

# NETWORK RECEIVER

# R-N500

## SERVICE MANUAL

### IMPORTANT NOTICE

This manual has been provided for the use of authorized Yamaha Retailers and their service personnel.

It has been assumed that basic service procedures inherent to the industry, and more specifically Yamaha Products, are already known and understood by the users, and have therefore not been restated.

**WARNING:** Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all Yamaha product owners that any service required should be performed by an authorized Yamaha Retailer or the appointed service representative.

**IMPORTANT:** The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of Yamaha are continually striving to improve Yamaha products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

**WARNING:** Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

**IMPORTANT:** Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

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## ■ TO SERVICE PERSONNEL

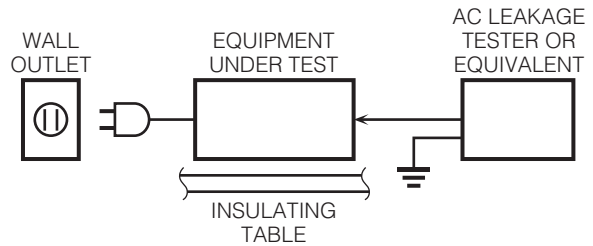
### 1. Critical Components Information

Components having special characteristics are marked  $\Delta$  and must be replaced with parts having specifications equal to those originally installed.

### 2. Leakage Current Measurement (For 120V Models Only)

When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohms shunted by 0.15  $\mu$ F.



- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.



### For U model

#### “CAUTION”

“F5401: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE 8A, 125V FUSE.”

### For C model

#### CAUTION

F5401: REPLACE WITH SAME TYPE 8A, 125V FUSE.

#### ATTENTION

F5401: UTILISER UN FUSIBLE DE RECHANGE DE MÊME TYPE DE 8A, 125V.

## WARNING: CHEMICAL CONTENT NOTICE!

This product contains chemicals known to the State of California to cause cancer, or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

## About lead free solder

All of the P.C.B.s installed in this unit and solder joints are soldered using the lead free solder.

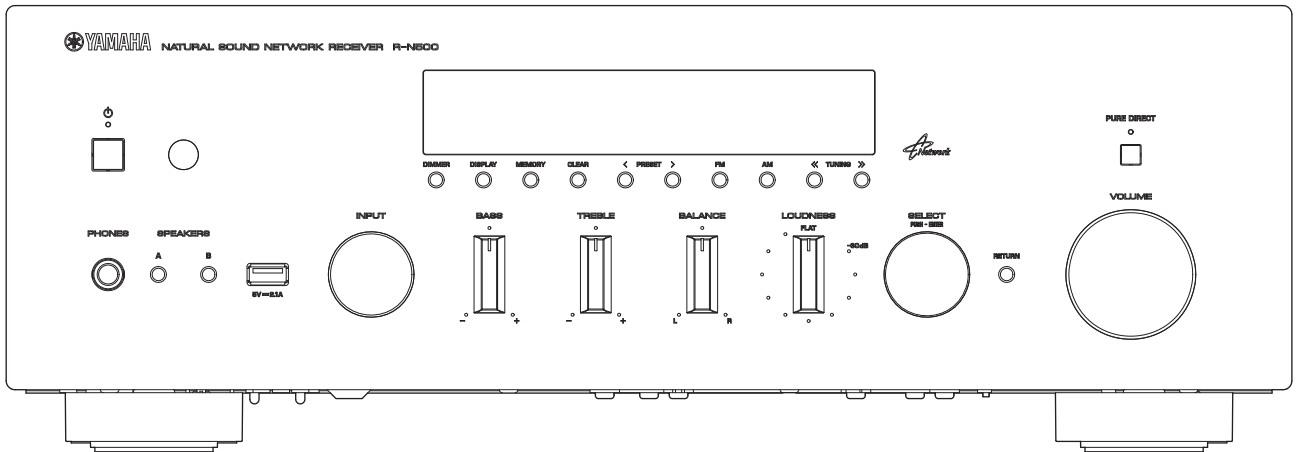
Among some types of lead free solder currently available, it is recommended to use one of the following types for the repair work.

- Sn + Ag + Cu (tin + silver + copper)
- Sn + Cu (tin + copper)
- Sn + Zn + Bi (tin + zinc + bismuth)

### Caution:

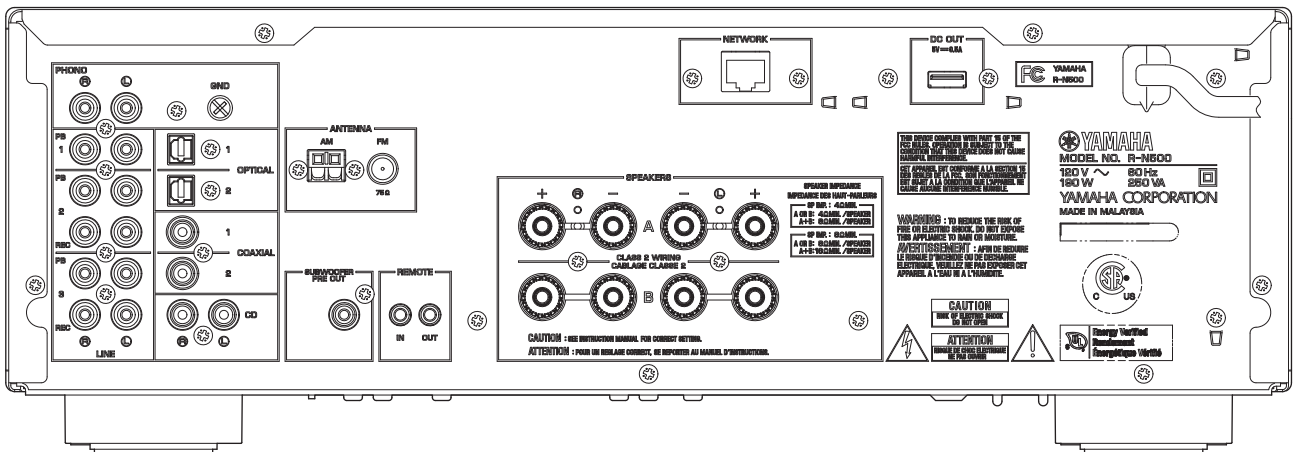
As the melting point temperature of the lead free solder is about 30°C to 40°C (50°F to 70°F) higher than that of the lead solder, be sure to use a soldering iron suitable to each solder.

## FRONT PANEL

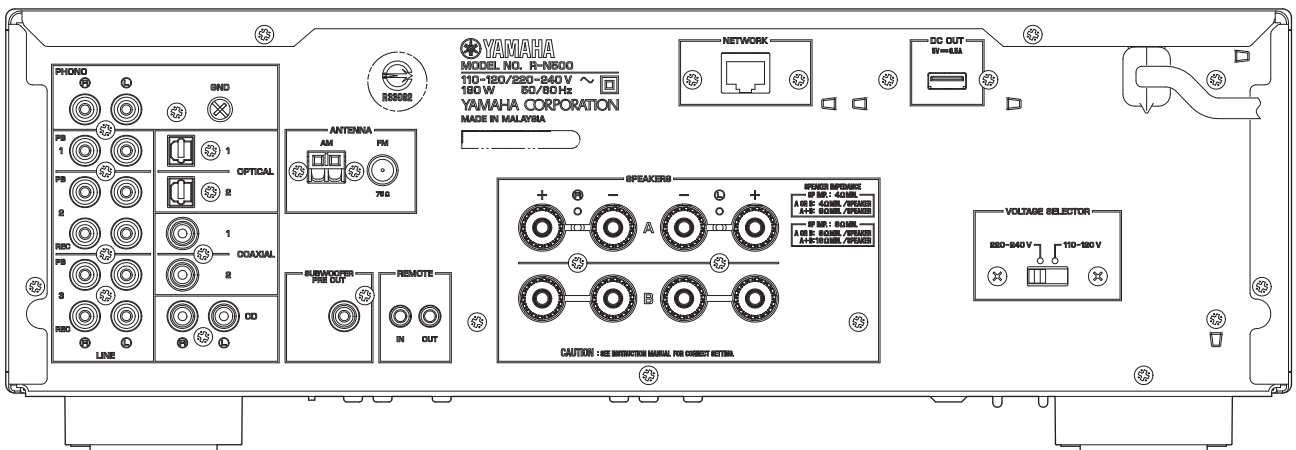


## REAR PANELS

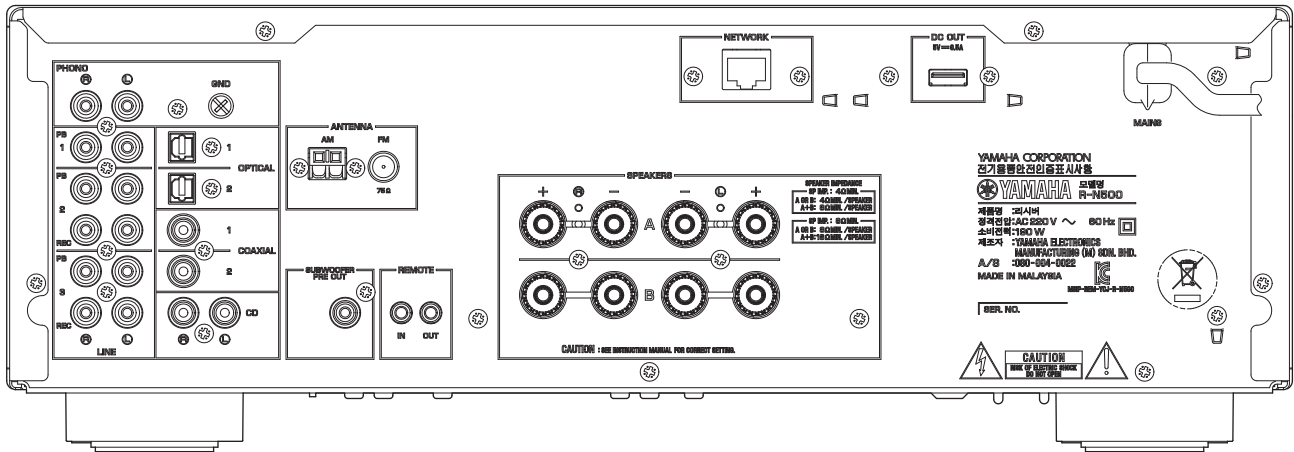
U, C models



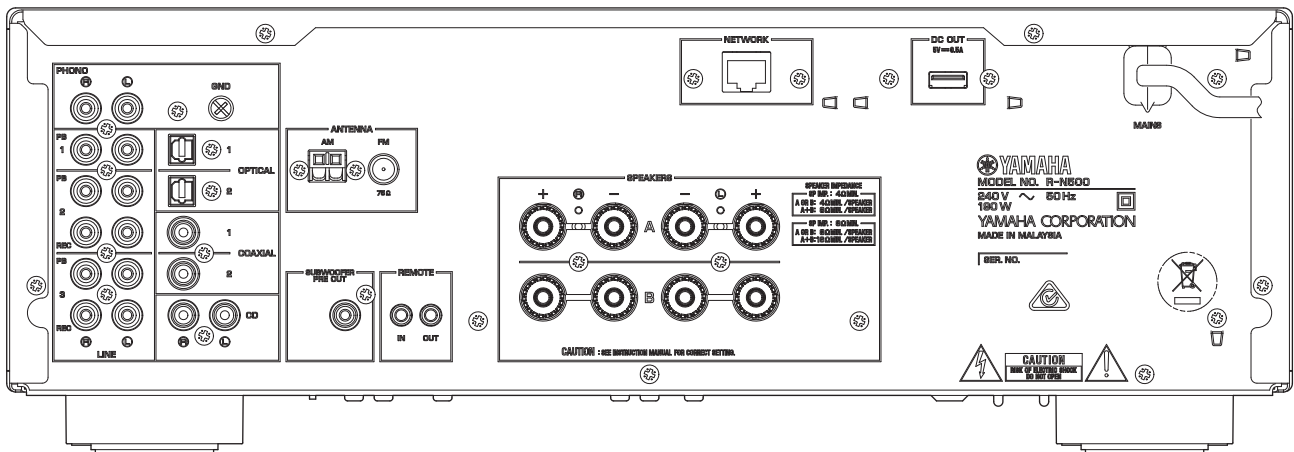
R, S models



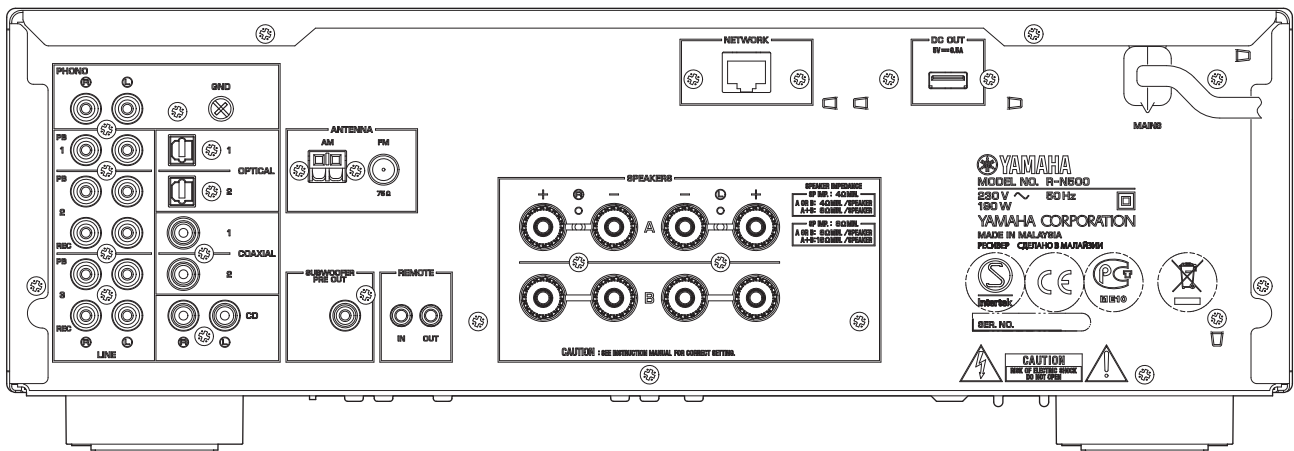
K model



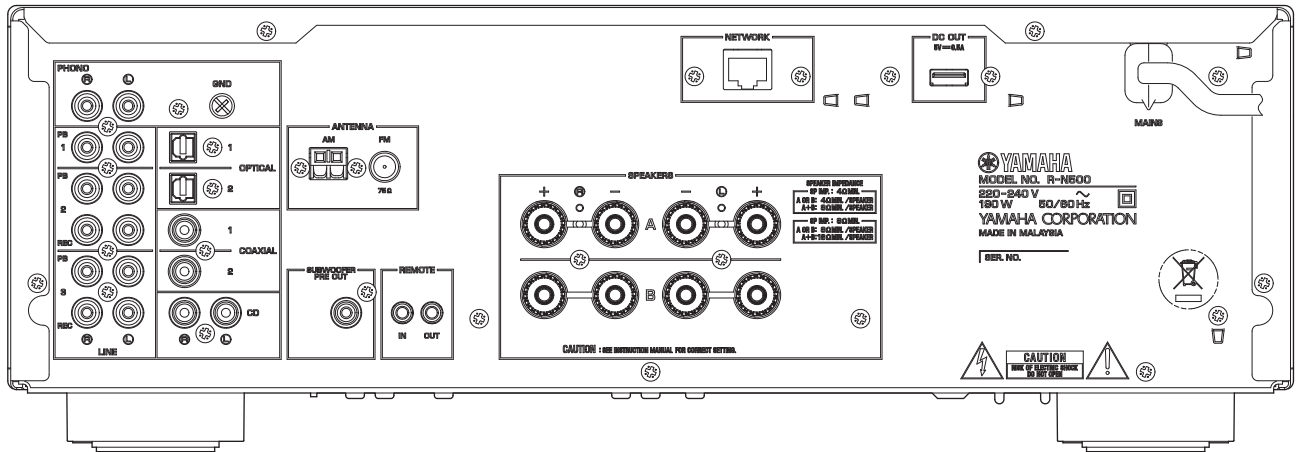
A model



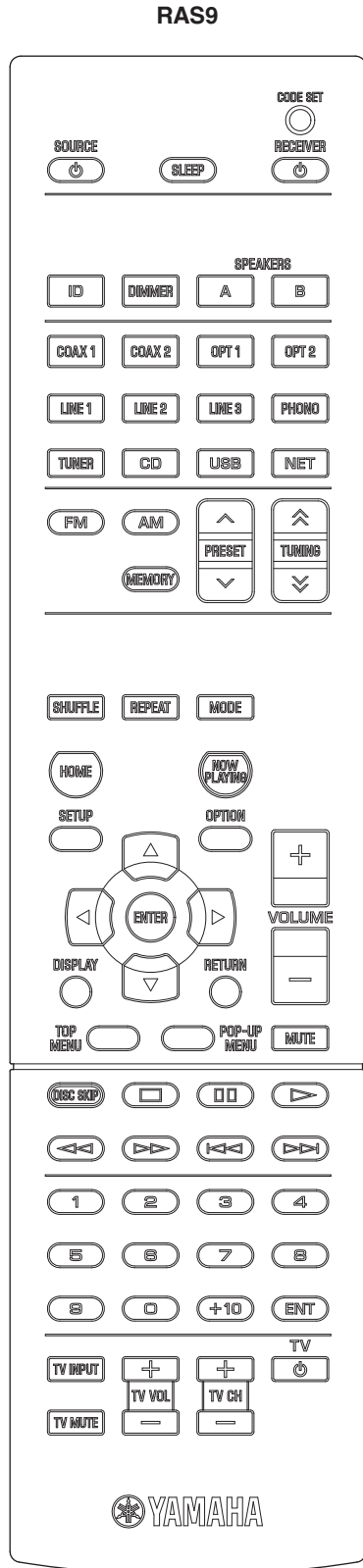
B, G models



L model



## ■ REMOTE CONTROL PANEL



## ■ SPECIFICATIONS

### ■ Audio Section

#### Minimum RMS Output Power (Power Amp. Section)

(20 Hz to 20 kHz, 0.04 % THD, 8 ohms / L/R drive)  
 .....80 W + 80 W

#### Dynamic Power Per Channel (IHF)

8 / 6 / 4 / 2 ohms ..... 105 / 125 / 150 / 178 W

#### Maximum Power Per Channel (1 kHz, 0.7 % THD, 4 ohms)

[G model]  
 ..... 105 W

#### IEC Power (1 kHz, 0.04 % THD, 8 ohms) [G model]

..... 84 W

#### Power Band Width (0.06 % THD, 40 W, 8 ohms / MAIN L/R drive)

..... 10 Hz to 50 kHz

#### Damping Factor (1 kHz, 8 ohms / SPEAKER-A)

..... 150 or more

#### Maximum Effective Output Power (JEITA)

(1 kHz, 10 % THD, 8 ohms) [R, L models]  
 ..... 115 W

#### Input Sensitivity/Input Impedance

PHONO (MM) ..... 3.5 mV / 47 k-ohms  
 CD etc. .... 200 mV / 47 k-ohms

#### Maximum Input Signal (1 kHz)

PHONO (MM) (0.003 % THD) .....60 mV or more  
 CD etc. (0.5 % THD) .....2.2 V or more

#### Output Level/Output Impedance (1 kHz, 200 mV / CD etc. input)

REC OUT ..... 200 mV / 1.0 k-ohms  
 SUBWOOFER OUT ..... 4.0 V / 1.2 k-ohms  
 Cut off frequency ..... 90 Hz  
 Headphone jack (8 ohms load) ..... 410 mV / 470 ohms

#### Frequency Response (CD etc.)

20 Hz to 20 kHz ..... 0 ±0.5 dB  
 10 Hz to 100 kHz (PURE DIRECT ON) ..... 0 ±1.0 dB

#### RIAA Equalization Deviation

PHONO (MM) ..... ±0.5 dB

#### Total Harmonic Distortion (20 Hz to 20 kHz)

PHONO (MM) to REC OUT (3 V) .....0.025 % or less  
 CD etc. to SP OUT (40 W/8 ohms) .....0.015 % or less

#### Signal to Noise Ratio (IHF-A Network)

PHONO (MM), Input shorted 5 mV ..... 87 dB or more  
 CD etc. (PURE DIRECT ON), Input shorted 200 mV  
 ..... 100 dB or more

#### Residual Noise (IHF-A Network)

..... 30 µV

#### Channel Separation (CD etc., input 5.1 k-ohms shorted)

1 kHz ..... 65 dB or more  
 10 kHz ..... 50 dB or more

#### Tone Control Characteristics

Bass  
 Boost/Cut (20 Hz) ..... ±10 dB  
 Turnover frequency .....350 Hz

Treble  
 Boost/Cut (20 kHz) ..... ±10 dB  
 Turnover frequency ..... 3.5 kHz

#### Continuous Loudness Control (Attenuation 1 kHz)

.....-30 dB

R-N500

**Gain Tracking Error** (+16.5 to -80 dB)  
 ..... 0.5 dB or less

**Optical Jack, Coaxial Jack Support Frequencies**  
 ..... 32 kHz to 192 kHz

■ **FM Section**

**Tuning Range**  
 U, C models ..... 87.5 to 107.9 MHz  
 R, L, S models ..... 87.5 to 108.0 / 87.50 to 108.00 MHz  
 K, A, B, G models ..... 87.50 to 108.00 MHz

**50 dB Quieting Sensitivity** (IHF) (1 kHz, 100 % MOD.)  
 Mono ..... 3 µV (20.8 dBf)

**Signal to Noise Ratio** (IHF)  
 Mono / Stereo ..... 71 dB / 69 dB

**Harmonic Distortion** (1 kHz)  
 Mono / Stereo ..... 0.3 % / 0.5 %

**Antenna Input**  
 ..... 75 ohms unbalanced

■ **AM Section**

**Tuning Range**  
 U, C models ..... 530 to 1,710 kHz  
 R, L, S models ..... 530 to 1,710 / 531 to 1,611 kHz  
 K, A, B, G models ..... 531 to 1,611 kHz

**Antenna**  
 ..... Loop antenna

■ **General**

**Power Supply**  
 U, C models ..... AC 120 V, 60 Hz  
 R, S models ..... AC 110-120/220-240 V, 50/60 Hz  
 K model ..... AC 220 V, 60 Hz  
 A model ..... AC 240 V, 50 Hz  
 B, G models ..... AC 230 V, 50 Hz  
 L model ..... AC 220-240 V, 50/60 Hz

**Power Consumption**  
 ..... 190 W

**Standby Power Consumption** (reference data)  
 ..... 0.1 W or less

**Network Standby On**  
 ..... 2.0 W (typical)

**Maximum Power Consumption** [R model]  
 ..... 380 W

**Dimensions (W x H x D)**  
 ..... 435 x 151 x 387 mm (17-1/8" x 5-7/8" x 15-1/4")

**Weight**  
 ..... 9.8 kg (21.6 lbs.)

**Finish**  
 U, C, R, A, B, G, L, S models ..... Black color  
 U, C, R, K, A, B, G, L, S models ..... Silver color

**Accessories**  
 Remote control ..... x 1  
 Battery (R03, AAA, UM-4) ..... x 2  
 FM antenna (1.4 m) ..... x 1  
 AM antenna (1.2 m) ..... x 1

\* **Specifications are subject to change without notice.**

<b>U</b> ..... <b>U.S.A. model</b>	<b>B</b> ..... <b>British model</b>
<b>C</b> ..... <b>Canadian model</b>	<b>G</b> ..... <b>European model</b>
<b>R</b> ..... <b>General model</b>	<b>L</b> ..... <b>Singapore model</b>
<b>K</b> ..... <b>Korean model</b>	<b>S</b> ..... <b>Brazilian model</b>
<b>A</b> ..... <b>Australian model</b>	



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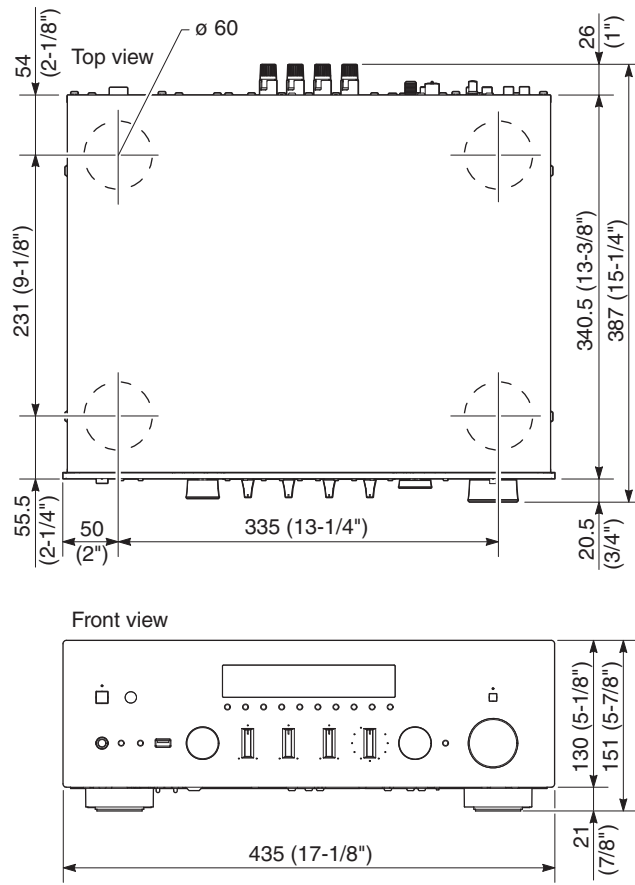
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 Android is a trademark of Google Inc.



