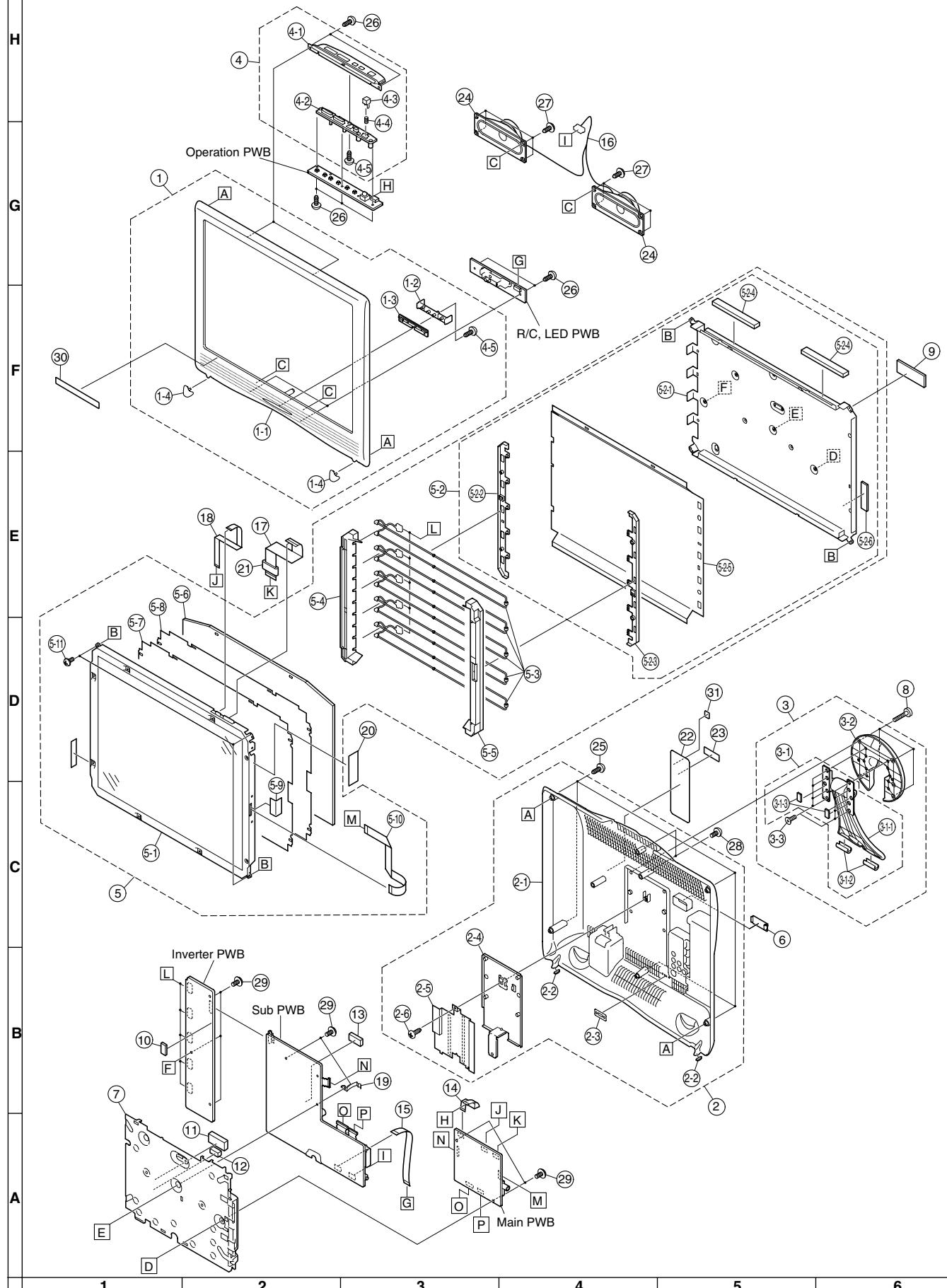
R/C, LED Unit (Wiring Side)