This receiver supports network connections.

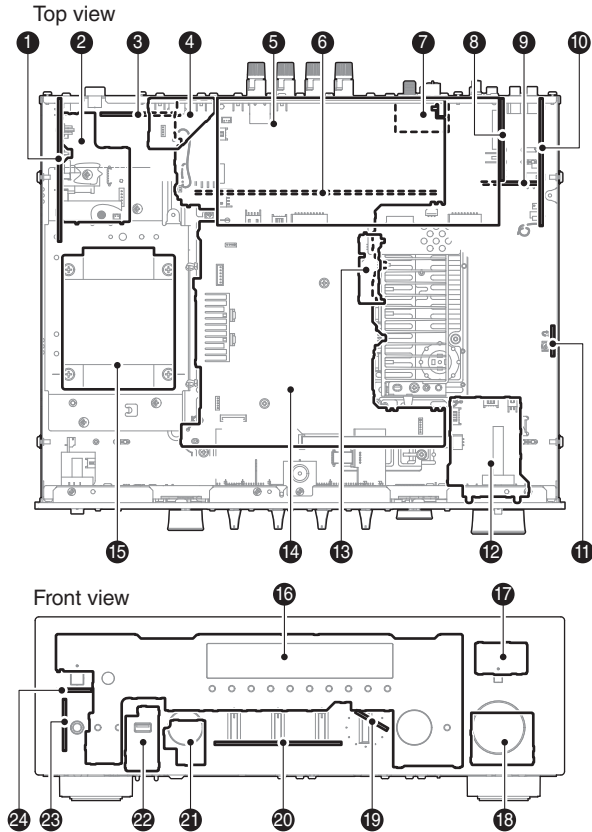
• DIMENSIONS



Unit: mm (inch)



## INTERNAL VIEW



- ① OPERATION (2) P.C.B.
- ② MAIN (3) P.C.B.
- ③ MAIN (4) P.C.B. (R, S models)
- ④ MAIN (9) P.C.B.
- ⑤ DIGITAL P.C.B.
- ⑥ MAIN (2) P.C.B.
- ⑦ AM/FM TUNER
- ⑧ OPERATION (3) P.C.B.
- ⑨ OPERATION (5) P.C.B.
- ⑩ OPERATION (4) P.C.B.
- ⑪ MAIN (10) P.C.B.
- ⑫ OPERATION (6) P.C.B.
- ⑬ MAIN (6) P.C.B.
- ⑭ MAIN (1) P.C.B.
- ⑮ POWER TRANSFORMER
- ⑯ OPERATION (1) P.C.B.
- ⑰ MAIN (8) P.C.B.
- ⑱ MAIN (7) P.C.B.
- ⑲ OPERATION (8) P.C.B.
- ⑳ OPERATION (7) P.C.B.
- ㉑ OPERATION (9) P.C.B.
- ㉒ OPERATION (11) P.C.B.
- ㉓ OPERATION (10) P.C.B.
- ㉔ MAIN (5) P.C.B.

## SERVICE PRECAUTIONS

### Safety measures

- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there. Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity. The time required for discharging is about 30 seconds per each.

C2044 and C2045 on MAIN (1) P.C.B.

C5407 on OPERATION (2) P.C.B.

For details, refer to "PRINTED CIRCUIT BOARDS".

## ■ DISASSEMBLY PROCEDURES

(Remove parts in the order as numbered.)

Disconnect the power cable from the AC outlet.

### 1. Removal of Top Cover

- a. Remove 4 screws (①), 4 screws (②) and screw (③). (Fig. 1)
- b. Remove the top cover. (Fig. 1)

### 2. Removal of Front Panel Unit

- a. Remove screw (④) and then remove the support top. (Fig. 1)
- b. Remove the knobs and caps. (Fig. 1)
- c. Remove 7 screws (⑤). (Fig. 1)
- d. Remove the front panel unit. (Fig. 1)

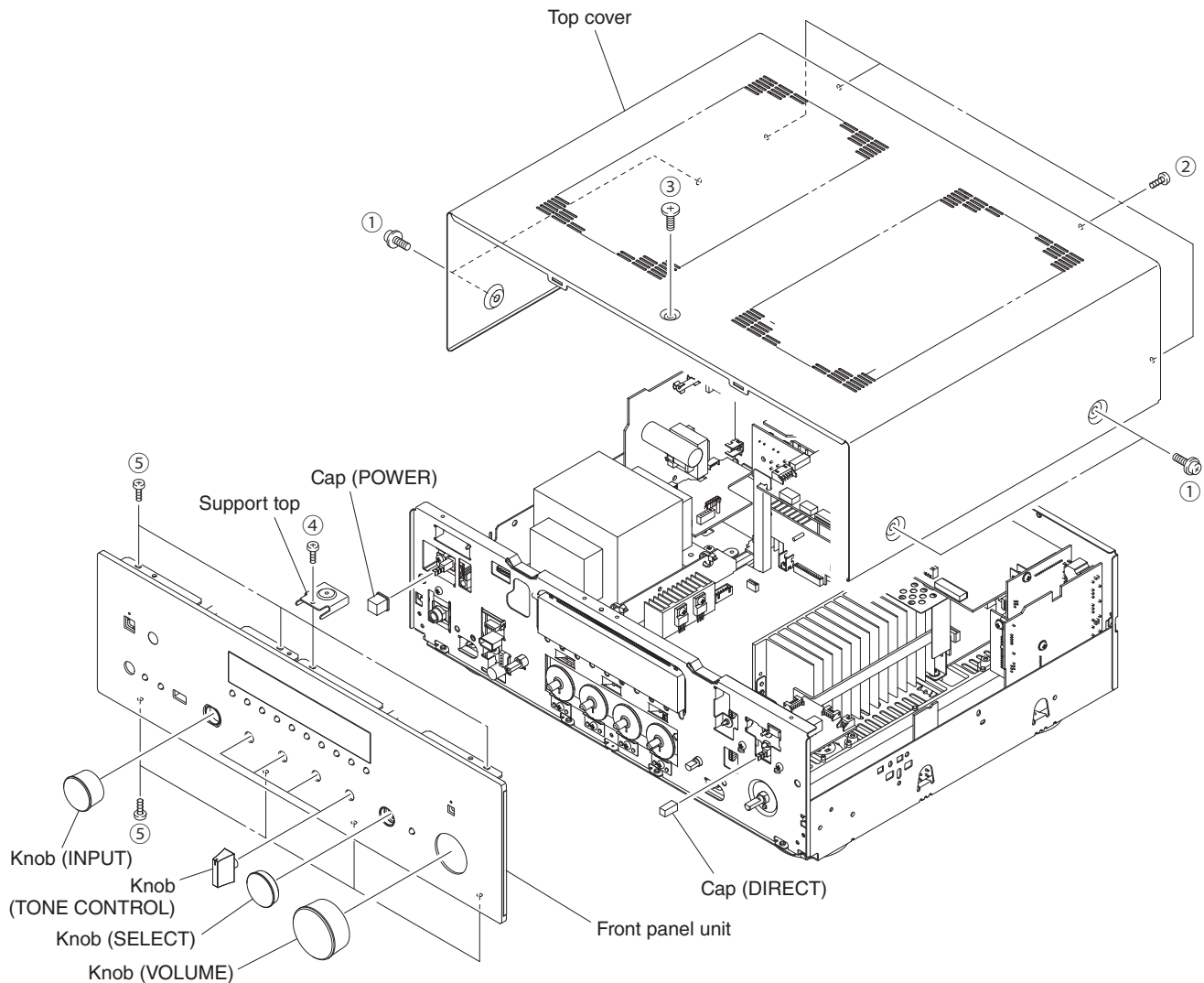


Fig. 1

**3. Removal of Sub-chassis Unit**

- a. Remove 2 screws (⑥). (Fig. 2)
- b. Remove CB21, CB61, CB426, CB461, CB463 and CB952. (Fig. 2)
- c. Unlock and remove CB205. (Fig. 1)
- d. Remove the sub-chassis unit. (Fig. 2)

**4. Removal of DIGITAL P.C.B.**

- a. Remove screw (⑦) and then remove the support. (Fig. 2)
- b. Remove 2 screws (⑧) and 9 screws (⑨). (Fig. 3)
- c. Remove CB23, CB30, CB64 and CB65. (Fig. 2)
- d. Unlock and remove CB24 and CB25. (Fig. 1)
- e. Remove the DIGITAL P.C.B. together with the OPERATION (3)–(5) P.C.B.s. (Fig. 2)

**5. Removal of Amp Unit and Power Transformer**

- a. Remove 2 screws (⑩) and screw (⑪). (Fig. 2)
- b. Remove 2 screws (⑫). (Fig. 3)
- c. Remove push rivet and then remove the amp unit. (Fig. 2)
- d. Remove 4 screws (⑬). (Fig. 2)
- e. Remove the power transformer. (Fig. 2)

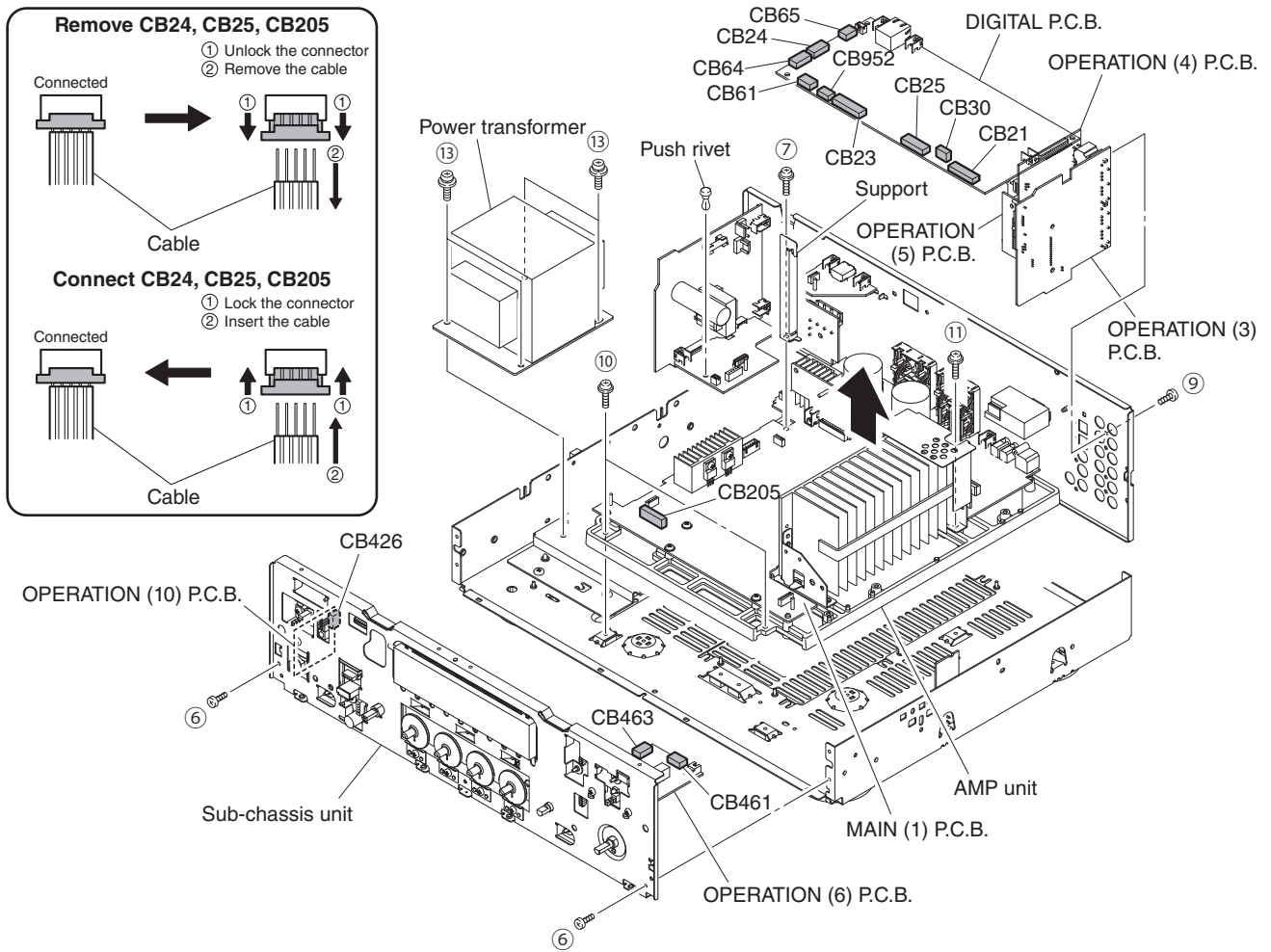


Fig. 2

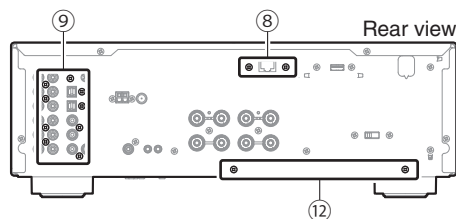
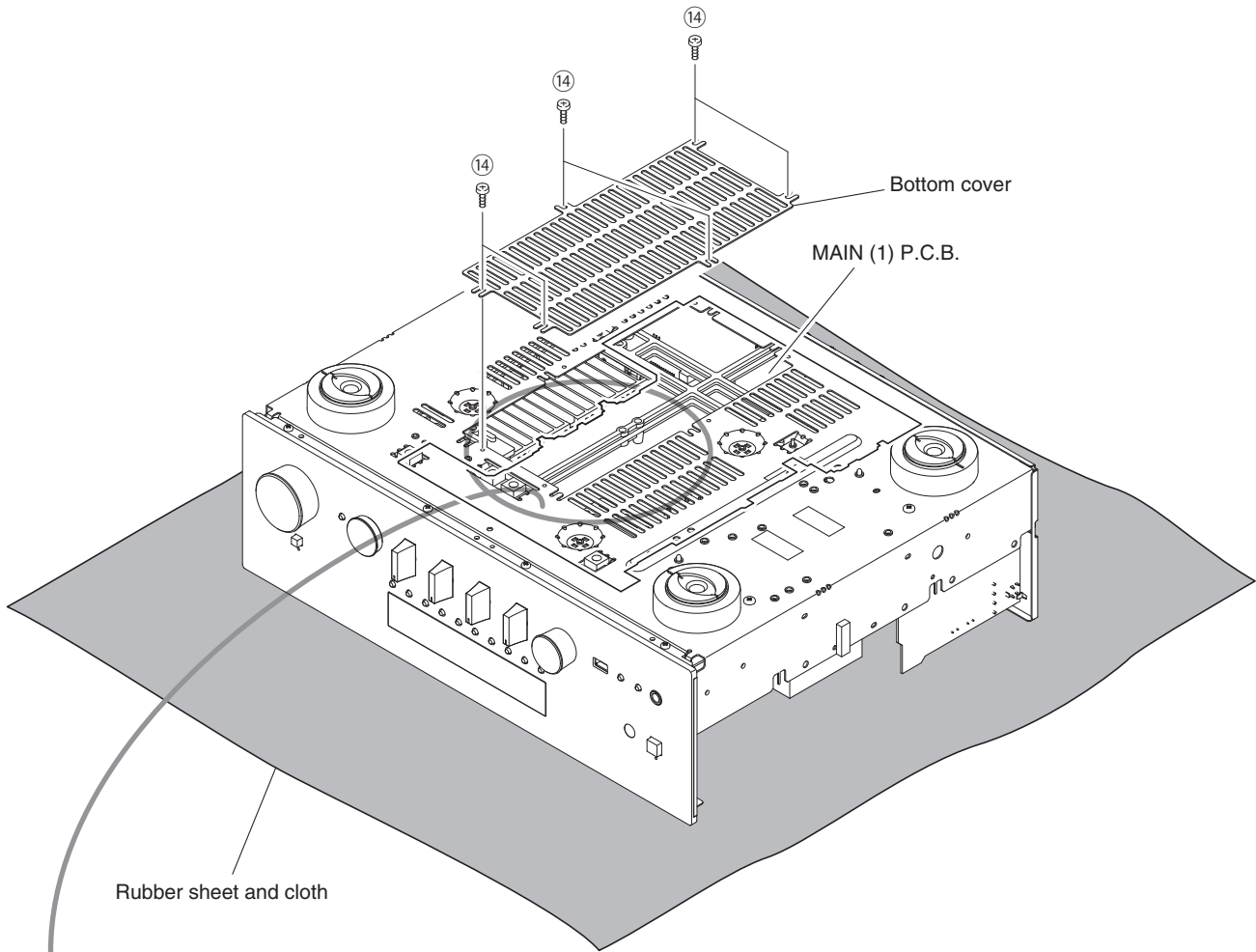


Fig. 3

**When checking the MAIN (1) P.C.B.:**

- Spread the rubber sheet and the cloth. Then place this unit on the cloth upside down. (Fig. 5)
- Remove 6 screws (14) and then remove the bottom cover. (Fig. 5)



Power transistor of MAIN (1) P.C.B. and its periphery

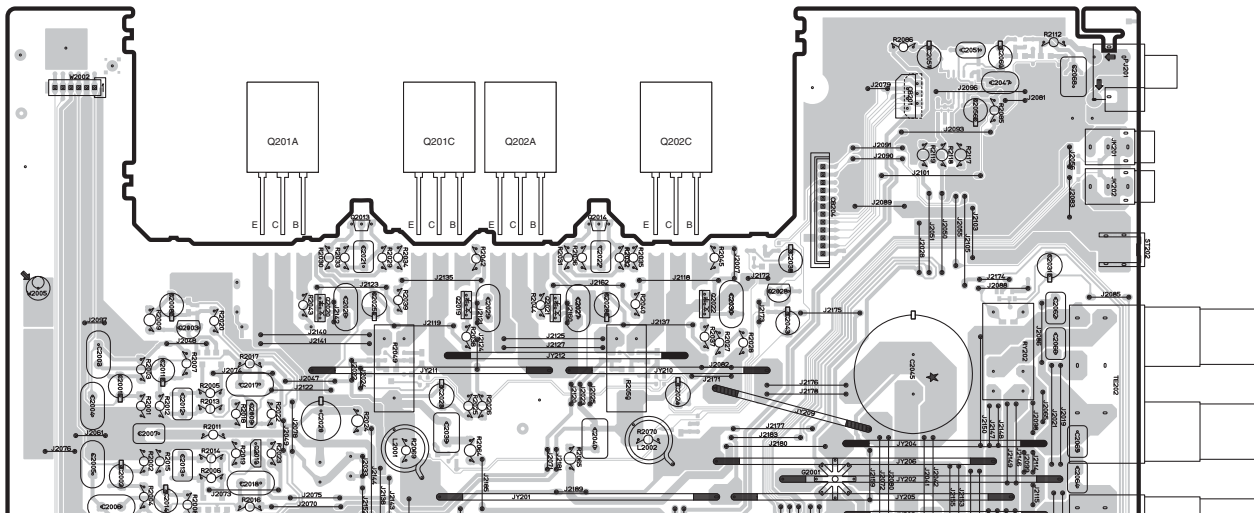


Fig. 5

## ■ UPDATING FIRMWARE

When the following parts are replaced, the firmware must be updated to the latest version.

DIGITAL P.C.B.

### ● Confirmation of firmware version

Before and after updating the firmware, check the firmware version by using the self-diagnostic function menu.

Start up the self-diagnostic function and select “S2. ROM VERSION/CHECKSUM” menu.

Using the sub-menu, have the firmware version displayed, and note them down.

(For details, refer to “SELF-DIAGNOSTIC FUNCTION”)

- \* When the firmware version is different from written one after updating, perform the updating procedure again from the beginning.

### ● Initializing the back-up IC (EEPROM: IC22 on DIGITAL P.C.B.)

After updating the firmware, the back-up IC MUST be initialized by the following procedure store the setting information (soundfield parameters, system memory and tuner presetting, etc.) properly.

Start up the self-diagnostic function and select “S1. FACTORY PRESET” menu.

(For details, refer to “SELF-DIAGNOSTIC FUNCTION”)

Select “PRESET RSRV”, press the “⏻” (Power) key to turn off the power once and turn on the power again. Then the back-up IC is initialized.

### ● Required Tools

- USB storage device
- Firmware  
R0346-xxxx.bin

### ● Preparation

1. Download the latest firmware from the specified download source to the folder of the PC.
2. Copy the latest firmware from the PC to the root folder of the USB storage device.

Note: When the latest firmware is copied to a sub-folder of the USB storage device, the update will not proceed.

## ● Operation Procedures

- \* Disconnect the power cable of this unit from the AC outlet.
- 1. Press the “ $\phi$ ” (Power) key to the ON position. (Fig. 1)
- 2. Insert the USB storage device to the USB jack. (Fig. 1)
- 3. While pressing the “DIMMER” key, connect the power cable to the AC outlet. (Fig. 1)

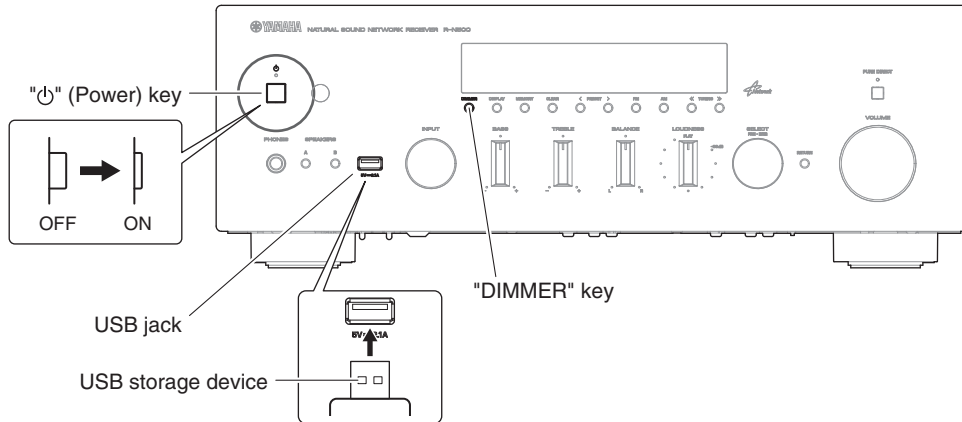


Fig. 1

- 4. The USB UPDATE mode is activated and “USB UPDATE” is displayed. Writing of the firmware starts automatically. (Fig. 2)

Writing is started.

Writing being executed.

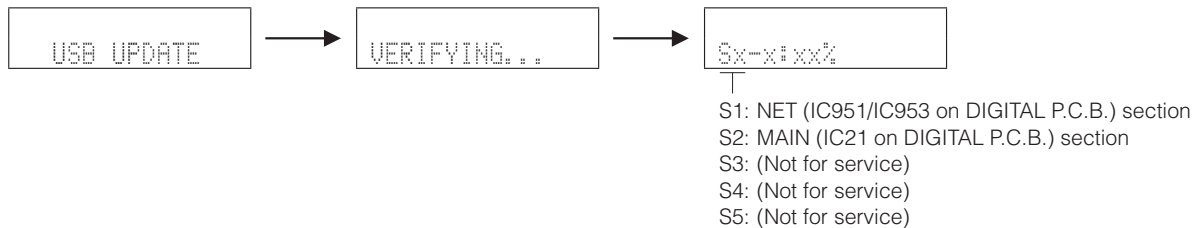


Fig. 2

- \* If “ERROR! xxxx” is displayed during writing of the firmware, refer to “List of Error Messages” to determine the cause and perform the updating procedure again from the beginning.

- 5. When writing of the firmware is completed, “UPDATE SUCCESS”, “PLEASE...” and “POWER OFF!” are displayed repeatedly. (Fig. 3)

Writing is completed.

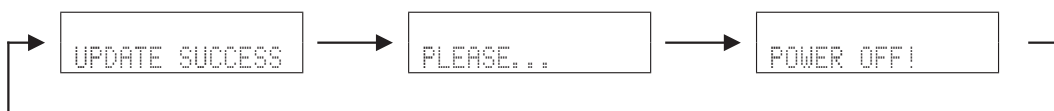


Fig. 3

- 6. Press the “ $\phi$ ” (Power) key to turn off the power. (Fig. 1)
- 7. Remove the USB storage device from the USB jack. (Fig. 1)
- 8. Start up the self-diagnostic function and check that the firmware version and checksum are the same as written ones. (For details, refer to “Confirmation of firmware version and checksum”)

## List of Error Messages

Display

Error number

Error Number	Error Message	Cause
0001	Microprocessor clearing error	Microprocessor failure
0002	Microprocessor writing error	
0004	Microprocessor checksum error	Microprocessor failure / Mismatch of checksum
0008	DSP1 status port error	DSP1 failure / Malfunction of communication with microprocessor  (Not for service)
0010	DSP1 checksum error	
0020	DSP1 data reception time out	
0040	DSP1 checksum calculation time out	
0080	DSP2 status port error	DSP2 failure / Malfunction of communication with microprocessor  (Not for service)
0100	DSP2 checksum error	
0200	DSP2 data reception time out	
0400	DSP2 checksum calculation time out	
0800	OSD Flash ROM clearing error	OSD Flash ROM failure / Malfunction of communication with microprocessor
1000	OSD Flash ROM writing error	
2000	OSD Flash ROM checksum error	(Not for service)
4000	Destination judging error	No destination is written on EEPROM.

\* The error number is displayed in the 4-digit hexadecimal notation.

\* The error numbers are added when a multiple number of errors occur at the same time.

Example If errors by the error number "0002" and "0008" occur at the same time, the error number will be displayed as "000A"

## ■ SELF-DIAGNOSTIC FUNCTION

This unit has self-diagnostic functions that are intended for inspection, measurement and location of faulty point.

There are 14 main menu items, each of which has sub-menu items.

Listed in the table below are main menu items and sub-menu items.

**Note:** Some of the menu items listed below may not apply to the models covered in this service manual.

No.	Main menu	No.	Sub-menu
<b>A: Audio system</b>			
A1	AUDIO SET	1	NORMAL
		2	PRE MUTE
		3	VOL MUTE
		4	AC B : HIGH (Not for service)
		5	AC B : LOW (Not for service)
A2	DIR PLL	1	DIR PLL
<b>D: Display system</b>			
D1	FL CHECK	1	INITIAL DISPLAY
		2	ALL SEGMENT OFF
		3	ALL SEGMENT ON
		4	CHECK PATTERN 1
		5	CHECK PATTERN 2
<b>U: Universal system</b>			
U1	USB	1	USB FRONT 1 TRACK
		2	USB_VBUS HIGH POWER (Not for service)
<b>N: Network system</b>			
N1	NETWORK	1	IP ADDRESS CHECK
		2	MAC ADDRESS CHECK
		3	LINE NOISE 100 MDI (Not for service)
		4	LINE NOISE 100 MDIX (Not for service)
		5	LINE NOISE 10 MDI (Not for service)
		6	LINE NOISE 10 MDIX (Not for service)
		7	LINK CHECK
		8	EXT TEST
<b>C: Communication system</b>			
C1	ACCESS CHECK	1	ALL
		2	BUS DIR
		3	EEPROM
		4	TUNER
C2	NETWORK IC CHECK	1	ALL
		2	NET RAM
		3	PHY TEST
		4	APL ID
<b>P: Power supply and protection system</b>			
P1	AD DATA CHECK	1	DC
		2	PS
		3	TMP
		4	OUTPUT LEVEL
		5	LIMITER CONTROL
		6	USB-VBUS
		7	KEY

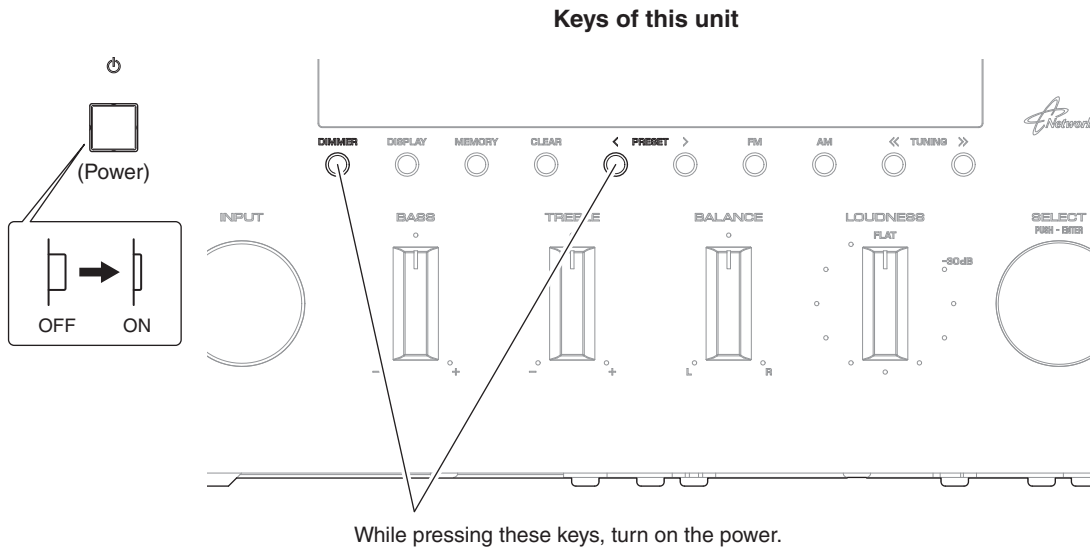


No.	Main menu	No.	Sub-menu
P2	PROTECTION HISTORY	1	1. HISTORY 1
		2	1. POWER PORT
		3	1. LAST INPUT
		4	1. LAST VOLUME LEVEL
		5	2. HISTORY 2
		6	2. POWER PORT
		7	2. LAST INPUT
		8	2. LAST VOLUME LEVEL
		9	3. HISTORY 3
		10	3. POWER PORT
		11	3. LAST INPUT
		12	3. LAST VOLUME LEVEL
		13	4. HISTORY 4
		14	4. POWER PORT
		15	4. LAST INPUT
		16	4. LAST VOLUME LEVEL
<b>T: Troubleshooting Information</b>			
T1	TROUBLE SHOOTING INFORMATION	1	OPERATING TIME
		2	POWER-RELAY ON
		3	POWER AMP B
		4	OUTPUT LEVEL
		5	NRC (Net Restart Counter) (Not for service)
<b>S: System and version system</b>			
S1	FACTORY PRESET	1	PRESET INHIBIT
		2	PRESET RESERVED
S2	ROM VERSION/CHECKSUM	1	SYSTEM VERSION
		2	MICROPROCESSOR VERSION
		3	MICROPROCESSOR CHECKSUM
		4	NETWORK VERSION
		5	NETWORK CHECKSUM
S3	SOFT SWITCH (Not for service)	1	SWITCH MODE
S4	SYSTEM INFORMATION	1	MODEL/DESTINATION
		2	VERIFY (Not for service)

## ● Starting Self-Diagnostic Function

While pressing the “PRESET <” and “DIMMER” keys, press the “⏻” (Power) key to turn on the power, and release those 2 keys.

The self-diagnostic function mode is activated.



## ● Starting Self-Diagnostic Function in the protection cancel mode

If the protection function works and causes hindrance to troubleshooting, cancel the protection function by the procedure below, and it will be possible to enter the self-diagnostic function mode. (The protection functions other than the excess current detect function will be disabled.)

While pressing the “PRESET <” and “DIMMER” keys, press the “⏻” (Power) key to turn on the power and keep pressing those 2 keys for 3 seconds or longer.

The self-diagnostic function mode is activated with the protection functions disabled.

In this mode, the “SLEEP” segment of the FL display flashes to indicate that the mode is self-diagnostic function mode with the protection functions disabled.

### CAUTION!

Using this unit with the protection function disabled may cause further damage to this unit. Use special care for this point when using this mode.

## ● Canceling Self-Diagnostic Function

1. Before canceling self-diagnostic function, execute setting for “S1. FACTORY PRESET” menu. (Memory initialization inhibited or Memory initialized).

\* In order to keep the user memory preserved, be sure to select PRESET INHIBIT (Memory initialization inhibited).

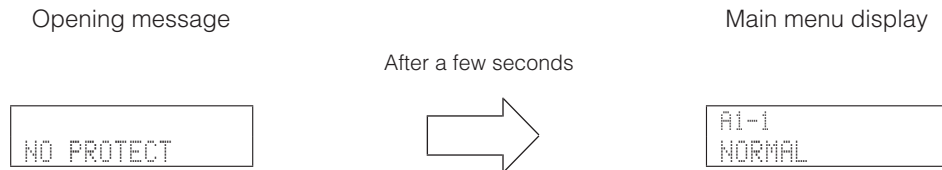
2. Press the “⏻” (Power) key to turn off the power.

## ● Display provided when Self-Diagnostic Function started

The display is as described below depending on the situation when the power to this unit is turned off.

### 1. When the power is turned off by usual operation:

“NO PROTECT” is displayed. Then “A1-1. NORMAL” is displayed in a few seconds.



### 2. When the protection function worked to turn off the power:

The information of protection function which worked at that time is displayed. Then “A1-1. NORMAL” is displayed in a few seconds.

Note: At that time if you restart the self-diagnostic function after turning off the power once, “NO PROTECT” will be displayed. That is because that situation is equal to “1. When the power is turned off by usual operation:”.

However history of the protection function is stored in memory as backup data. For details, refer to “P2. PROTECTION HISTORY” menu.

#### 2-1. When there is a history of protection function due to excess current.


A rectangular box containing the text "I PROTECT".

**Cause:** An excessive current flowed through the power amplifier.

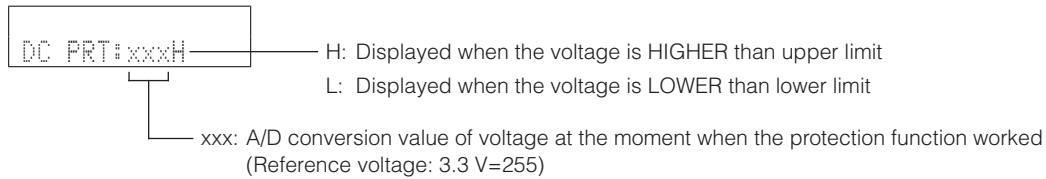
**Supplementary information:** As current of the power amplifier is detected, the abnormal channel can be identified by checking the current detect transistor.

Turning on the power without correcting the abnormality will cause the protection function to work immediately and the power supply will instantly be shut off.

#### Notes:

- Applying the power to this unit without correcting the abnormality can be dangerous and cause additional circuit damage. To avoid this, if “I PROTECT” protection function works 1 time, the power will not turn on even when the “” (Power) key is pressed. In order to turn on the power again, start up the self-diagnostic function.
- The output transistors in each amplifier channel should be checked for damage before applying power to this unit.
- Amplifier current should be monitored by measuring DC voltage across the emitter resistors for each channel.

## 2-2. When the protection function worked due to abnormal DC output.

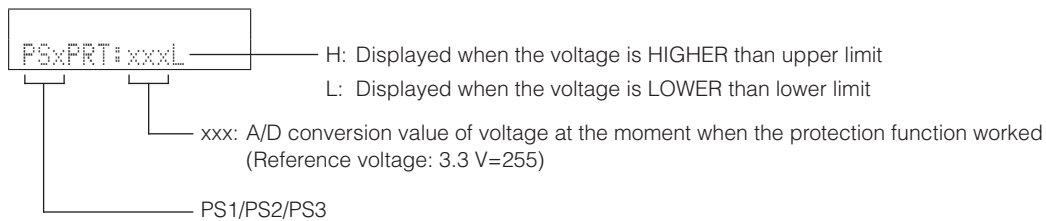


**Cause:** DC output of the power amplifier is abnormal.

**Supplementary information:** The protection function worked due to a DC voltage appearing at the speaker terminal. A cause could be a defect in the amplifier.

Turning on the power without correcting the abnormality will cause the protection function to work in 5 seconds and the power supply will be shut off.

## 2-3. When the protection function worked due to abnormal voltage in the power supply section.




**Cause:** The voltage in the power supply section is abnormal.

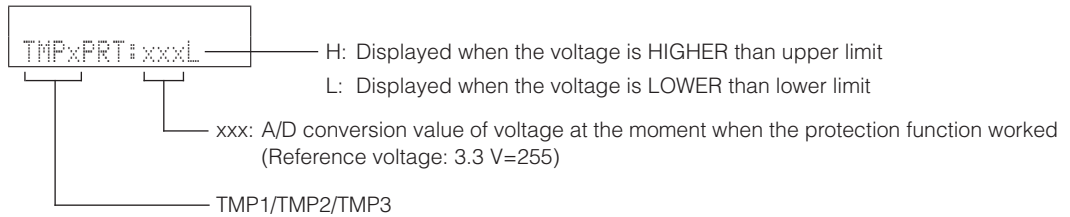
**Supplementary information:** The protection function worked due to a defect or overload in the power supply.

Turning on the power without correcting the abnormality will cause the protection function to work in 1 seconds and the power supply will be shut off.

### Notes:

- Applying the power to this unit without correcting the abnormality can be dangerous and cause additional circuit damage. To avoid this, if “PS” and “DC” protection function works 3 times consecutively, the power will not turn on even when the “” (Power) key is pressed. In order to turn on the power again, start up the self-diagnostic function.
- The output transistors in each amplifier channel should be checked for damage before applying power to this unit.
- Amplifier current should be monitored by measuring DC voltage across the emitter resistors for each channel.

#### 2-4. When the protection function worked due to excessive heatsink temperature.



**Cause:** The temperature of the heatsink is excessive.

**Supplementary information:** The protection function worked due to the temperature limit being exceeded. Causes could be poor ventilation or a defect related to the thermal sensor.

Turning on the power without correcting the abnormality will cause the protection function to work in 1 seconds and the power supply will be shut off.

#### ● History of protection function

When the protection function has worked, its history is stored in memory as backup data.

Even if no abnormality is noted while servicing the unit, an abnormality which has occurred previously can be defined as long as the backup data has been stored.

For details, refer to "P2. PROTECTION HISTORY" menu.

## ● Operation procedure of Main menu and Sub-menu

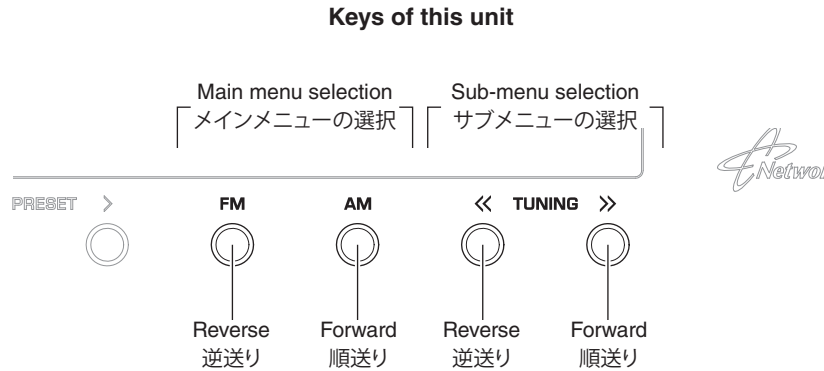
There are 14 main menu items, each of which has sub-menu items.

### Main menu selection

Select the main menu using “AM” (forward) and “FM” (reverse) keys.

### Sub-menu selection

Select the sub-menu using “TUNING >>” (forward) and “TUNING <<” (reverse) keys.



## ● Functions in Self-Diagnostic Function mode

In addition to the self-diagnostic function menu items, functions listed below are available.

- Power ON/OFF
- Master volume
- Muting
- Input selection
- \* Functions related to the tuner and the set menu are not available.

## ● Initial settings when Self-Diagnostic Function started

The following initial settings are used when self-diagnostic function is started.

When self-diagnostic function is canceled, these settings are restored to those before starting self-diagnostic function.

- Master volume: -20 dB
- Input: LINE1
- Speaker setting: SPEAKERS A ON  
SPEAKERS B ON

## ● Details of Self-Diagnostic Function menu

### A1. AUDIO SET

This menu is used to check audio signal route.

#### A1-1. NORMAL

The audio signal input to LINE 1 jack is output.

```
A1-1
NORMAL
```

#### A1-2. PRE MUTE

The audio signal output is muted.

MUTE control port: MT\_N\_5CH (FRONT L/R, CENTER, SURROUND L/R channels, 60 pin on IC21)  
MT\_N\_SW (SUBWOOFER channel, 51 pin on IC21)

```
A1-2
PRE MUTE
```

#### A1-3. VOL MUTE

The sound signal output is muted inside of IC431 (Selector and E-Volume IC).

```
A1-3
VOL MUTE
```

#### A1-4. AC B : HIGH

Not for service.

```
A1-4
AC_B:Hi
```

#### A1-5. AC B : LOW

Not for service.

```
A1-5
AC_B:Lo
```

### A2. DIR PLL (Phase Lock Loop)

This menu is used to check the route of digital audio signal input to OPTICAL 1/OPTICAL 2/COAXIAL 1/COAXIAL 2 jack.

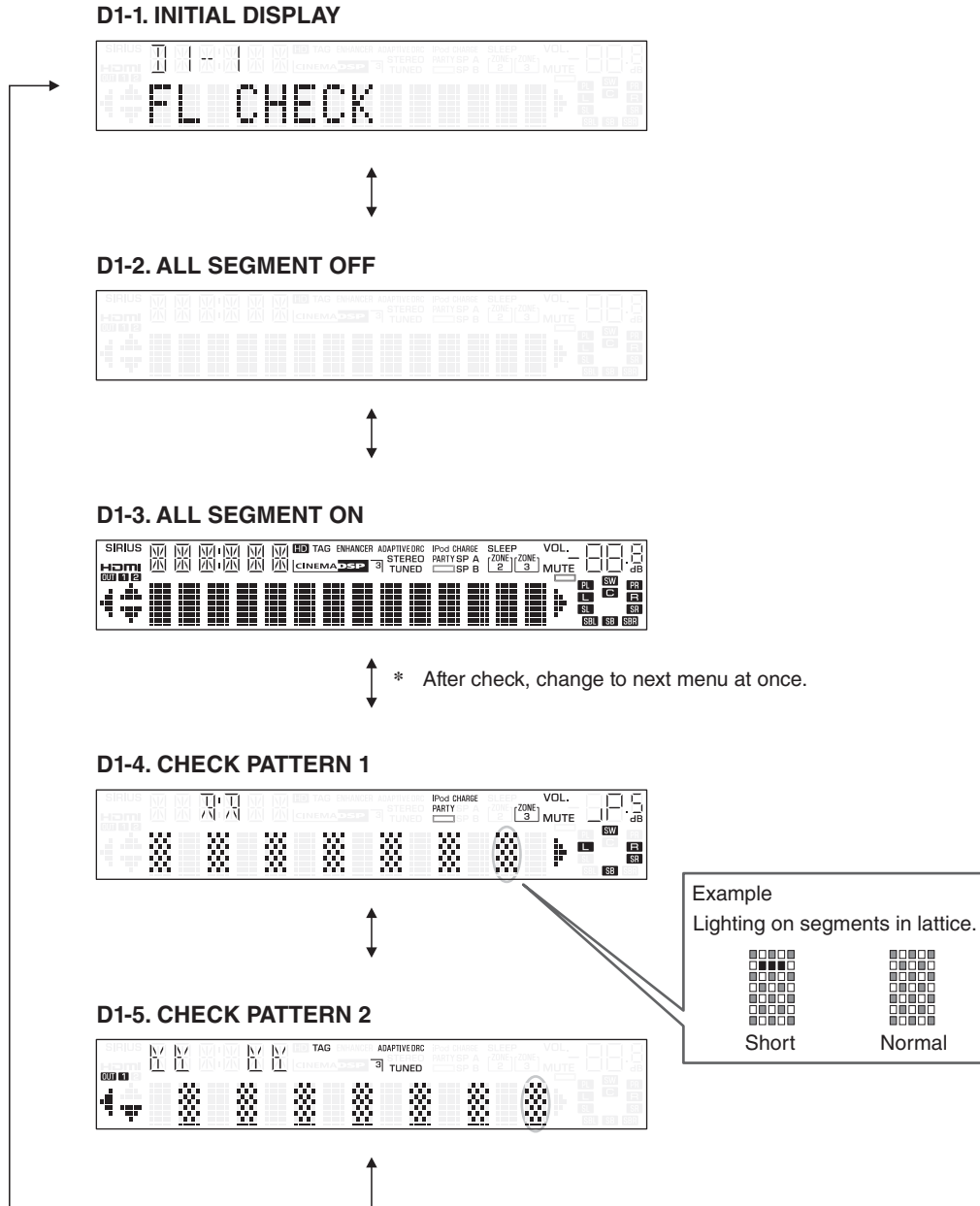
```
A2-1
DIR PLL:----
```

Lock: Lock  
Unlock: Unlock  
---: When the analog input is selected for the input source

## D1. FL CHECK

This menu is used to check operation of the FL display.

### FL display



Segment conditions of the FL tube is checked by turning ON and OFF all segments.

Next, a short between segments next to each other is checked by turning ON and OFF all segments alternately (in lattice).

(In the above example, the segments in the second row from the top are shorted.)



## U1. USB

This menu is used to check the audio signal route from USB storage device.

### U1-1. USB FRONT 1 TRACK

The 1st music file stored in the USB storage device connected to the USB jack is reproduced.

- \* Copy 2 or more music files from PC to the root folder of the USB storage device in advance.

```
U1-1
USB_F 1 TRACK
```

### U1-2. USB\_VBUS HIGH POWER

Not for service.

```
U1-2
USB_VBUS_HPWR
```

## N1. NETWORK

This menu is used to check functions related to NETWORK.

Connect between LAN port of broadband router and NETWORK jack of this unit with a network cable.

- \* When the network condition varies while sub-menu is displayed (e.g., the network is deactivated once), the correct result will not be displayed.

In that case, once turn off the power to this unit, then start up the self-diagnostic function again and select this menu.

### N1-1. IP ADDRESS CHECK

This menu is used to check that IP address can be obtained.

```
N1-1
IP AD CHK:OK
```

OK: Connected (IP address obtained)  
NG: No traffic / Disconnected

### N1-2. MAC ADDRESS CHECK

This menu is used to check that MAC address is written.

```
N1-2
MAC AD CHK:OK
```

OK: Normal  
NG: Unwritten

**N1-3. LINE NOISE 100 MDI**

Not for service.

```
N1-3
LN MDI 100
```

**N1-4. LINE NOISE 100 MDIX**

Not for service.

```
N1-4
LN MDIX 100
```

**N1-5. LINE NOISE 10 MDI**

Not for service.

```
N1-5
LN MDI 10
```

**N1-6. LINE NOISE 10 MDIX**

Not for service.

```
N1-6
LN MDIX 10
```

**N1-7. LINK CHECK**

This menu is used to check that the broadband router is connected correctly.

```
N1-7
LINK CHK:OK
```

OK: Connected

NG: No traffic / Disconnected

**N1-8. EXT TEST**

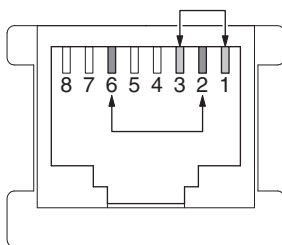
Transmission/reception of the NETWORK port is checked.

With the power turned off, short the pins of the NETWORK jack as shown in the figure below.

Start up the self-diagnostic function and select this menu.

Transmission/reception test is executed and its result is displayed.

**Note) Be sure to return the shorted pins to their original condition after executing this test.**



**NETWORK jack**

```
N1-8
EXT TEST:OK
```

OK: Normal

NG: Abnormal

--: Checking

## C1. ACCESS CHECK

This menu is used to check the communication and bus line connection between devices on DIGITAL P.C.B.

### C1-1. ALL

The total detection result of sub-menus from C1-2 to C1-4 is displayed.

```
C1-1
ALL:OK
```

OK: No error detected  
 NG: An error is detected  
 --: Checking

### C1-2. BUS DIR

Communication and bus line connection between microprocessor (IC21) and DIR (IC61) are checked.

```
C1-2
DIR BUS:OK
```

OK: No error detected  
 NG: An error is detected  
 --: Checking

### C1-3. EEPROM

EEPROM (IC22)'s reading/writing is checked.

```
C1-3
EEPROM:OK
```

OK: No error detected  
 NG: An error is detected  
 --: Checking

### C1-4. TUNER

The AM/FM TUNER I2C (Inter integrated circuit) bus line connection is checked.

```
C1-4
TUNER:OK
```

OK: No error detected  
 NG: An error is detected  
 --: Checking

## C2. NETWORK IC CHECK

This menu is used to check the communication and bus line connection between devices related to network.

### C2-1. ALL

The total detection result of sub-menus from C2-2 to C2-4 is displayed.

```
C2-1
ALL:OK
```

OK: No error detected  
 NG: An error is detected  
 --: Checking

### C2-2. NET RAM

Communication and bus line connection between network microprocessor (IC21) and SDRAM (IC952) are checked.

```
C2-2
NET RAM:OK
```

OK: No error detected  
 NG: An error is detected  
 --: Checking

### C2-3. PHY (Ethernet PHYceiver) TEST

The perform a loopback test in PHY (IC955).

```
C2-3
PHY TEST:OK
```

OK: No error detected  
 NG: An error is detected  
 --: Checking

### C2-4. APL (Apple) ID CHECK

Apple authentication IC (IC956) device ID is checked.

```
C2-4
APL ID:OK
```

OK: No error detected  
 NG: An error is detected  
 --: Checking

## P1. AD DATA CHECK

This menu is used to display the A/D conversion value of the microprocessor which detects panel keys and protection functions by using the sub-menu.