R/C, LED Unit (Chip Parts Side)

Ref. No.	Part No.	★	Description	Code	Ref. No.	Part No.	★	Description	Code					
DUNTC858WE04 OPERATION UNIT														
DIODES														
D4201	RH-EX0646GEZZY	J	Zener Diode	AA	Q4001	VSKRC104S/-1Y	J	KRC104S	AA					
D4202	RH-EX0604GEZZY	J	Zener Diode	AB	Q4002	VSKRC104S/-1Y	J	KRC104S	AA					
D4203	RH-EX0604GEZZY	J	Zener Diode	AB	Q4004	VSKRC104S/-1Y	J	KRC104S	AA					
RESISTORS														
R4201	VRS-CY1JF122JY	J	1.2k 1/16W Metal Oxide	AA	D4001	RH-PXA014WJZZ+	J	STANDBY/ON Indicator	AD					
R4202	VRS-CY1JF471JY	J	470 1/16W Metal Oxide	AA	D4002	RH-PXA014WJZZ+	J	OPC Indicator	AD					
R4203	VRS-CY1JF122JY	J	1.2k 1/16W Metal Oxide	AA	D4004	RH-EX0640GEZZY	J	Zener Diode	AA					
R4204	VRS-CY1JF471JY	J	470 1/16W Metal Oxide	AA	D4005	RH-EX0640GEZZY	J	Zener Diode	AA					
R4205	VRS-CY1JF332JY	J	3.3k 1/16W Metal Oxide	AA	D4007	RH-EX0640GEZZY	J	Zener Diode	AA					
SWITCHES														
S4201	QSW-P0614CEZZ	J	MAIN POWER	AF	D4008	RH-PXA088WJZZ	J	OPC Sensor	AG					
SW4202	QSW-K0003AJZZ+	J	CH(∨)	AB	CAPACITORS									
SW4203	QSW-K0003AJZZ+	J	CH(^)	AB	C4001	VCEAEA1CW106M+	J	10 16V	Electrolytic	AB				
SW4204	QSW-K0003AJZZ+	J	INPUT	AB	C4002	VCEAEA1CW106M+	J	10 16V	Electrolytic	AB				
SW4205	QSW-K0003AJZZ+	J	MENU	AB	C4003	VCEAEA0JW107M+	J	100 6.3V	Electrolytic	AB				
SW4206	QSW-K0003AJZZ+	J	VOL(+)	AB	C4004	VCKYCY1HF103ZY	J	0.01 50V	Ceramic	AA				
SW4207	QSW-K0003AJZZ+	J	VOL(-)	AB	RESISTORS									
MISCELLANEOUS PARTS														
SC4201	QSOCN0596REZZ	J	Socket, 5-pin	AB	R4001	VRS-CY1JF331JY	J	330 1/16W Metal Oxide	AA					
MISCELLANEOUS PARTS														
SC4001	QSOCN0896REZZ	J	Socket, 8-pin		R4002	VRS-CY1JF681JY	J	680 1/16W Metal Oxide	AA					
RM4001	RRMCUA034WJQZ	J	R/C Receiver		R4003	VRS-CY1JF472JY	J	4.7k 1/16W Metal Oxide	AA					
LHLDZA486WJZZ		S	LED Holder		R4006	VRS-CY1JF101JY	J	100 1/16W Metal Oxide	AA					
					R4007	VRS-CY1JF331JY	J	330 1/16W Metal Oxide	AA					
					R4010	VRS-CY1JF333JY	J	33k 1/16W Metal Oxide	AA					
					MISCELLANEOUS PARTS									
					SC4001	QSOCN0896REZZ	J	Socket, 8-pin	AC					
					RM4001	RRMCUA034WJQZ	J	R/C Receiver	AE					
					LHLDZA486WJZZ	S	LED Holder	AD						

CABINET AND MECHANICAL PARTS



1 2 3 4 5 6

Ref. No.	Part No.	★	Description	Code
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SUPPLIED ACCESSORIES