When "P1-7. KEY" sub-menu is selected, keys become inoperable due to detection of the values of all keys. However, it is possible to advance to the next menu by turning the VOLUME knob.

\* Numeric values in the figure are given as reference only.

### P1-1. DC


Power amplifier DC (DC voltage) output is detected.

The voltage at 120 pin (DC\_PRT) of IC21 is displayed.

Normal value: 38 to 156

(Reference voltage: 3.3 V=255)

\* If DC becomes out of the normal value range, the protection function works to turn off the power.



```

P1-1
DC: 112
  
```

### P1-2. PS

Power supply voltage (PS) protection detection.

The voltage at 126 pin (PS1\_PRT)/107 pin (PS2\_PRT)/106 pin (PS3\_PRT) of IC21 are displayed.

Voltage detects

**PS1:** BL2, AC\_12, ±7A, +3.3S

**PS2:** ±12A, +5A, -VP

**PS3:** +5.5V

Normal value

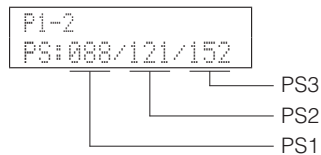
**PS1:** 26 to 150

**PS2:** 63 to 197

**PS3:** 132 to 168

(Reference voltage: 3.3 V=255)

\* If PS1, PS2 or PS3 becomes out of the normal value range, the protection function works to turn off the power.



```

P1-2
PS:088/121/152
  
```

PS3  
PS2  
PS1

**P1-3. TMP**

Temperature of the heatsink (THM) is detected.

The voltage at 122 pin (THM1)/123 pin (THM2) /110 pin (THM3) of IC21 is displayed.

Normal value

**THM1:** 54 to 255 (U, C, R, K, A, B, G, S models)

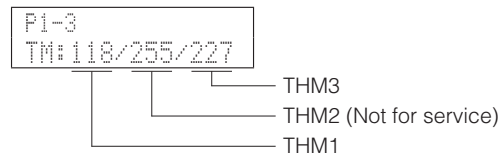
57 to 255 (L model)

**THM2:** (Not for service)

**THM3:** 115 to 255

(Reference voltage: 3.3 V=255)

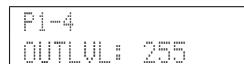
\* If THM1, THM2 or THM3 becomes out of the normal value range, the protection function works to turn off the power.

**P1-4. OUTPUT LEVEL**

Output level of speaker output is detected.

The voltage at 121 pin (AMP\_OLV) of IC21 is displayed.

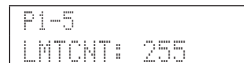
(Reference voltage: 3.3 V=255)

**P1-5. LIMITER CONTROL**

Power limiter control is detected.

The voltage at 7 pin (AMP\_LMT) of IC21 is displayed.

(Reference voltage: 3.3 V=255)

**P1-6. USB-VBUS**

Power supply voltage of USB jack is detected.

The voltage at 109 pin (USB\_VBUS\_PRT) of IC21 is detected.

(Reference voltage: 3.3 V=255)



**P1-7. KEY**

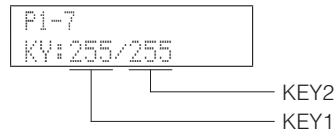
Panel key is detected.

When the A/D conversion value of the panel key becomes out of the specified range, normal operation will not be available.

In that case, check the constant of voltage dividing resistor, solder condition, etc. Refer to table.

\* When "P1-7. KEY" menu is selected, keys become inoperable due to detection of the values of all keys. However, it is possible to advance to the next menu by turning the VOLUME knob.

(Reference voltage: 3.3 V=255)



Display	KEY1
000 – 011	ENTER
012 – 032	RETURN
033 – 054	TUNING >>
055 – 077	TUNING <<
078 – 098	AM
099 – 120	FM
121 – 143	PRESET >
144 – 165	PRESET <

Display	KEY2
000 – 011	CLEAR
012 – 032	MEMORY
033 – 054	DISPLAY
055 – 077	DIMMER
078 – 098	SPEAKERS A
099 – 120	SPEAKERS B

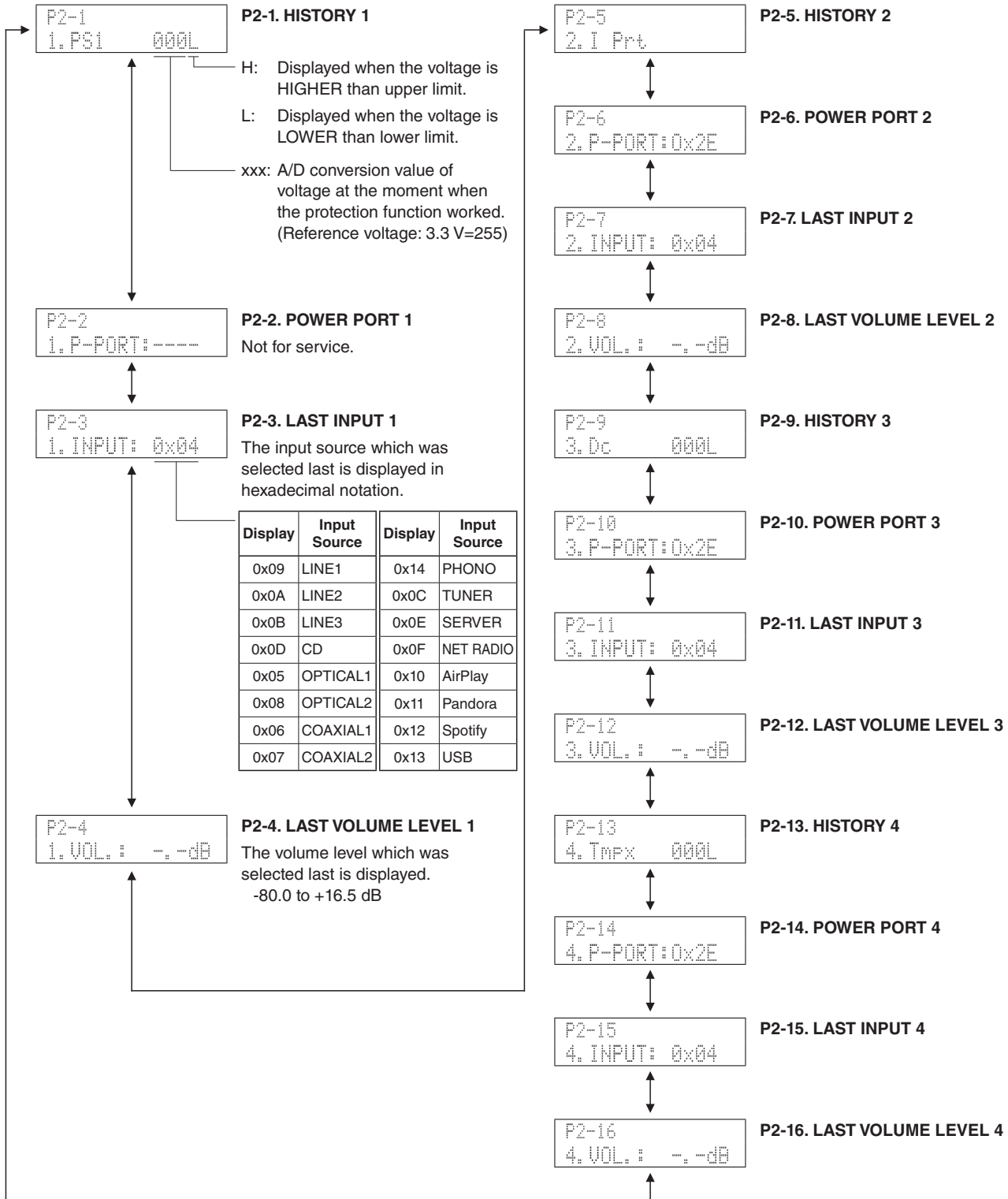
## P2. PROTECTION HISTORY

This menu is used to display the history of protection function.

In the history 1 to 4, the setting information for operation of each protection function will be stored.

All history of protection function and setting information will be erased by pressing the "RETURN" key.

\* Numeric values in the figure are given as reference only.



R-N500



**T1. TROUBLE SHOOTING INFORMATION**

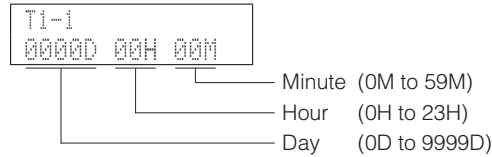
This menu is used to display the operating time and operation frequency of this unit.

\* The operating time and operation frequency during the self-diagnostic function mode will not be stored.

**T1-1. OPERATING TIME**

The operating time of this unit is displayed.

The operating time will be erased by pressing the "RETURN" key.



**T1-2. POWER-RELAY ON**

The operation frequency of the power relay (RY541) is displayed in hexadecimal notation.

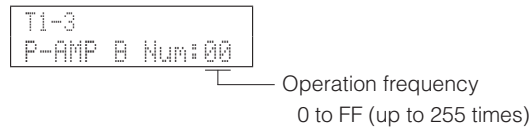
The operation frequency will be erased by pressing the "RETURN" key.



**T1-3. POWER AMP B**

The operation frequency of the POWER AMP B relay (RY204) is displayed in hexadecimal notation.

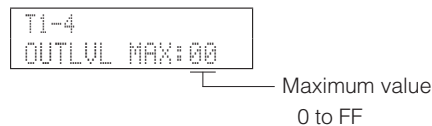
The operation frequency will be erased by pressing the "RETURN" key.



**T1-4. OUTPUT LEVEL**

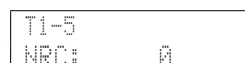
The maximum value of the speaker output level is displayed in hexadecimal notation.

The maximum value will be erased by pressing the "RETURN" key.



**T1-5. NRC (Net Restart Counter)**

Not for service.



## S1. FACTORY PRESET

This menu is used to reserve/inhibit initialization of the back-up IC (EEPROM: IC22 on DIGITAL P.C.B.).

```
S1-1
PRESET INHI
```

### S1-1. PRESET INHIBIT (Initialization inhibited)

Initialization of the back-up IC is not executed. Select this sub-menu to protect the values set by the user.



```
S1-2
PRESET RSRV
```

### S1-2. PRESET RESERVED (Initialization reserved)

Initialization of the back-up IC is reserved. (Actual initialization is executed when the power is turned on next.) To reset to the original factory settings or to reset the backup IC, select this sub-menu and press the "⏻" (Power) key to turn off the power.

**CAUTION:** Before setting to the PRESET RESERVED, write down the existing preset memory content of the tuner. (This is because setting to the PRESET RESERVED will cause the user memory content to be erased.)

## S2. ROM VERSION/CHECKSUM

The firmware version and checksum values are displayed.

The checksum is obtained by adding the data at every 8-bit and expressing the result as a hexadecimal notation.

\* Numeric values in the figure are given as reference only.

```
S2-1
System: 0.13
```

### S2-1. SYSTEM VERSION

The firmware version is displayed.



```
S2-2
Ver: 0013
```

### S2-2. MICROPROCESSOR VERSION

The firmware version of MICROPROCESSOR (IC21 on DIGITAL P.C.B.) is displayed.



```
S2-3
Sum: 3F8C
```

### S2-3. MICROPROCESSOR CHECKSUM

The checksum value of MICROPROCESSOR (IC21 on DIGITAL P.C.B.) is displayed.



```
S2-4
N:0050
```

### S2-4. NETWORK VERSION

The firmware version of Network microprocessor (IC951 on DIGITAL P.C.B.) is displayed.



```
S2-5
N-Sum: 62B61B98
```

### S2-5. NETWORK CHECKSUM

The checksum value of Network microprocessor (IC951 on DIGITAL P.C.B.) is displayed.



### S3. SOFT SWITCH

Not for service.

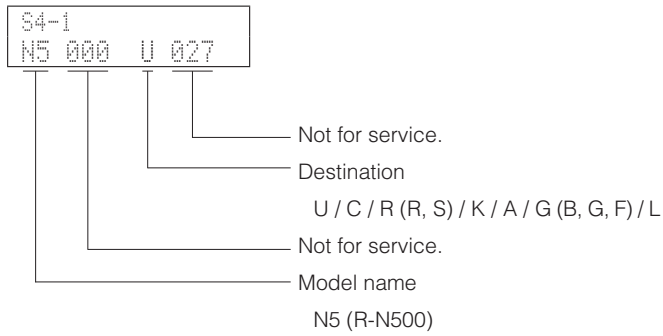
```
S3-1
SW :PCB
```

### S4. SYSTEM INFORMATION

This menu is used to display the model name and destination.

#### S4-1. MODEL/DESTINATION

The model name and destination are displayed.



#### S4-2. VERIFY

Not for service.

```
S4-2
Verify 255 00
```

## ■ POWER AMPLIFIER ADJUSTMENT

1. Right after power is turned on, confirm that the voltage across the terminals of R2050 (Rch) and R2049 (Lch) are within the confines of 0.05 mV to 2.5 mV.
2. If measured voltage exceeds 2.5 mV, remove R2032 (Rch) and R2029 (Lch), and then reconfirm the voltage.

### Attention

If the measured voltage exceeds 2.5 mV after repairing the power amplifier, check other parts again for any possible defect before removing the resistor.

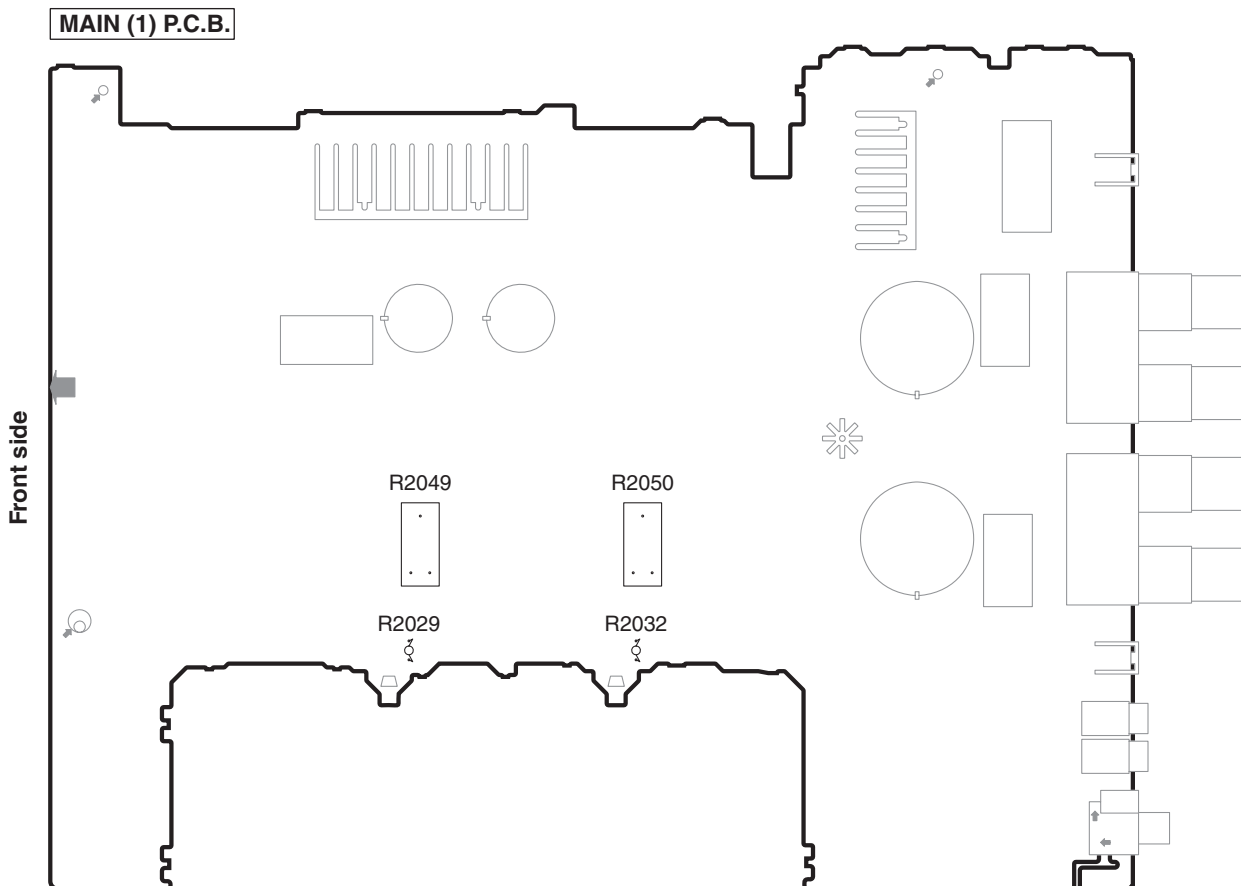
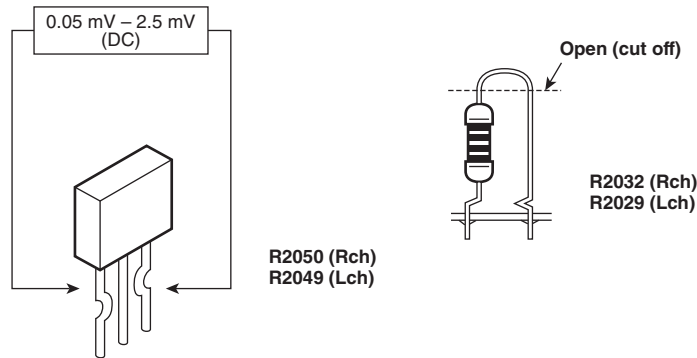
3. Confirm that the voltage is within the confines of 0.1 mV to 15 mV after 60 minutes.

1. 電源投入直後、R2050 (Rch)、R2049 (Lch) の端子間電圧を測定し、0.05 mV から 2.5 mV の間であることを確認してください。
2. 電圧が 2.5 mV を超えている場合は、R2032 (Rch)、R2029 (Lch) を外し、電圧を再確認してください。

### 注意

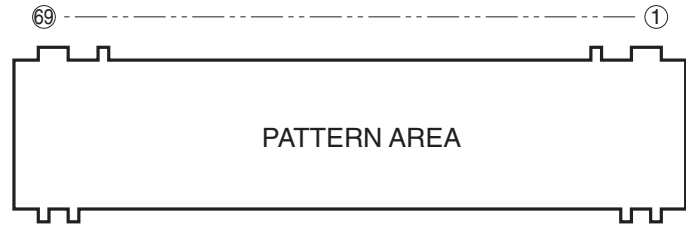
パワーアンプ修理後に 2.5 mV を超えている場合は、抵抗を外す前に故障箇所を調べてください。

3. 60 分後、電圧が 0.1 mV ~ 15 mV であることを確認してください。



# ■ DISPLAY DATA

## ● V4001 : 18-MT-11GNAK (OPERATION (1) P.C.B.)



## ● PIN CONNECTION

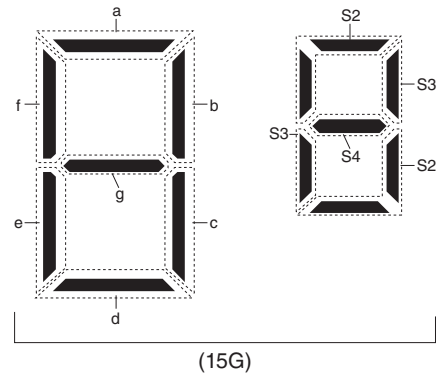
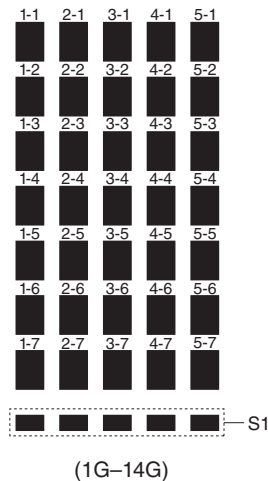
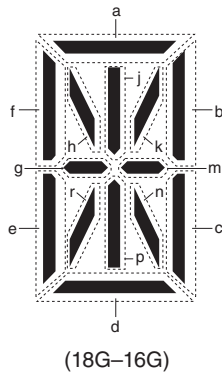
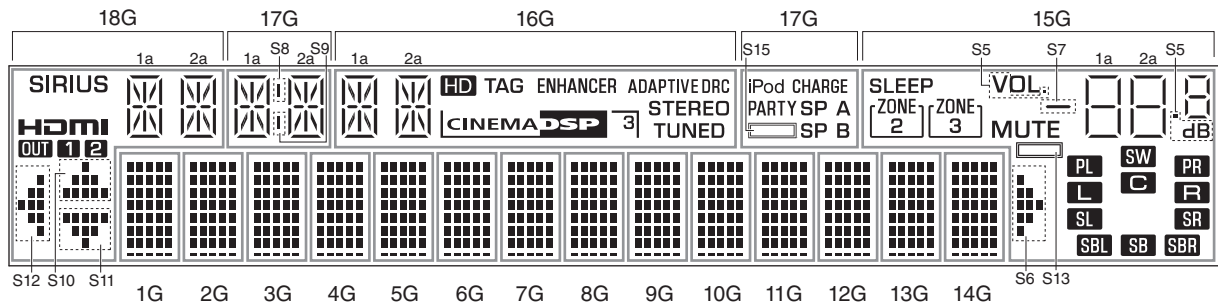
Pin No.	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
Connection	F2	NX	NP	NP	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	P23	P24	P25	P26	P27	P28	P29	P30	P31

Pin No.	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Connection	P32	P33	P34	P35	P36	NX	NX	NX	NX	NX	NX	NX	18G	17G	16G	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G	NP	NP	NX	F1

Note : 1) F1, F2 ..... Filament pin 2) NP ..... No pin 3) NX ..... No extend pin 4) 1G-18G ..... Grid pin

## ● GRID ASSIGNMENT



## ● ANODE CONNECTION

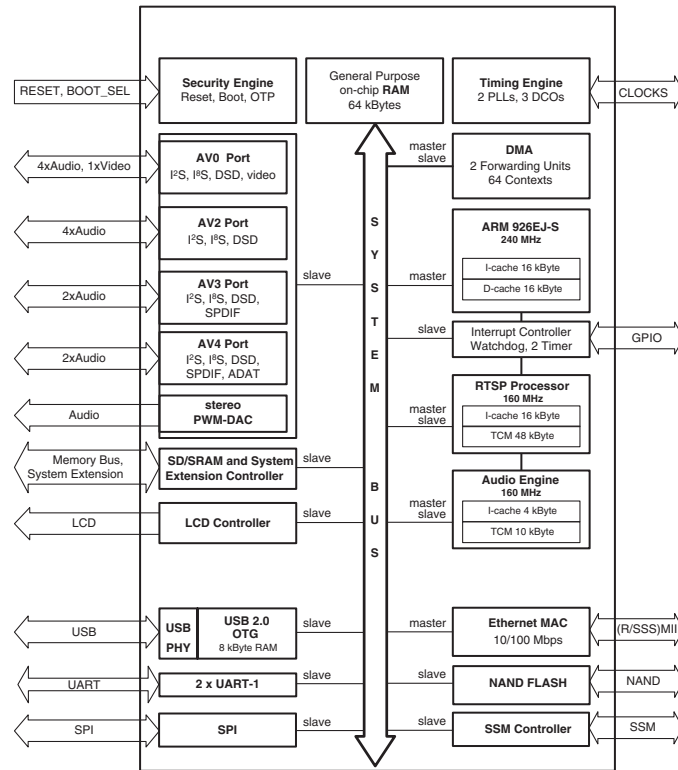
	18G	17G	16G	15G	1G-14G
P1	1a	1a	1a	S5	1-1
P2	1h	1h	1h	S7	2-1
P3	1j	1j	1j	1d	3-1
P4	1k	1k	1k	2d	4-1
P5	1b	1b	1b	S2	5-1
P6	1f	1f	1f	1e	1-2
P7	1m	1m	1m	2e	2-2
P8	1g	1g	1g	S3	3-2
P9	1c	1c	1c	1c	4-2
P10	1e	1e	1e	2c	5-2
P11	1r	1r	1r	S4	1-3
P12	1p	1p	1p	1g	2-3
P13	1n	1n	1n	2g	3-3
P14	1d	1d	1d	1f	4-3
P15	2a	2a	2a	2f	5-3
P16	2h	2h	2h	1b	1-4
P17	2j	2j	2j	2b	2-4
P18	2k	2k	2k	1a	3-4
P19	2b	2b	2b	2a	4-4
P20	2f	2f	2f	<b>PL</b>	5-4
P21	2m	2m	2m	<b>SW</b>	1-5
P22	2g	2g	2g	<b>PR</b>	2-5
P23	2c	2c	2c	<b>L</b>	3-5
P24	2e	2e	2e	<b>C</b>	4-5
P25	2r	2r	2r	<b>R</b>	5-5
P26	2p	2p	2p	<b>SL</b>	1-6
P27	2n	2n	2n	<b>SR</b>	2-6
P28	2d	2d	2d	<b>SBL</b>	3-6
P29	<b>SIRIUS</b>	S8	<b>HD</b>	<b>SB</b>	4-6
P30	<b>OUT</b>	S9	<b>TAG</b>	<b>SBR</b>	5-6
P31	<b>HDMI</b>	iPod CHARGE	<b>CINEMA DSP</b>	S6	1-7
P32	<b>1</b>	<b>SP B</b>	<b>3</b>	S13	2-7
P33	<b>2</b>	S15	<b>STEREO</b>	<b>MUTE</b>	3-7
P34	S12	<b>SP A</b>	<b>TUNED</b>	<b>ZONE 2</b>	4-7
P35	S10	<b>PARTY</b>	<b>ENHANCER</b>	<b>ZONE 3</b>	5-7
P36	S11	-	<b>ADAPTIVE DRC</b>	<b>SLEEP</b>	S1

# IC DATA

IC951: DM860A (DIGITAL P.C.B.)

Network microprocessor

\* No replacement part available.



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
A	USBDN	VDD33 USBC	VSS33 USBC	n.c.	n.c.	VDD33	RFCLKP	RFRXOP	RFRXIP	HIGHZ	SSMD0	SSMD4	SSMCMC	RXD1	TDO	TDI	A0	A1	A	
B	USBDP	VDD33 USBT	VSS33 USBT	n.c.	n.c.	VSS	RFCLKN	RFRXON	RFRXIN	TEST1	SSMD1	SSMD5	TXD1	RXD0	TMS	SPICLK	SPINCS1	A2	B	
C	VSS12 USB	USBREXT	USBXO	USBXI	NRES12 OUT	VSS	RREF	n.c.	n.c.	SSMCLK	SSMD2	SSMD6	TXD0	TCK	SPINCS0	A3	A4	A5	C	
D	VDD12 USB	USBVBUS	USBATST	NRES33 OUT	NRES33 REF	NRES12 REF	VDD33	VDD12	SSMWP	SSMCP	SSMD3	SSMD7	NRESET	SPIDI	SPIDO	A6	A7	A8	D	
E	VSS33 RTC	USBDID	USBVB USDRV	NC	VDD12 CORE	VDD12 CORE	VDD33IO	VDD33IO	VDD12 CORE	VDD12 CORE	VDD33IO	VDD33IO		A9	A10	A11	A12		E	
F	VDD33 RTC	RTCXIN	VDD33 PLL	NC	VDD33IO	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VDD12 CORE	A13_RAS	A14_CAS	A15_BA0	A16_BA1	F	
G	VDD12 DCO	RTCXOUT	VSS33 PLL	NC	VDD33IO	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VDD12 CORE	A17_DQ M0	A18_DQ M1	A19	A20	G	
H	VSS12 DCO	VSS12 PLL	VDD12 PLL	NC	VDD12 CORE	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VDD33IO	A21	A22	A23	NCS3	H	
J	PDOU1	VCO1	XTALO	NC	VDD12 CORE	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VDD33IO	NCS0	NCS1	NCS2	MEMCKE	J	
K	PDOU0	VCO0	XTALI	AOUTLP	VDD33IO	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VDD12 CORE	MEMCLK	NWE	NOE	NWAIT	K	
L	AV0CLK	AOUTLN	AOUTRN	AOUTRF	VDD33IO	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VDD12 CORE	D3	D2	D1	D0	L	
M	AV0 CTRL0	AV0 CTRL1	AV0 CTRL2	AV0 DATA3	VDD12 CORE	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VDD33IO	D7	D6	D5	D4	M	
N	AV0 DATA2	AV0 DATA1	AV0 DATA0	AV1 DATA3	VDD12 CORE	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VSS	VDD33IO	D11	D10	D9	D8	N	
P	AV1 DATA2	AV1 DATA1	AV1 DATA0	AV2 DATA3		VDD33IO	VDD33IO	VDD12 CORE	VDD12 CORE	VDD33IO	VDD33IO	VDD12 CORE	VDD12 CORE		FD0	FD1	D13	D12	P	
R	AV2CLK	AV2 CTRL1	AV2 DATA2	AV3 CLK	AV3 DATA1	LCDD11	LCDD7	LCDD3	LCDD1	VPP	MIITXEN	MIITXCLK	MIIRXER	MIICRS	FD2	FD3	FD4	D14	R	
T	AV2 CTRL0	AV2 DATA1	AV3 CTRL1	AV3 DATA0	LCDD14	LCDD10	LCDD6	LCDD2	LCDD1	LCDD1	MIITXER	MIIRXCLK	MIICOL	MIIRXDV	FD5	FD6	FD7	D15	T	
U	AV2 DATA0	AV3 CTRL0	AV4 DATA1	LCDD16	LCDD13	LCDD9	LCDD5	LCDD1	LCDD1	LCDD1	MIITXD0	MIITXD2	MIIRXD0	MIIRXD2	MIIMDIO	NFCE0	FCLE	NFWE	NFRB	U
V	NC	AV4 DATA0	LCDD17	LCDD15	LCDD12	LCDD8	LCDD4	LCDD0	LCDD0	LCDD0	MIITXD1	MIITXD3	MIIRXD1	MIIRXD3	MIIMDC	MIIPHY CLK	NFWP	NFRE	FALE	V
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		

## AV-Port 0

Pin No.	Function Name	I/O	Detail of Function
M4	AV0DATA[3:0]	I/O	Audio/video data. Several formats are supported.
N1			
N2			
N3			
N4	AV1DATA[3:0]	I/O	Video data, together with AV0DATA[3:0]: AV0DATA[3:0] = video[3:0] AV1DATA[3:0] = video[7:4]
P1			
P2			
P3			
L1	AV0CLK	I/O	Data clock. Depending on the AV-Port 0 configuration, this clock is a bit- or byte-clock which is used to transmit or receive the AV0DATA[*] synchronously.
M1	AV0CTRL0	I/O	Configurable sync signal: <ul style="list-style-type: none"> <li>Serial audio formats: LRCK input or output.</li> <li>Video formats: PSYNC input or output.</li> </ul>
M2	AV0CTRL1	I/O	Configurable sync signal: <ul style="list-style-type: none"> <li>Serial audio formats: Master clock output.</li> <li>Video formats: DVALID input or output.</li> </ul>
M3	AV0CTRL2	I/O	Configurable sync signal: <ul style="list-style-type: none"> <li>Video formats: FSYNC input or output.</li> </ul>

## AV-Port 2

Pin No.	Function Name	I/O	Detail of Function
P4	AV2DATA[3:0]	I/O	Audio data. Several formats are supported.
R3			
T2			
U1			
R1	AV2CLK	I/O	Data clock. Depending on the AV-Port 2 configuration this clock is a bit-clock which is used to transmit or receive the AV2DATA[*] synchronously.
T1	AV2CTRL0	I/O	Configurable sync signal: Serial audio formats: LRCK input or output.
R2	AV2CTRL1	I/O	Configurable sync signal: Serial audio formats: Master clock output.

## AV-Port 3

Pin No.	Function Name	I/O	Detail of Function
R5	AV3DATA[1:0]	I/O	Audio data. Several formats are supported.
T4			
R4	AV3CLK	I/O	Data clock. Depending on the AV-Port 3 configuration this clock is a bit-clock which is used to transmit or receive the AV3DATA[*] synchronously.
U2	AV3CTRL0	I/O	Configurable sync signal: Serial audio formats: LRCK input or output.
T3	AV3CTRL1	I/O	Configurable sync signal: Serial audio formats: Master clock output.

## AV-Port 4

Pin No.	Function Name	I/O	Detail of Function
U3	AV4DATA[1:0]	I/O	Audio data. Several formats are supported.
V2			

## PWM-DAC

Pin No.	Function Name	I/O	Detail of Function
K4	AOUTLP	O	Left channel PWM output (positive).
L2	AOUTLN	O	Left channel PWM output (negative).
L4	AOUTRP	O	Right channel PWM output (positive).
L3	AOUTRN	O	Right channel PWM output (negative).

## UART Interface

Pin No.	Function Name	I/O	Detail of Function
B14	RXD0	I	UART-0 receive signal.
C13	TXD0	O	UART-0 transmit signal.
A14	RXD1	I	UART-1 receive signal.
B13	TXD1	O	UART-1 transmit signal.



## Serial Peripheral Interface (SPI)

Pin No.	Function Name	I/O	Detail of Function
D14	SPIDIN	I	SPI data receive.
D15	SPIDOUT	O	SPI data transmit.
B16	SPICLK	I/O	SPI clock.
C15	SPINCS0	I/O	Multi-master mode: Chip-select input (used to detect bus conflict). Master only mode: Chip-select 1 output. Slave mode: Chip-select input.
B17	SPINCS1	I/O	Multi-master mode: Chip-select 2 output. Master only mode: Chip-select 2 output. Slave mode: Not used.

## External Memory Interface

Pin No.	Function Name	I/O	Detail of Function
T18	D[15:0]	I/O	Data bus for external memory and peripheral access.
R18			
P17			
P18			
N15			
N16			
N17			
N18			
M15			
M16			
M17			
M18			
L15			
L16			
L17			
L18	A[12:0]	O	Address bus for external memory and peripheral access.
E18			
E17			
E16			
E15			
D18			
D17			
D16			
C18			
C17			
C16			
B18	A13_RAS	O	SRAM: Address output SDRAM: Row access strobe
A18			
A17	A14_CAS	O	SRAM: Address output SDRAM: Column access strobe
F15			
F16	A15_BA0	O	SRAM: Address output SDRAM: Bank select
F17			
F18	A16_BA1	O	SRAM: Address output SDRAM: Bank select
G15			
G16	A17_DQM0	O	SRAM: Address output SDRAM: Data mask
H17			
H16	A[23:19]	O	Address bus for external memory and peripheral access.
H15			
G18			
G17			

Pin No.	Function Name	I/O	Detail of Function
H18	NCS[3:0]	O	Chip select signals. The active memory range for NCS[n] (active low) can be configured. <ul style="list-style-type: none"> <li>• NCS[0] supports SRAM, can be used for booting.</li> <li>• NCS[1] supports SDRAM or SRAM.</li> <li>• NCS[2] supports SRAM.</li> <li>• NCS[3] supports SRAM.</li> </ul>
J17			
J16			
J15			
K17	NOE	O	Output enable, asserted (low) for read operations.
K16	NWE	O	Write enable, asserted (low) for write operations.
K18	NWAIT	I	External wait line. If NWAIT is asserted, memory access will be stalled. Can be configured as either low-active (default) or high-active.
K15	MEMCLK	O	SDRAM system clock.
J18	MEMCKE	O	SDRAM clock enable.

#### NAND-Flash Interface

Pin No.	Function Name	I/O	Detail of Function
T17	FD[7:0]	I/O	Bi-directional data bus.
T16			
T15			
R17			
R16			
R15			
P16			
P15			
V18	FALE	O	Address latch enable; pull-up/down defines boot mode.
U16	FCLE	O	Command latch enable; pull-up/down defines boot mode.
U15	NFCE0	O	Chip-enable, low-active.
U18	NFRB	I	Ready/busy. NAND flash is busy when NFRB is low.
V17	NFRE	O	Read enable, low-active.
U17	NFWE	O	Write enable, low-active.
V16	NFWP	O	Write protect, low-active.

#### Ethernet MAC-Phy Interface (MII)

Pin No.	Function Name	I/O	MII	RMII	SMII
U14	MIIDIO	I/O	Management data	Management data	
V14	MIIMDC	O	Management clock	Management clock	
V13	MIIRXD[3]	I	RxD 3	RxD 1	
U13	MIIRXD[2]	I	RxD 2	RxD 0	
V12	MIIRXD[1]	I	RxD 1		Rx-Sync
U12	MIIRXD[0]	I	RxD 0		RxD
T12	MIIRXCLK	I	Receive clock		Receive clock
R13	MIIRXER	I	Receive error	Receive error	
T14	MIIRXDV	I	Receive data valid	Carrier sense/data valid	
V11	MIITXD[3]	O	TxD 3	TxD 1	
U11	MIITXD[2]	O	TxD 2	TxD 0	
V10	MIITXD[1]	O	TxD 1		Tx-Sync
U10	MIITXD[0]	O	TxD 0		TxD
R12	MIITXCLK	I	Transmit clock		Transmit clock
T11	MIITXER	O	Transmit error		
R11	MIITXEN	O	Transmit data enable	Transmit data enable	
T13	MIICOL	I	MII ethernet collision		
R14	MIICRS	I	MII carrier sense		
V15	MIIPHYCLK	O	25.000 MHz clock	50.000 MHz clock	125.000 MHz clock

## USB 2.0 OTG

Pin No.	Function Name	I/O	Detail of Function
B1	USBD+	I/O	Positive data line that is connected to the serial USB cable.
A1	USBD-	I/O	Negative data line that is connected to the serial USB cable.
E2	USBID	I	USB ID pin of mini-AB receptacle.
C2	USBREXT	I	External bias resistor (2K7, 1%); connect resistor to VSSUSB.
D2	USBVBUS	I	VBUS voltage sense.
E3	USBVBUSDRV	O	Control signal to control VBUS 5V voltage source.
C4	USBXTALI	I	Oscillator circuit input for a 24.000 MHz crystal (optional). Without external crystal, pull this pin to GND.
C3	USBXTALO	O	Oscillator circuit output for a 24.000 MHz crystal (optional). Without external crystal, leave this pin open.
D3	USBATST	-	Do not connect.

## Power-on Reset Pins

Pin No.	Function Name	I/O	Detail of Function
D6	NRES12REF	I	Voltage reference input. NRES12OUT is release when this input voltage exceeds VTH12.
C5	NRES12OUT	O	Open-drain reset (active low) for 1.2V core power supply.
D5	NRES33REF	I	Voltage reference input. NRES33OUT is release when this input voltage exceeds VTH33.
D4	NRES33OUT	O	Open-drain reset (active low) for 3.3V core power supply

## Real-Time Clock (RTC) Pins (RTC is Not Supported)

Pin No.	Function Name	I/O	Detail of Function
F2	RTCXIN	I	No connection. Leave this pin open circuit.
G2	RTCXOUT	O	No connection. Leave this pin open circuit.
F1	VDD33RTC	Power	No connection. Leave this pin open circuit.
E1	VSS33RTC	Power	Ground (0 V) for RTC

## LCD Interface

Pin No.	Function Name	I/O	TFT Mode	LCD STN monochr.	LCD STN monochr. (double)	LCD STN color	LCD STN color (bias)
V3	LCDD[17]	O	RED5				
U4	LCDD[16]	O	RED4				
V4	LCDD[15]	O	RED3				
T5	LCDD[14]	O	RED2				
U5	LCDD[13]	O	RED1				
V5	LCDD[12]	O	(RED0)				
R6	LCDD[11]	O	GREEN5				
T6	LCDD[10]	O	GREEN4				
U6	LCDD[9]	O	GREEN3				
V6	LCDD[8]	O	GREEN2				
R7	LCDD[7]	O	GREEN1		DATAHIGH3	DATA7	DATA7
T7	LCDD[6]	O	GREEN0		DATAHIGH2	DATA6	DATA6
U7	LCDD[5]	O	BLUE5		DATAHIGH1	DATA5	DATA5
V7	LCDD[4]	O	BLUE4		DATAHIGH0	DATA4	DATA4
R8	LCDD[3]	O	BLUE3	DATA3	DATALOW3	DATA3	DATA3
T8	LCDD[2]	O	BLUE2	DATA2	DATALOW2	DATA2	DATA2
U8	LCDD[1]	O	BLUE1	DATA1	DATALOW1	DATA1	DATA1
V8	LCDD[0]	O	(BLUE0)	DATA0	DATALOW0	DATA0	DATA0
T10	LCDCLK	O	Byte clock	CL2	CL2	CL2	CL2
V9	LCDCTRL[3]	O	Display off	Display off	Display off	Display off	Display off
U9	LCDCTRL[2]	O	Vsync	FLM	FLM	FLM	FLM
T9	LCDCTRL[1]	O	HSync	CL1	CL1	CL1	CL1
R9	LCDCTRL[0]	O	DVALID			M/Bias	

## SSM Interface

Pin No.	Function Name	I/O	Detail of Function
D12	SSMD[7:0]	I/O	Data lines.
C12			
B12			
A12			
D11			
C11			
B11			
A11			
C10	SSMCLK	O	Clock output.
A13	SSMCMD	O	Command output.
D10	SSMCP	I	Card power input (high = off).
D9	SSMWP	I	Write protect input (low = protect).

## External PLL Pins

Pin No.	Function Name	I/O	Detail of Function
J2	VCO[1:0]	I	External oscillator inputs, typically coming from an external VCO. Together with the external loop-filter and the internal clock dividers, each PDOUT/VCO pair can form a complete PLL.
K2			
J1	PDOUT[1:0]	O	Phase discriminator outputs. These signals are charge-pump type outputs. Each of them can be used to feed the loop-filter of a PLL structure.
K1			

## Global Pins

Pin No.	Function Name	I/O	Detail of Function
D13	NRESET	I	Reset (active low). When asserted, the chip is placed in the reset state and the peripheral pins are configured as inputs. After deassertion of NRESET, the chip is clocked by XTALI and starts booting from the port configured by the FCLE, FALE pins. The NRESET signal must be asserted after power-up.
K3	XTALI	I	Oscillator circuit input. Internal system clock will be derived from XTALI (internal clock multiplier).
J3	XTALO	O	Oscillator circuit output.
C7	RREF	I	Reference current. Connect a 3.0 k-ohms $\pm 1\%$ resistor to GND.
B10	TEST1	I	Reserved. Connect to VDD for normal operation.
A10	HIGHZ	I	Reserved. Connect to VDD for normal operation.
E4	n.c.	-	Pins must be left unconnected (18x).
F4			
G4			
H4			
J4			
V1			
A4			
A5			
B4			
B5			
C8			
C9			

## JTAG Interface

Pin No.	Function Name	I/O	Detail of Function
B15	TMS	I	JTAG mode select.
C14	TCK	I	JTAG clock.
A16	TDI	I	JTAG serial data input.
A15	TDO	O	JTAG serial data output.

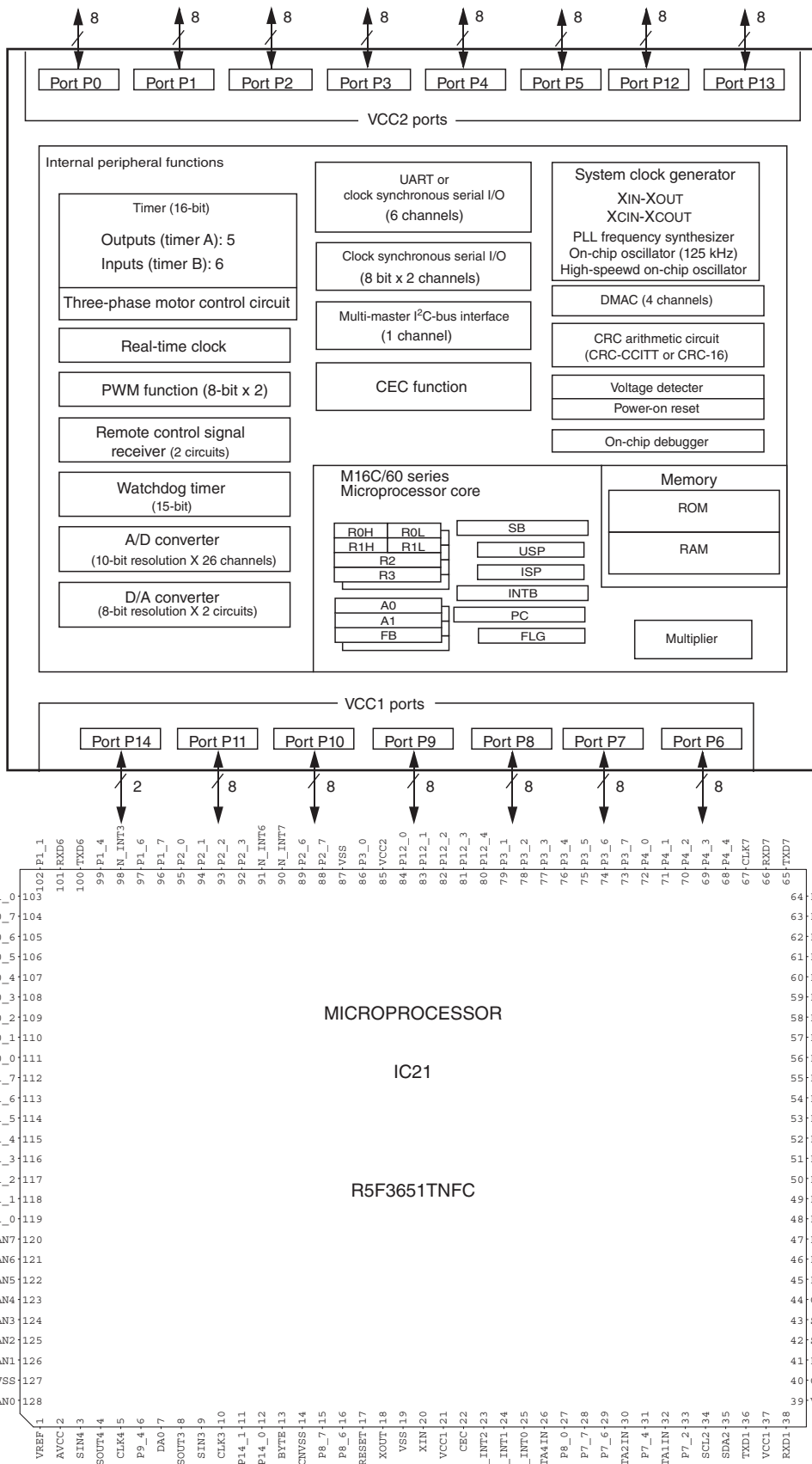
## Power Supply Pins

Pin No.	Function Name	Detail of Function	Pin No.	Function Name	Detail of Function
A6	VDD33	I/O power supply (+3.3 V).	K13	VSS	Ground (0 V).
E8			L6		
E9			L7		
E12			L8		
E13			L9		
F5			L10		
G5			L11		
H14			L12		
J14			L13		
K5			M6		
L5			M7		
M14			M8		
N14			M9		
P6			M10		
P7			M11		
P10			M12		
P11			M13		
D7			N6		
F6			N7		
F7			N8		
F8	N9				
F9	N10				
F10	N11				
F11	N12				
F12	N13				
F13	B6				
G6	C6				
G7	R10	VPP			
G8	A2	VDD33USB	Power supply (+3.3 V) for USB interface. Ground (0 V).		
G9	B2				
G10	A3				
G11	G9	VSS33USB	Power supply (+3.3V) for PLL. Ground (0 V).		
G12	G10	VDD33PLL			
G13	G11	VSS33PLL	VDD12	Power supply (+1.2V).	
H6	H6				
H7	H7				
H8	H8				
H9	H9				
H10	H10				
H11	H11				
H12	H12				
H13	H13				
J6	J6				
J7	J7				
J8	J8				
J9	J9				
J10	J10				
J11	J11				
J12	J12				
J13	J13				
K6	K6				
K7	K7				
K8	K8				
K9	K9				
K10	K10				
K11	K11				
K12	K12				
	D1	VDD12USB	Power supply (+1.2V) for USB interface.		
	C1	VSS12USB	Ground (0 V).		
	H3	VDD12PLL	Power supply (+1.2V) for PLL.		
	H2	VSS12PLL	Ground (0 V).		
	G1	VDD12DCO	Power supply (+1.2V) for DCO.		
	H1	VSS12DCO	Ground (0 V).		

**IC21:** R5F3651TNFC (DIGITAL P.C.B.)

Microprocessor

\* No replacement part available.