△ X1	QACCBA016WJPZ	J	AC Cord (LC-20SH1E(K))	AR
△ X1	QACCKA006WJPZ	J	AC Cord (LC-20SH1E/E(R)/E(F)/E(I))	AL
X2	RRMCGA339WJSA	S	Wireless Remote Control	AS
X3	TINS-B517WJN2	S	Operation Manual	
X4	TINS-B634WJN2	S	Instruction Book (LC-20SH1E/E(F))	
X5	TINS-B635WJN2	S	Instruction Book (LC-20SH1E)	
X6	TINS-B636WJZZ	S	Instruction Book (LC-20SH1E(R))	
X7	TGAN-1688CEN1	J	Guarantee Card (LC-20SH1E(K))	AN
X8	TGAN-A077WJZZ	J	Guarantee Card (LC-20SH1E(R))	AE
X9	Not Available	-	"AA" size Battery, x2	—

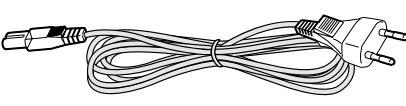
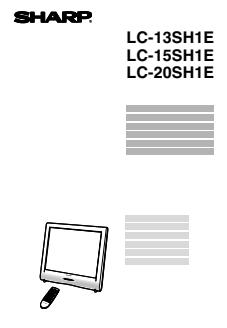
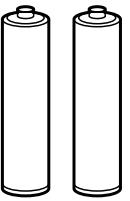
PACKING PARTS (NOT REPLACEMENT ITEM)

S1	SPAKCB640WJZZ	-	Packing Case	—
S2	SPAKPA188WJZZ	-	Wrapping Paper	—
S3	SPAKXA620WJZZ	-	Buffer Material	—
S4	SSAKAA010WJZZ	-	Polyethylene Bag (E(R)/E(K)/E(I)x1, E(F)x2, Ex3)	—
S5	TLABKA002WJZZ	-	Carton Label, x1	—
S6	TLABSA029WJZZ	-	GOST Label (LC-20SH1E(R))	—