MICROPROCESSOR

IC21

R5F3651TNFC

R-N500

Pin No.	Port Name	Function Name (P.C.B.)	I/O				Detail of Function
			FULL ON	POWER OFF	MCU SLEEP	AC OFF	
1	VREF	VREF	MCU	MCU	MCU	MCU	AD standard voltage
2	AVCC	AVCC	MCU	MCU	MCU	MCU	Microprocessor power supply
3	SIN4	EEP_MISO	SI	SI	O	SI	EEPROM / Expansion Flash synchronization data input
4	SOUT4	EX_MOSI	SO	SO	O	SO	FL driver / EEPROM / Expansion Flash synchronization data output
5	CLK4	EX_SCK	SO	SO	O	SO	FL driver / EEPROM / Expansion Flash synchronous clock output
6	P9_4	+5EX_PON	O	O	O	O	
7	DA0	AMP_LMT	DA	O	O	O	Limiter control output
8	SOUT3	(no_use)	O	O	O	O	
9	SIN3	(no_use)	O	O	O	O	
10	CLK3	(no_use)	O	O	O	O	
11	P14_1	(no_use)	O				
12	P14_0	TUN_N_RST	O	O	O	O	Tuner reset
13	BYTE	BYTE	MCU	MCU	MCU	MCU	Data bus width reshuffling input / When in single chip mode: L (16 bit)
14	CNVSS	E8A_CNVSS	MCU	MCU	MCU	MCU	Processor mode select / Low: Single chip mode
15	P8_7	(no_use)	O	O	O	O	
16	P8_6	DIAG_FCT	O	O	O	O	Diag OK: Output High / Diag NG: Output Low (default)
17	/RESET	CPU_N_RST	MCU	MCU	MCU	MCU	Reset input
18	XOUT	XOUT	MCU	MCU	MCU	MCU	Oscillation circuit output
19	VSS	DGND	MCU	MCU	MCU	MCU	Microprocessor ground
20	XIN	XIN	MCU	MCU	MCU	MCU	Oscillation circuit input
21	VCC1	+3.3M	MCU	MCU	MCU	MCU	Microprocessor power supply
22	CEC	(no_use)	I	I	I	I	
23	N_INT2	(no_use)	I	I	I	I	
24	N_INT1	(no_use)	I	I	I	I	
25	N_INT0	(no_use)	I	I	I	I	
26	TA4IN	DIR_N_INT	TMR	I	O	I	DIR interrupt input
27	P8_0	DRCT_LED	O	O	O	O	
28	P7_7	DIR_N_RST	O	O	O	O	DIR reset / UART5 unusable because CEC function is used
29	P7_6	DIR_N_CS	O	O	O	O	DIR chip select / UART5 unusable because CEC function is used
30	TA2IN	TUN_N_INT	TMR	O	O	O	Tuner GPIO2 input / Silicone tuner interrupt input
31	P7_4	NCPU_SPI_REQ	I	I	I	I	NET SPI request
32	TA1IN	ACPWR_DET	TMR	I+	I+	I+	AC power detection / L: Power down
33	P7_2	NCPU_SPI_RDY	I	I	I	I	NET SPI ready
34	SCL2		I	I	I	I	
35	SDA2		I	I	I	I	
36	TXD1	E8A_TXD	SO	SO	I+	I+	
37	VCC1	+3.3M	MCU	MCU	MCU	MCU	Microprocessor power supply
38	RXD1	E8A_RXD	SI	SI	I+	I+	
39	VSS	DGND	MCU	MCU	MCU	MCU	Microprocessor ground
40	CLK1	E8A_SCLK	SI	SI	I+	I+	
41	P6_4	E8A_BUSY	I-	I-	I-	I-	
42	SDA0	TUN_SDA	SI	O	O	O	Tuner I2C, Apple co-processor synchronization data input and output / also used for debugging firmware, UART TXD when debugging
43	SCL0	TUN_SCL	SO	O	O	O	Tuner I2C, Apple co-processor synchronous clock output / also used for debugging firmware, UART RXD when debugging
44	P6_1	PDSW	I	O	O	O	
45	P6_0	Z2_LED	O	O	O	O	
46	P13_7	VOL_MOSI	O	O	O	O	Electronic volume flip-flop synchronization data output
47	P13_6	VOL_SCK	O	O	O	O	Electronic volume flip-flop synchronous clock output
48	P13_5	I_PRT	I-	I-	I-	I-	Overcurrent protection detection
49	P13_4	TRANS_RY	O	O	O	O	Transformer coil selection H: ACL, L: ACH
50	P5_7	DCDC_PON	O	O	O	O	
51	P5_6	MT_N_SW	O	O	O	O	Mute control (Subwoofer)
52	P5_5	E8A_N_EPM	I-	I-	I-	I-	
53	P5_4	HP_N_DET	I+	O	O	O	Headphone detection / L: Headphone detected

Pin No.	Port Name	Function Name (P.C.B.)	I/O				Detail of Function
			FULL ON	POWER OFF	MCU SLEEP	AC OFF	
54	P13_3	HPRY	O	O	O	O	Headphone relay control
55	P13_2	SPRY_B (SPRY_SB_BA)	O	O	O	O	Speaker relay control (SP B)
56	P13_1	(no_use)					
57	P13_0	SPRY_5CH	O	O	O	O	Speaker relay control (Front/Center/Sorround)
58	P5_3	MT_N_Z2 (MT_N_SB)	O	O	O	O	Mute control (Zone2)
59	P5_2	SEL_NDAC	O	O	O	O	L: Bco output / H: No input * When Zone2 is set: L, Others: H
60	P5_1	MT_N_5CH	O	O	O	O	Mute control (Front/Center/Sround)
61	P5_0	E8A_N_CE	I+	I+	I+	I+	
62	P12_7	OSDFS_N_CS	O	O	O	O	Chip select control of OSD Flash from microprocessor
63	P12_6	USB_VBUS_PON	O	O	O	O	
64	P12_5	PRY	O	O	O	O	Power relay control / H: On
65	TXD7	(no use)	O	O	O	O	
66	RXD7	(no use)	O	O	O	O	
67	CLK7	(no use)	O	O	O	O	
68	P4_4	REM_OUT	O	O	O	O	Remote control code (spare)
69	P4_3	IN_RD	I+	I+	I+	I+	Input selector encoder B
70	P4_2	IN_RC	I+	I+	I+	I+	Input selector encoder A
71	P4_1	N_FCT	I	I	I	I	FCT detection / H: Product mode, L: FCT mode
72	P4_0	NDAC_N_MT	O	O	O	O	Mute control
73	P3_7	OSDFS_BUS_SEL	O	O	O	O	OSD Flash SPI connection selection between microprocessor SPI and HDMI OSD SPI L: ROHM/FPGA SPI, H: Spalta OSD SPI
74	P3_6	VOL_RB	I+	I+	I+	I+	Volume rotary encoder B
75	P3_5	VOL_RA	I+	I+	I+	I+	Volume rotary encoder A
76	P3_4	FLD_N_CS	O	O	O	O	FL driver chip select
77	P3_3	FLD_N_RST	O	O	O	O	FL driver reset
78	P3_2	MIC_N_DET	I-	I-	I-	I-	MIC detection / L: MIC detected
79	P3_1	STBY_LED	O	O	O	O	Standby through LED / H: LED lighting
80	P12_4	NCPU_PON	O	O	O	O	H: Power supply ON
81	P12_3	DSP_PON	O				H: Power supply ON
82	P12_2	+3.3S_PON	O				H: Power supply ON
83	P12_1	(no_use)	O	O	O	O	
84	P12_0	(no_use)	O	O	O	O	
85	VCC2	VCC2	MCU	MCU	MCU	MCU	Microprocessor power supply
86	P3_0	EED_N_CS	O	O	O	O	EEPROM chip select
87	VSS	VSS	MCU	MCU	MCU	MCU	Microprocessor ground
88	P2_7	MODE	I+	I+	I+	I+	+3.3V: Normal movement / OV: MAC address writing permission
89	P2_6	USB_BUSY					(reserved)
90	N_INT7	REM_IN	IRQ	IRQ	IRQ	I	Remote control pulse input
91	N_INT6	PSW_N_DET	IRQ	IRQ	IRQ	I	Power system switch (Power, Scene) detection L: Standby key ON
92	P2_3	(no_use)	O	O	O	O	
93	P2_2	(no_use)	O	O	O	O	
94	P2_1	(no_use)	O	O	O	O	
95	P2_0	(no_use)	O	O	O	O	
96	P1_7	PWM_PDN (reserved)	O	O	O	O	Digital amplifier power down control
		NET_RF (PWM_PDN)	I+	I+	I+	I+	Net selector encoder B
97	P1_6	NCPU_VBUSDRV	I-	I-	I-	I-	USB power supply output requirement from NETWORK microprocessor
98	N_INT3	MHL_WAKE					(reserved)
99	P1_4	NET_RE (PWM_N_RST)	I+	I+	I+	I+	Net selector encoder A
100	TXD6	NCPU_SPI_MOSI	SO	O	O	O	NET SPI data output
101	RXD6	NCPU_SPI_MISO	SI	O	O	O	NET SPI data input
102	CLK6	NCPU_SPI_SCK					NET SPI clock output
103	P1_0	NCPU_SPI_N_CS	O	O	O	O	NET SPI chip select



Pin No.	Port Name	Function Name (P.C.B.)	I/O				Detail of Function
			FULL ON	POWER OFF	MCU SLEEP	AC OFF	
104	P0_7	DAC_N_CS	O	O	O	O	DAC chip select
105	P0_6	NCPU_AMUTE	I	O	O	O	NET audio mute demand
106	AN0_5	PS3_PRT	AD				PS protection detection 3
107	AN0_4	PS2_PRT	AD				PS protection detection 2
108	AN0_3	(reserve)	AD				AD spare
109	AN0_2	USB_VBUS_PRT	AD	I	I	I	USB iPad power supply feedback
110	AN0_1	THM3	AD	I	I	I	Temperature detection 3 / near diode bridge heat sinking plate (NTC thermister) of MAIN P.C.B.
111	AN0_0	DEST	AD	I	I	I	Model distinction
112	P11_7	NCPU_N_RST	O	O	O	O	
113	P11_6	DIR_SDO	I	I	O	I	DIR_SDO input for CDDA writing
114	P11_5	DIR_WCK	I	I	O	I	DIR_WCK input for CDDA writing
115	P11_4	TUNI2C_ON	O	O	O	O	(reserved) / I2C switching to Tuner
116	P11_3	VO_N_MT	O	O	O	O	Composite video selector mute
117	P11_2	VSEL3	O	O	O	O	Select of video input
118	P11_1	VSEL2	O	O	O	O	Select of video input
119	P11_0	VSEL1	O	O	O	O	Select of video input
120	AN7	DC_PRT	AD	I	I	I	Power amplifier DC detection
121	AN6	AMP_OLV	AD	I	I	I	Power amplifier output level detection
122	AN5	THM1	AD	I	I	I	Temperature detection 1
123	AN4	THM2	AD	I	I	I	
124	AN3	KEY2	AD	I	I	I	KEY AD value uptake 2
125	AN2	KEY1	AD	I	I	I	KEY AD value uptake 1
126	AN1	PS1_PRT	AD	I	I	I	PS protection detection 1
127	AVSS	AVSS	MCU	MCU	MCU	MCU	Microprocessor ground
128	P10_0	(no_use)	O	O	O	O	AD spare

FULL ON : During normal operation  
 POWER OFF : During transition from normal operation to standby state  
 MCU SLEEP : Standby state  
 AC OFF : During transition from normal operation to AC off

Key detection for A/D port  
 Key input (A/D) pull-up resistance: 10 k-ohms

	0 Ω	+1 kΩ	+1 kΩ	+1.5 kΩ	+1.8 kΩ	+2.2 kΩ	+3.3 kΩ	+4.7 kΩ
Detected voltage value at 125 pin	0 – 0.14 V	0.16 – 0.41 V	0.43 – 0.7 V	0.71 – 1 V	1.01 – 1.27 V	1.28 – 1.55 V	1.57 – 1.85 V	1.86 – 2.14 V
A/D value (3.3 V=255)	000 – 011	012 – 032	033 – 054	055 – 077	078 – 098	099 – 120	121 – 143	144 – 165
KEY1	ENTER	RETURN	TUNING >>	TUNING <<	AM	FM	PRESET >	PRESET <

	0 Ω	+1 kΩ	+1 kΩ	+1.5 kΩ	+1.8 kΩ	+2.2 kΩ
Detected voltage value at 124 pin	0 – 0.14 V	0.16 – 0.41 V	0.43 – 0.7 V	0.71 – 1 V	1.01 – 1.27 V	1.28 – 1.55 V
A/D value (3.3 V=255)	000 – 011	012 – 032	033 – 054	055 – 077	078 – 098	099 – 120
KEY2	CLEAR	MEMORY	DISPLAY	DIMMER	SPEAKERS A	SPEAKERS B

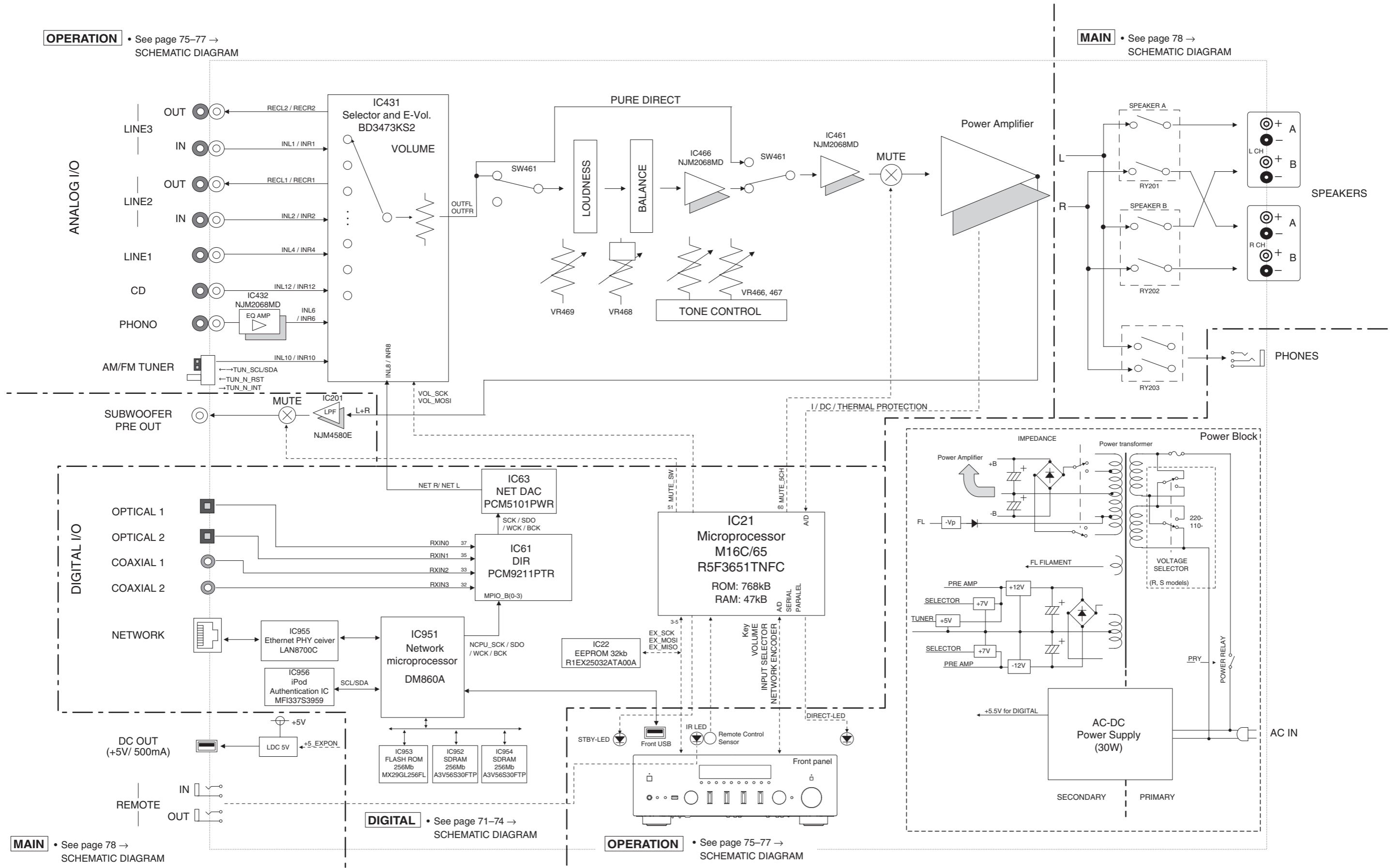
Destination detection for A/D port  
 Pull-up resistance: 10 k-ohms

R5418 on OPERATION (2) P.C.B.	0 Ω	1.2 kΩ	2.7 kΩ	4.7 kΩ	6.8 kΩ	10 kΩ	15 kΩ	47 kΩ	100 kΩ
Detected voltage value at 111 pin	0 – 0.16 V	0.17 – 0.51 V	0.52 – 0.85 V	0.86 – 1.18 V	1.19 – 1.48 V	1.49 – 1.80 V	1.81 – 2.20 V	2.58 – 2.87 V	2.88 – 3.16 V
A/D value (3.3 V=255)	000 – 012	013 – 039	040 – 066	067 – 091	092 – 114	115 – 139	140 – 170	199 – 222	223 – 244
DEST		U	C	R, S		K	A	B, G	L

# BLOCK DIAGRAMS

**OPERATION** • See page 75-77 → SCHEMATIC DIAGRAM

**MAIN** • See page 78 → SCHEMATIC DIAGRAM



1

### Power Supply Section Block Diagram

2

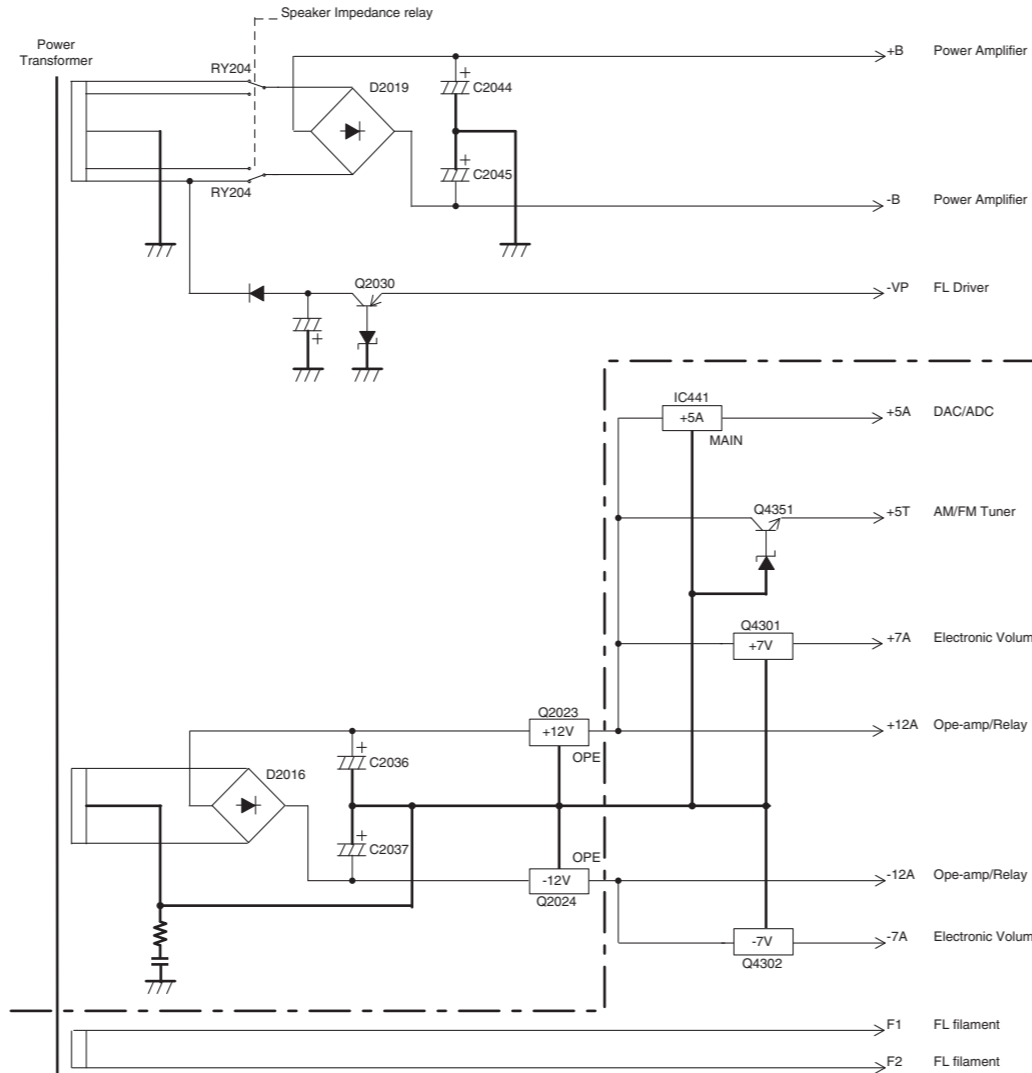
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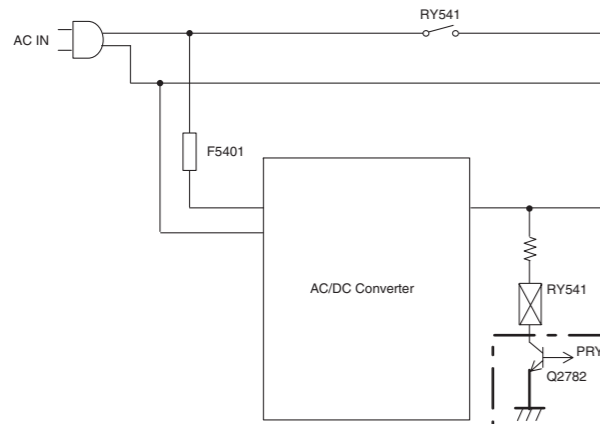
6

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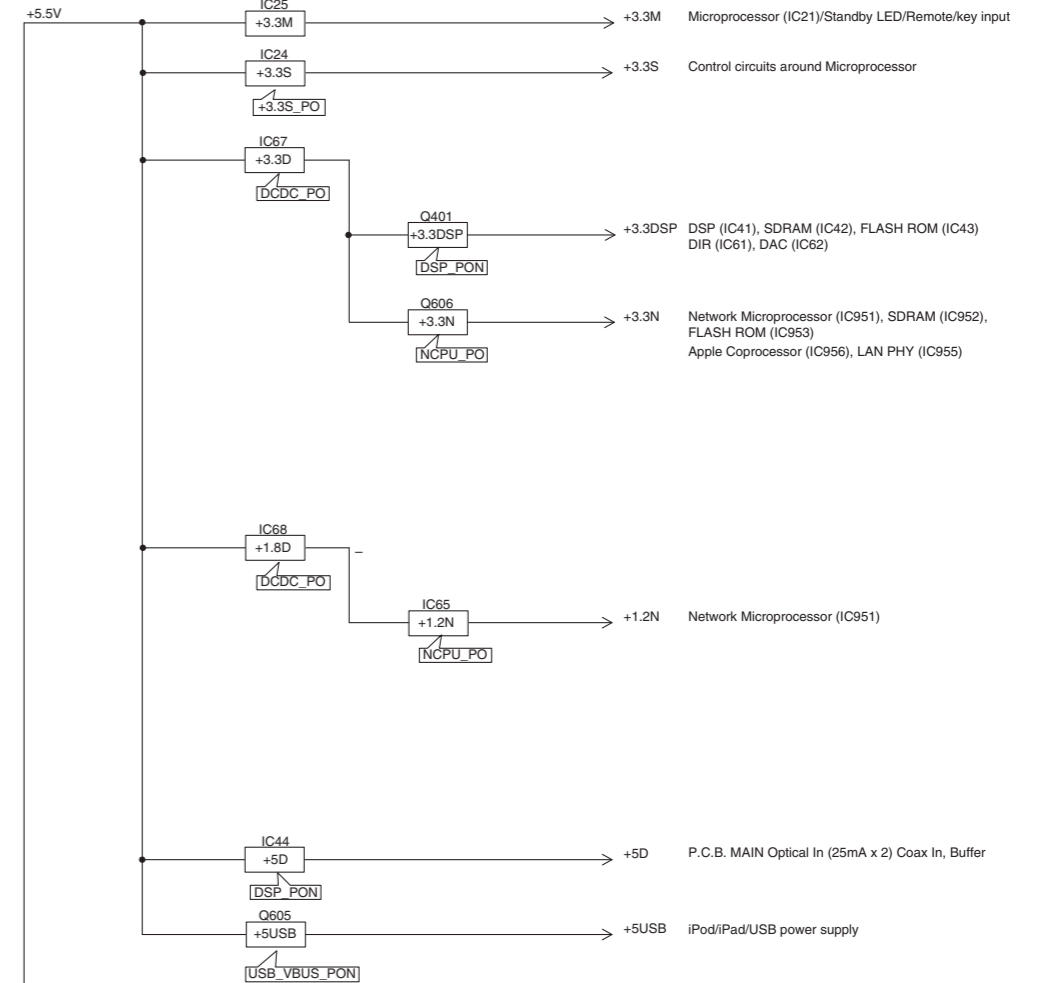


**MAIN** • See page 78 → SCHEMATIC DIAGRAM

**OPERATION** • See page 75-77 → SCHEMATIC DIAGRAM



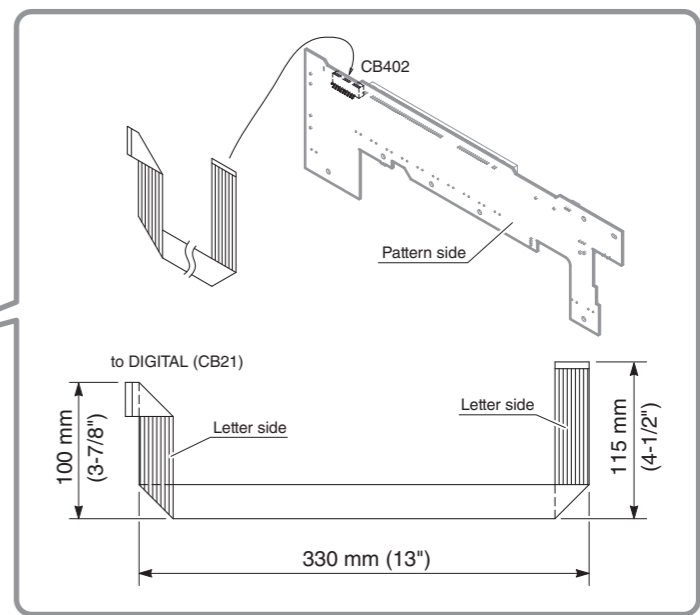
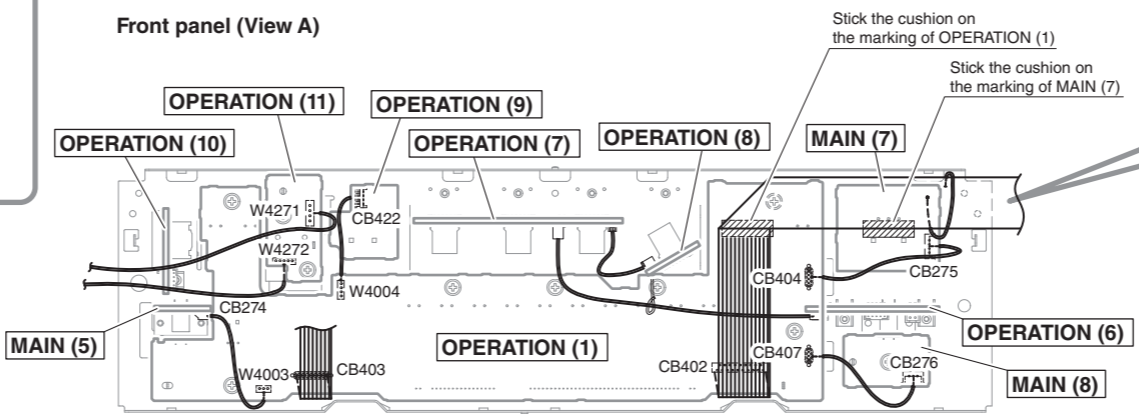
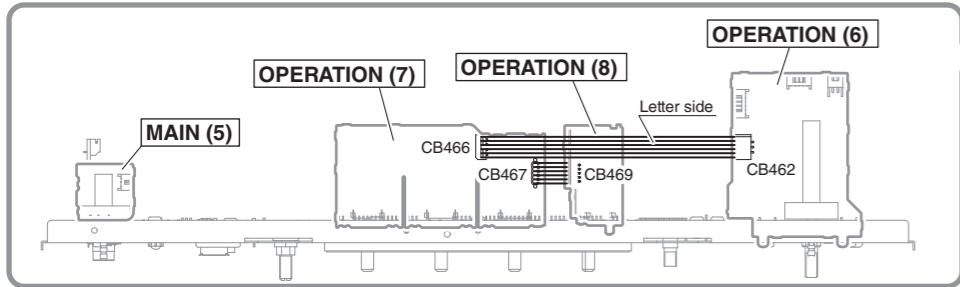
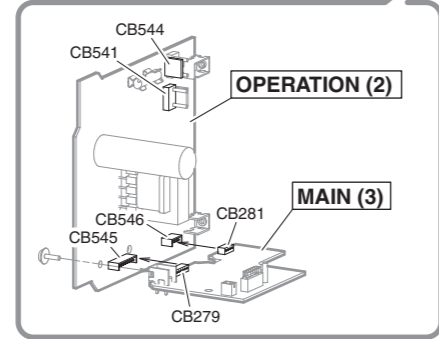
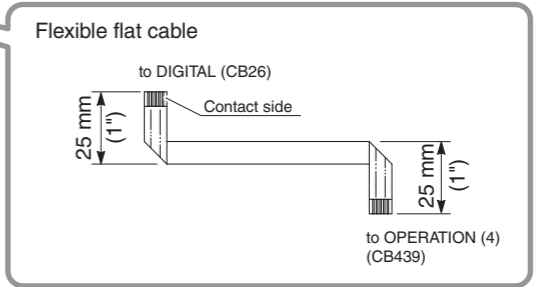
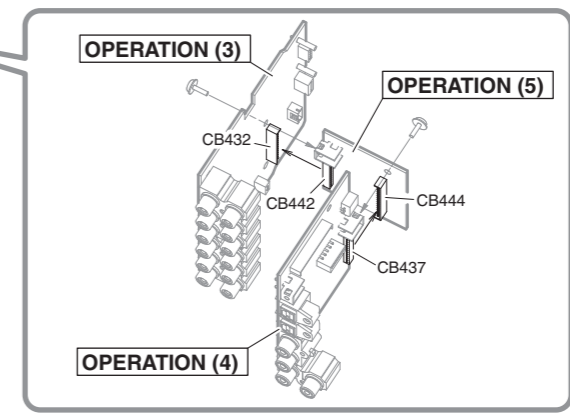
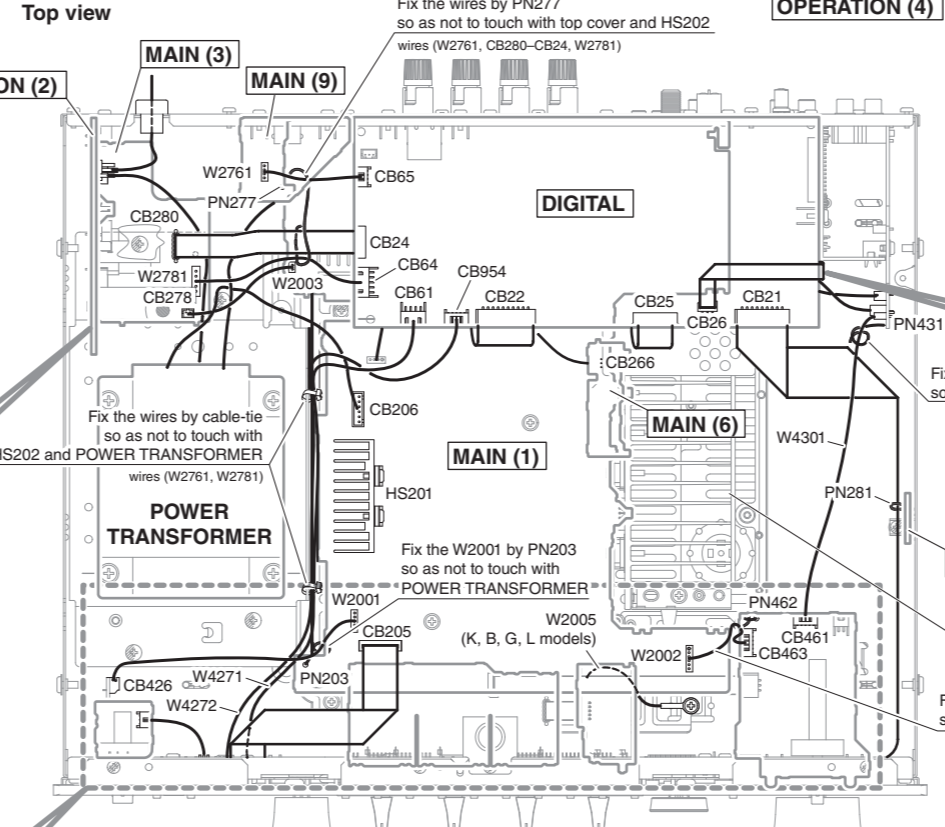
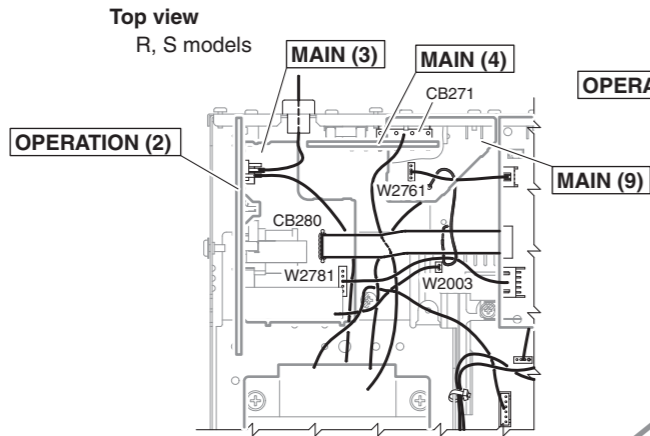
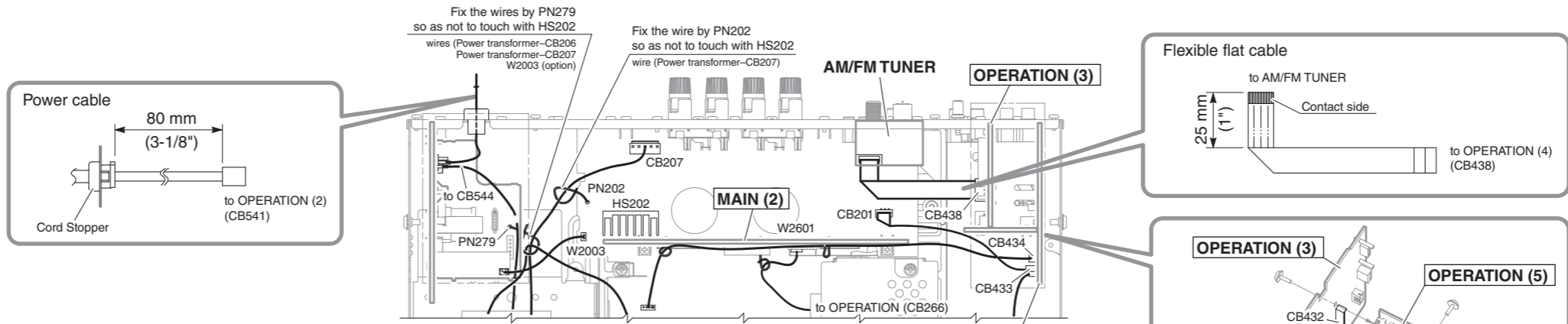
**MAIN** • See page 78 → SCHEMATIC DIAGRAM



**DIGITAL** • See page 71-74 → SCHEMATIC DIAGRAM

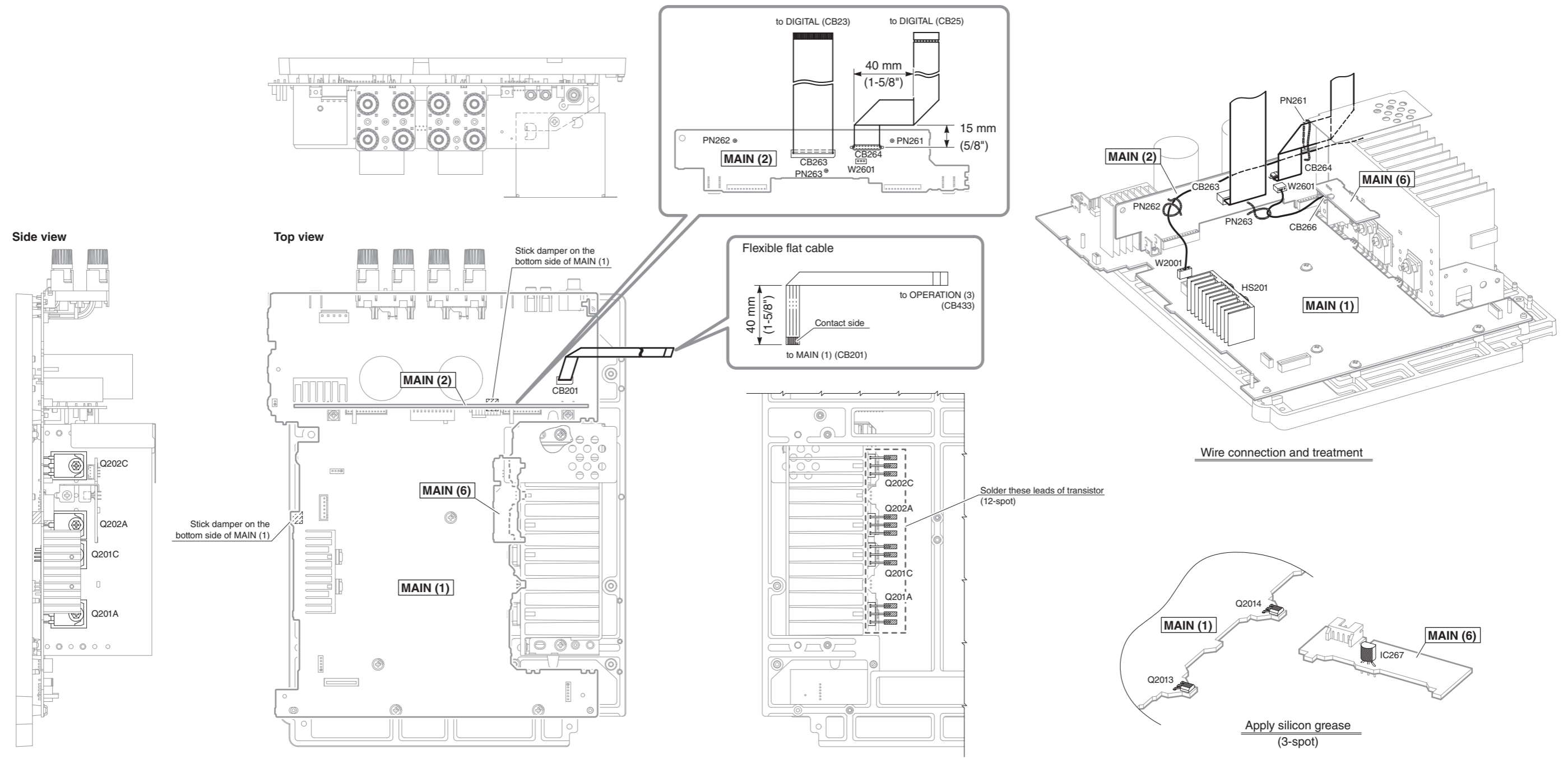
# WIRING DIAGRAMS

- OVERALL ASSEMBLY



1  
2  
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• AMP UNIT



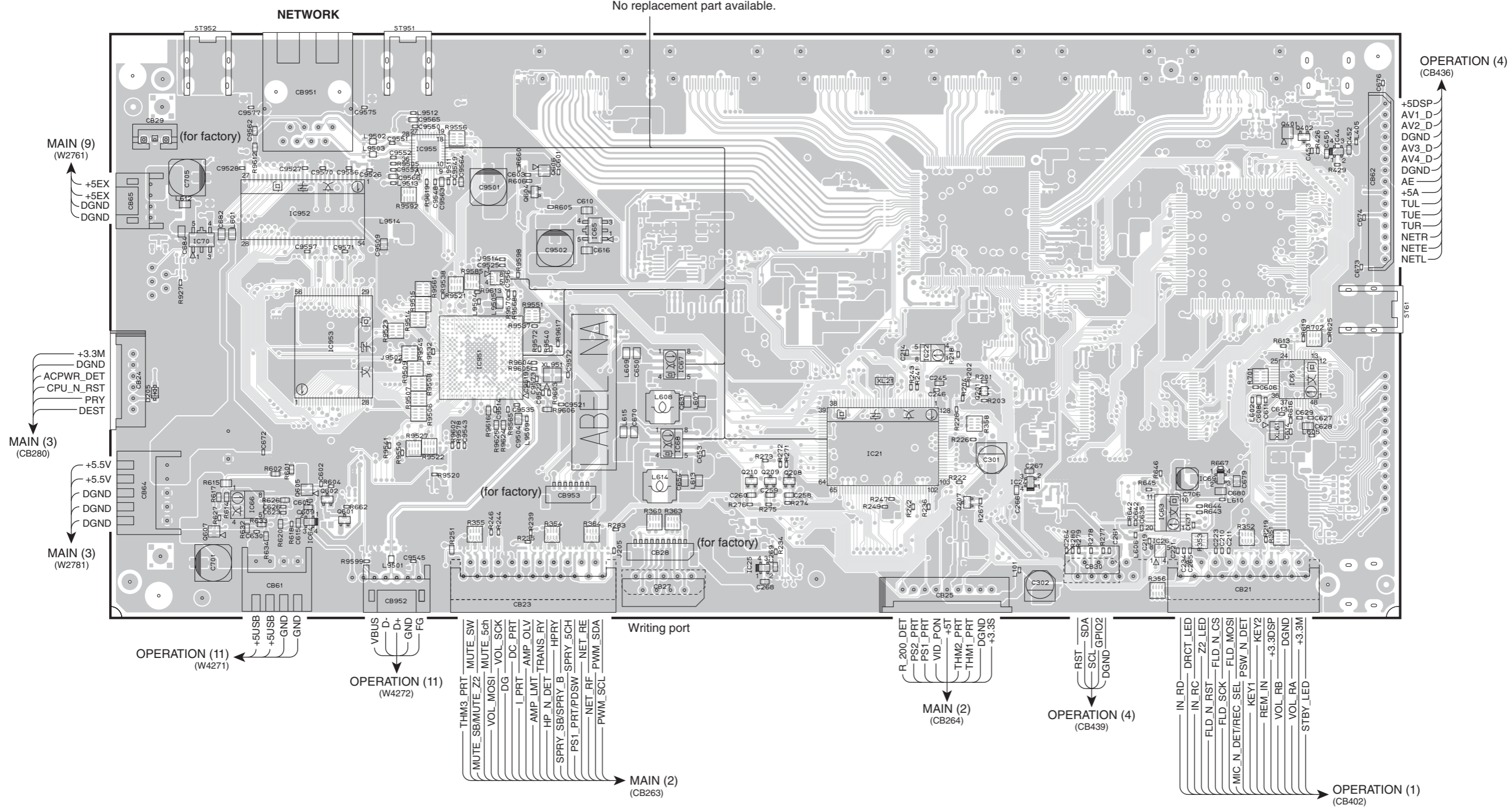
PRINTED CIRCUIT BOARDS

DIGITAL (Side A)

• Semiconductor Location

Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location	Ref no.	Location
D205	B4	IC61	I4	IC69	H5	Q201	G4	Q601	C5
IC21	F5	IC63	H5	IC70	B4	Q207	G4	Q602	C5
IC22	G4	IC64	C5	IC951	D4	Q208	F5	Q604	D3
IC24	G4	IC65	E3	IC952	C3	Q209	F5	Q605	C5
IC25	F5	IC66	C5	IC953	C4	Q210	F5	Q606	D3
IC26	H5	IC67	E4	IC955	D3	Q401	I3	Q607	B5
IC44	I3	IC68	E5	IC956	D4	Q402	I3		

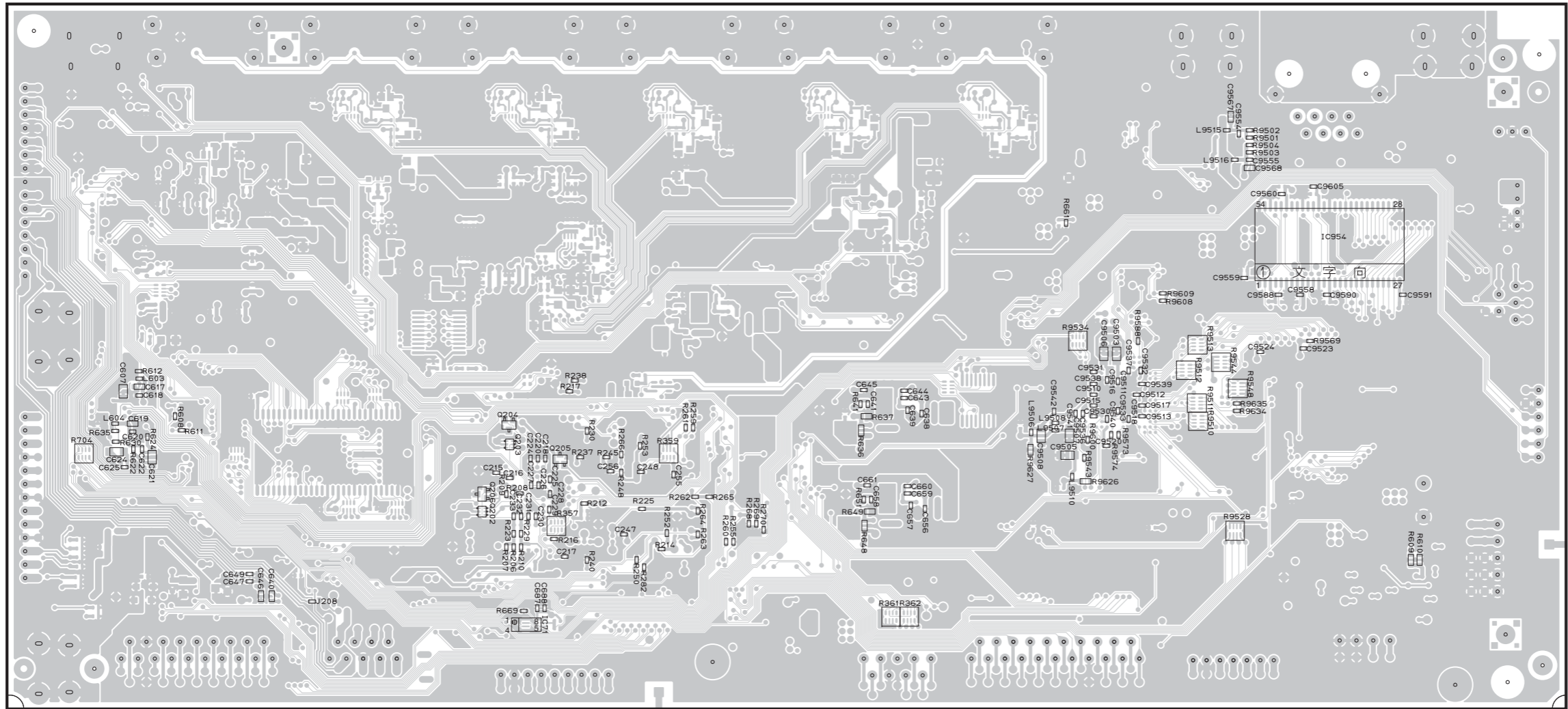
No replacement part available.