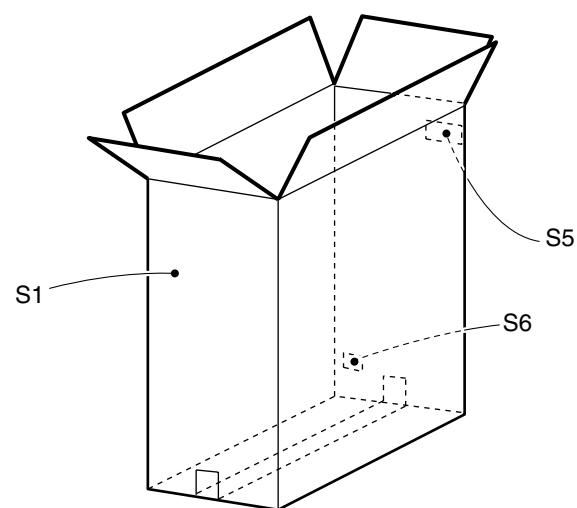
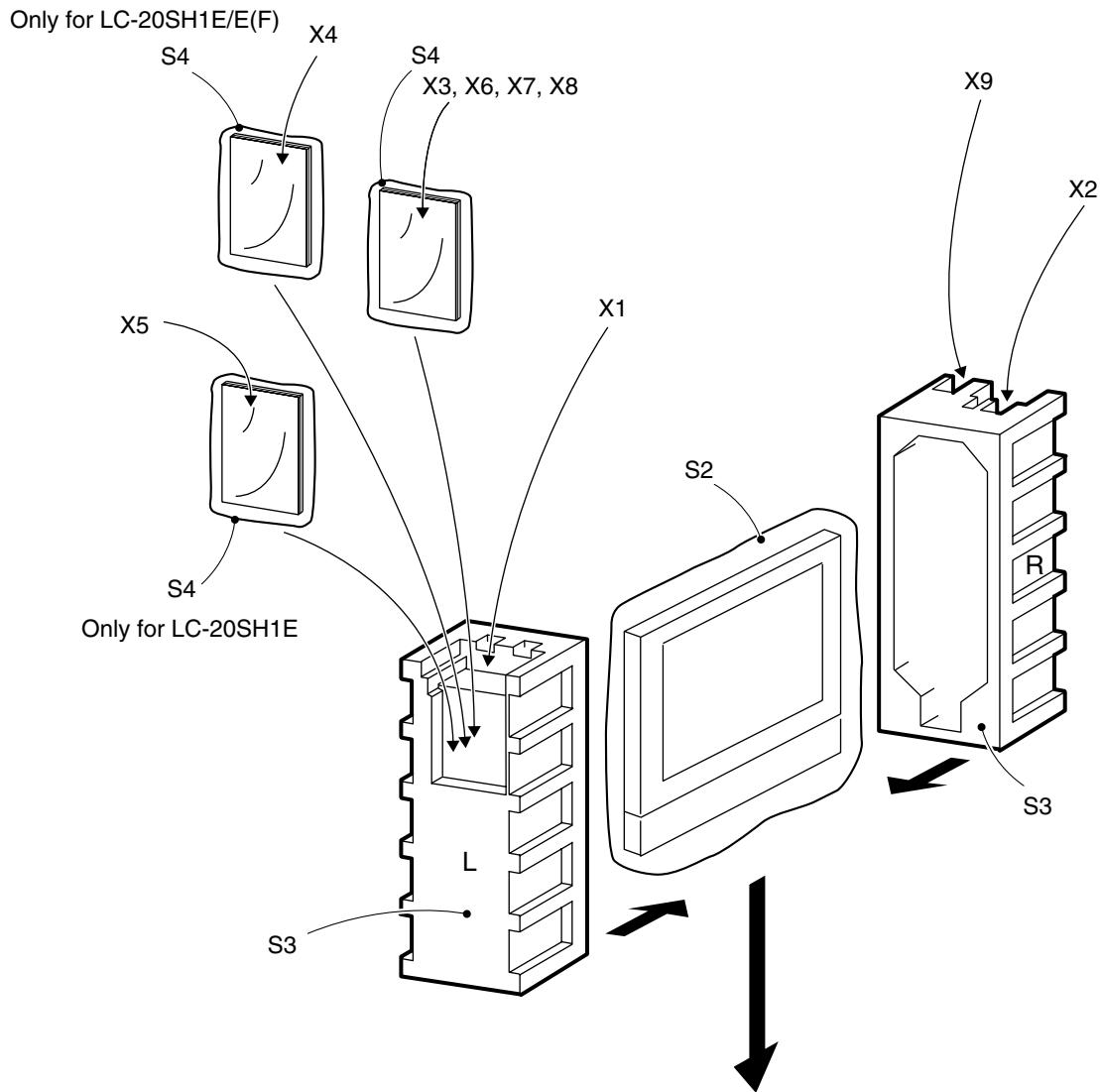
SERVICE JIGS (USE FOR SERVICING)

QCNW-A553WJZZ	J	Extension Cable, 30-pin (SC1203-LCD)	BA
QCNW-A556WJZZ	J	Extension Cable, 50-pin (SC1202-LCD)	AU
QCNW-A555WJZZ	J	Extension Cable, 20-pin (SC1201-LCD)	AU
QCNW-D444WJQZ	J	Extension Cable, 5-pin (SC4201-SC105)	AQ
QCNW-D445WJQZ	J	Extension Cable, 8-pin (SC4001-SC3601)	AQ
JiGINF-001	J	Parallel Part-IIC Interface Jig	CC

Supplied Accessories

AC cord	Wireless remote control	Operation manual	"AA" size batteries (x2)
X1  *Product shape may vary from country to country.	X2 	X3  SHARP LC-13SH1E LC-15SH1E LC-20SH1E	X9 

PACKING OF THE SET



SHARP

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