- +5DSP
- AV1\_D
- AV2\_D
- DGND
- AV3\_D
- AV4\_D
- DGND
- AE
- +5A
- TUL
- TUE
- TUR
- NETR
- NETE
- NETL

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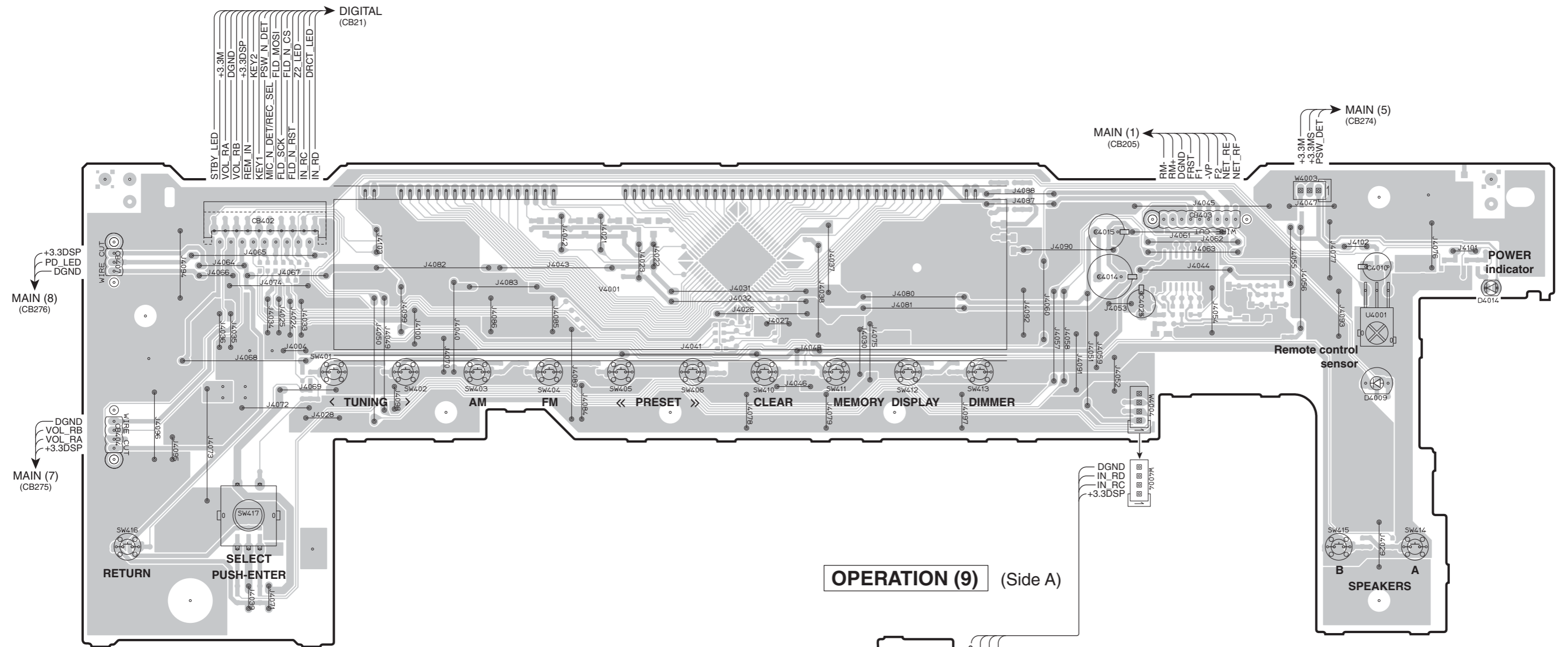
**DIGITAL** (Side B)



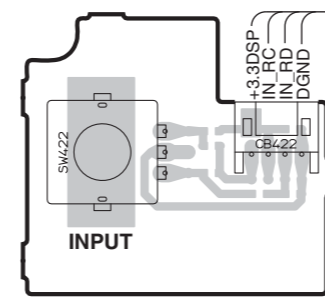
• Semiconductor Location

Ref no.	Location
IC71	D5
IC954	H3
Q202	D5
Q203	D4
Q204	D4
Q205	D5
Q206	D5

**OPERATION (1)** (Side A)



**OPERATION (9)** (Side A)



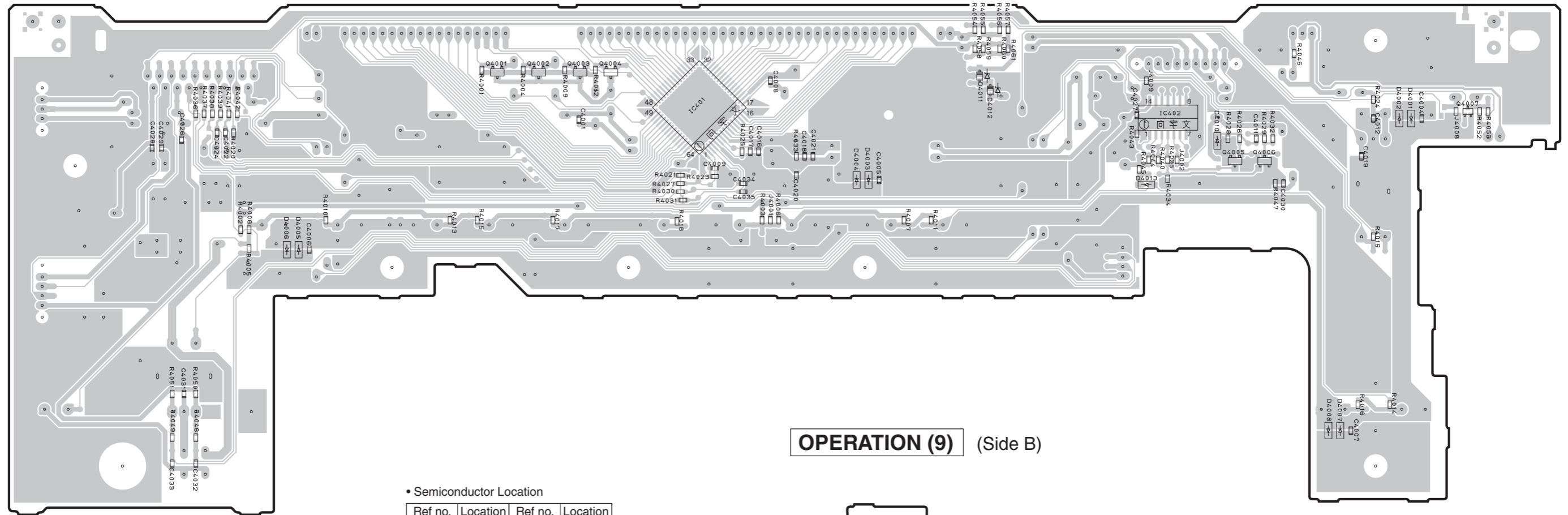
• Semiconductor Location

Ref no.	Location
D4009	I4
D4014	J3

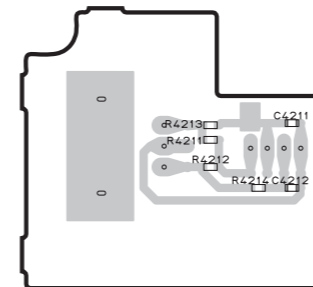


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**OPERATION (1)** (Side B)



**OPERATION (9)** (Side B)



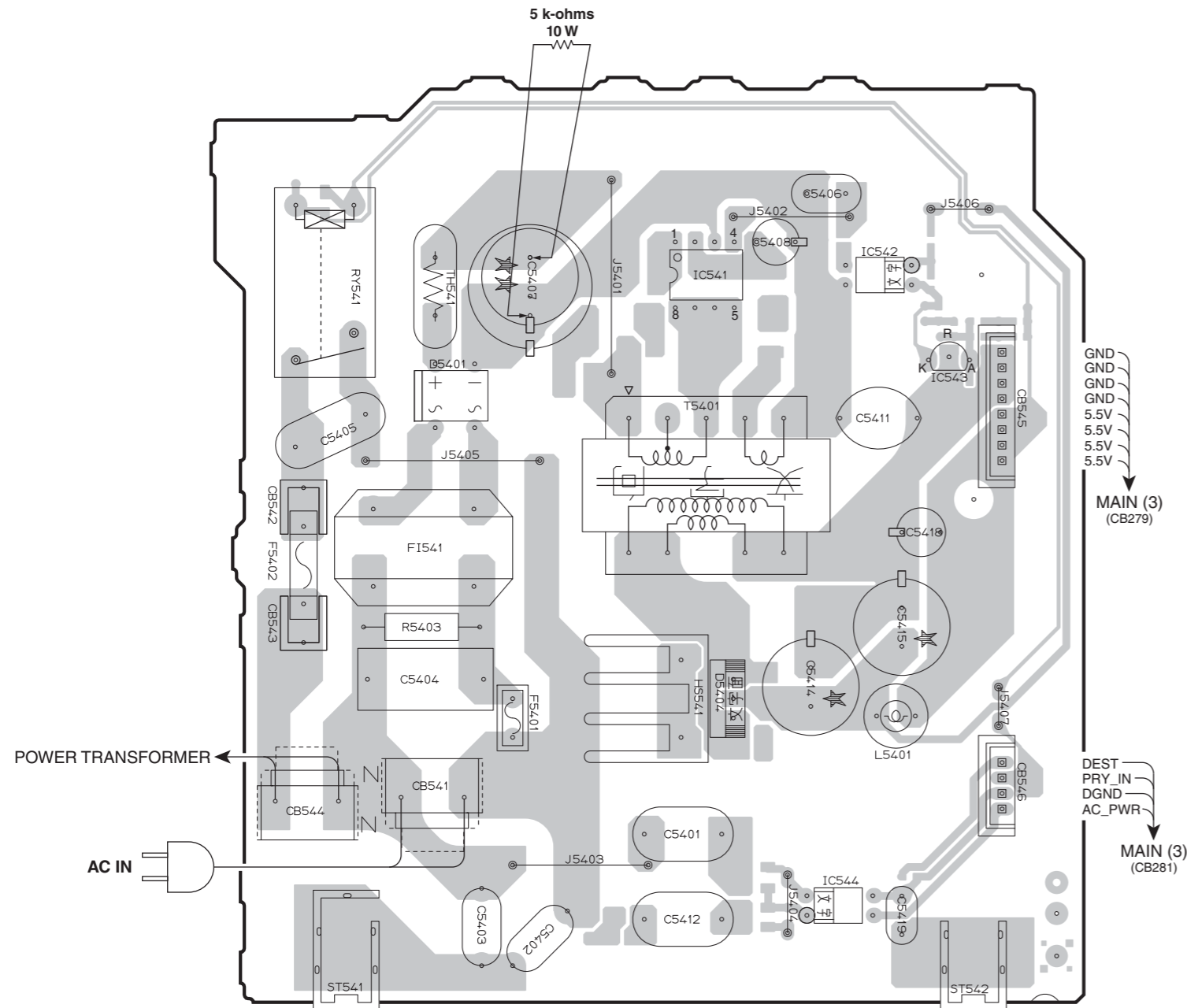
• Semiconductor Location

Ref no.	Location	Ref no.	Location
D4001	I3	D4013	H4
D4002	I3	IC401	E3
D4003	F4	IC402	H3
D4004	F4	Q4001	D3
D4005	C6	Q4002	D3
D4006	C6	Q4003	D3
D4007	I5	Q4004	E3
D4008	I5	Q4005	H4
D4010	H3	Q4006	H4
D4011	G3	Q4007	J3
D4012	G3		

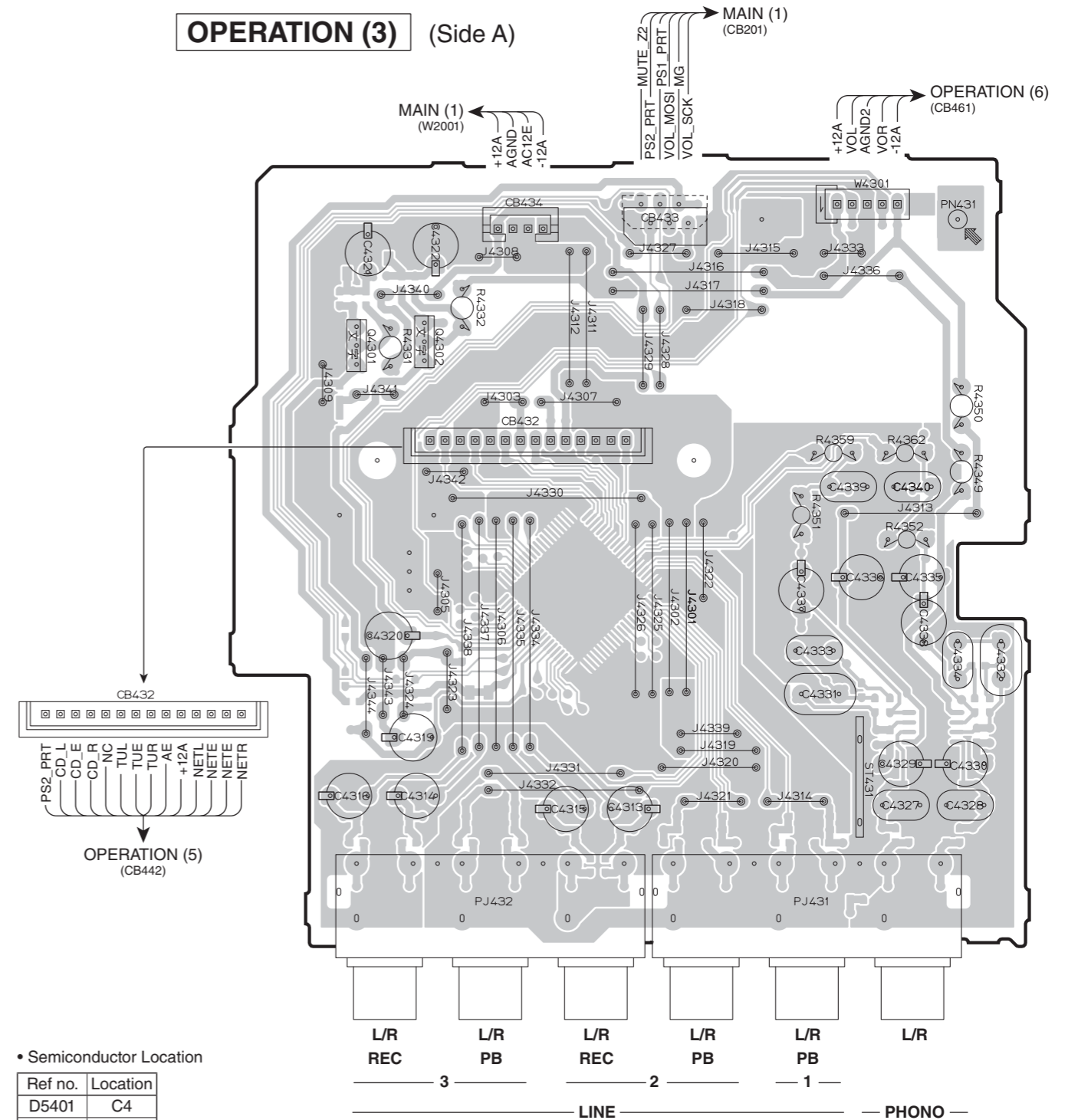
**Safety measures**

- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there. Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity. The time required for discharging is about 30 seconds per each. C5407 on OPERATION (2) P.C.B.

**OPERATION (2) (Side A)**



**OPERATION (3) (Side A)**



• Semiconductor Location

Ref no.	Location
D5401	C4
D5404	D5
IC541	D3
IC542	E2
IC543	E4
IC544	D6
Q4301	G3
Q4302	H3

1

**OPERATION (2)** (Side B)

2

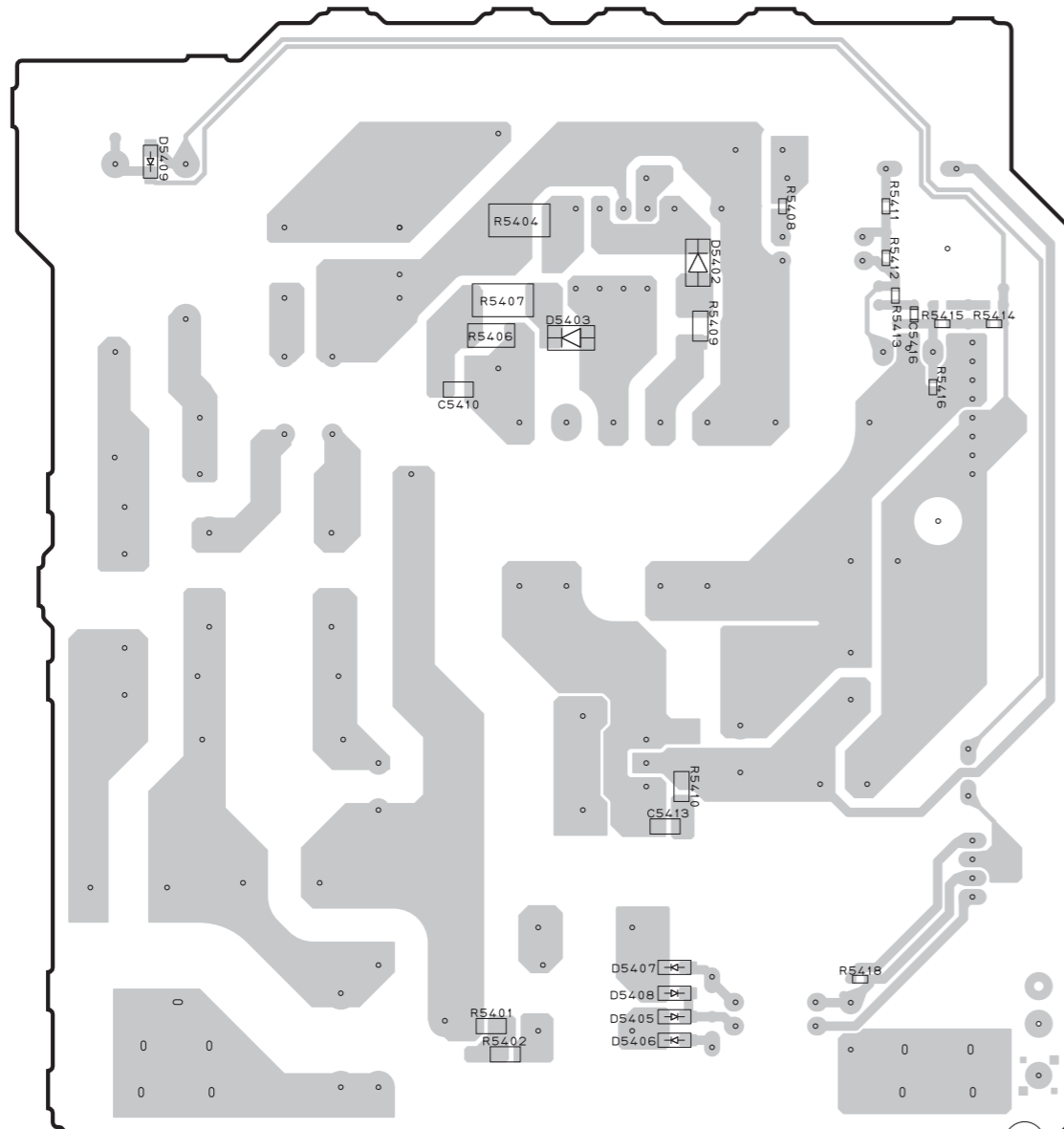
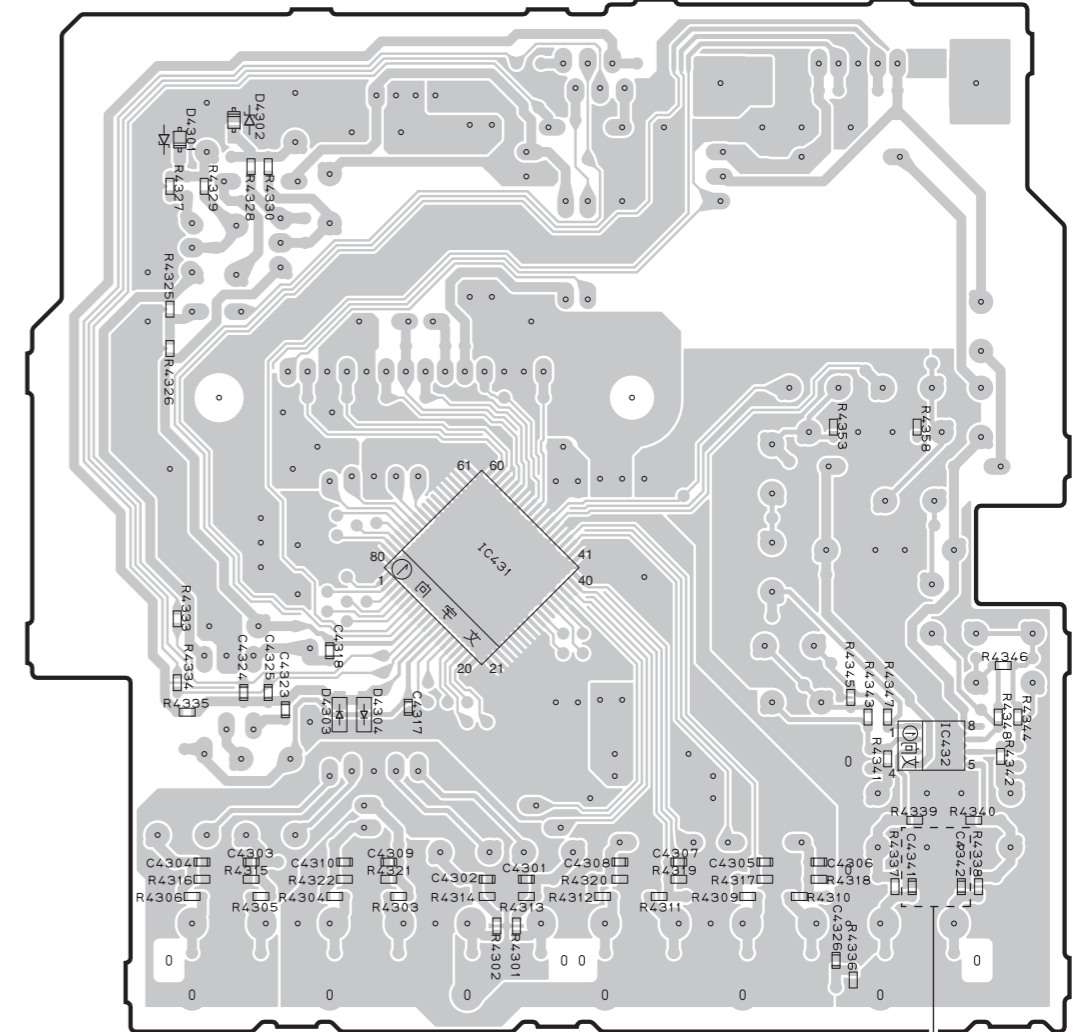
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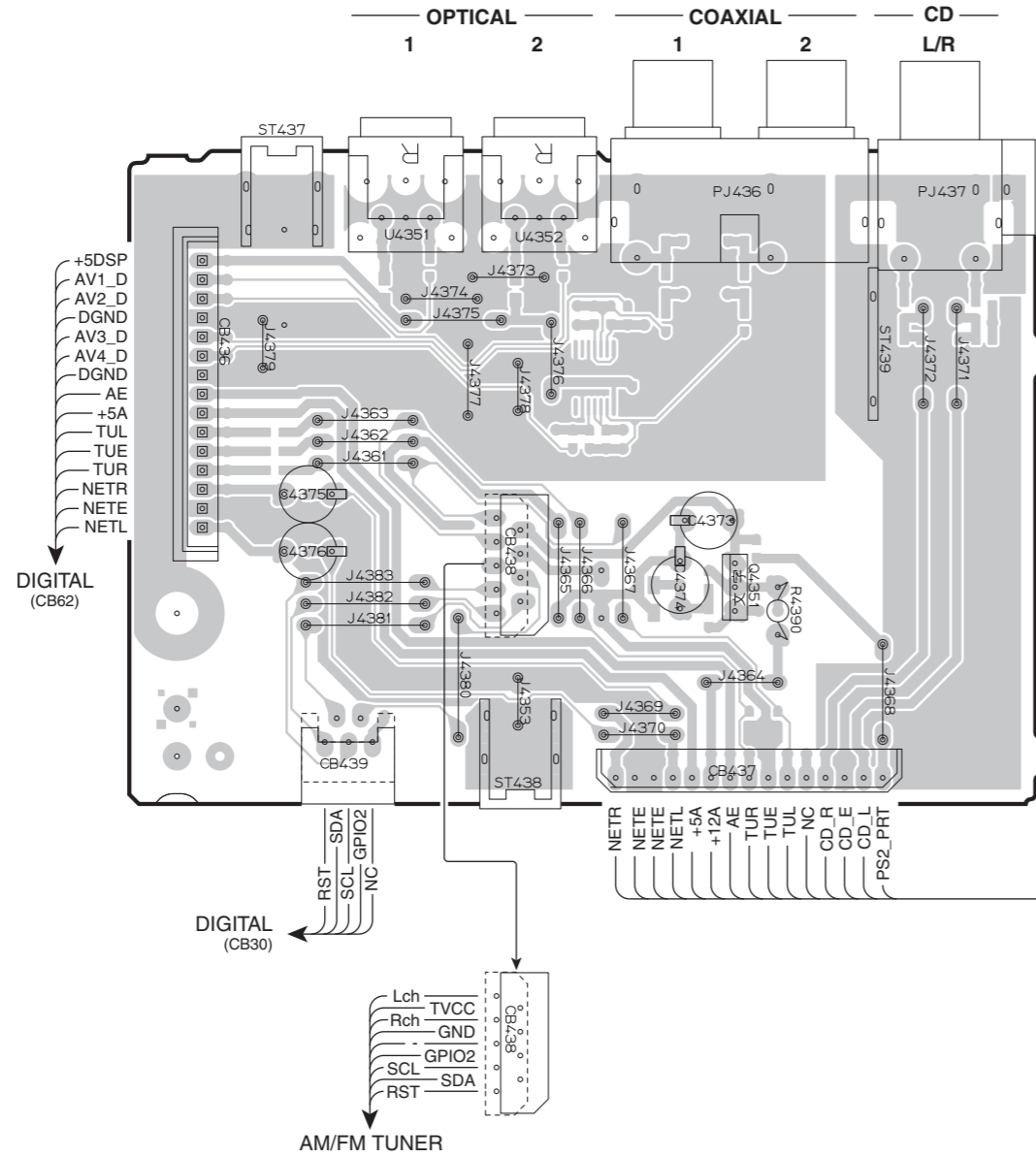
**OPERATION (3)** (Side B)

## • Semiconductor Location

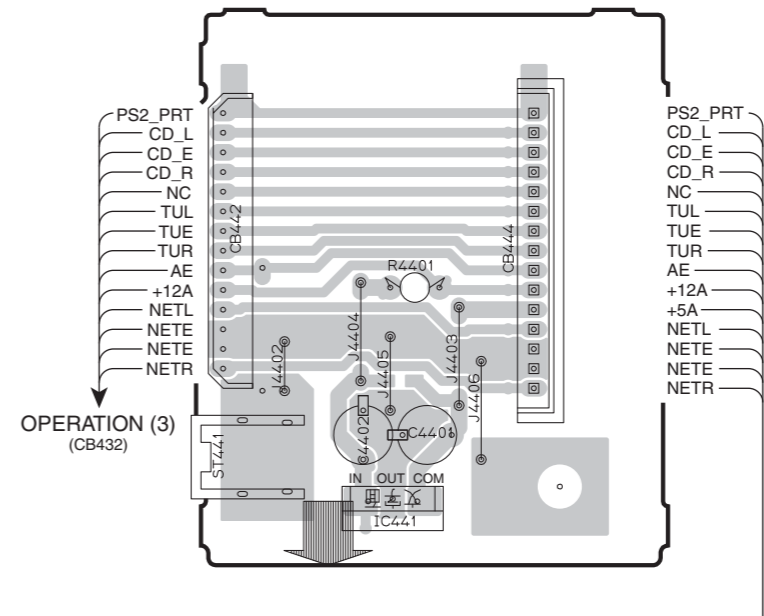
Ref no.	Location
D4301	G3
D4302	G3
D4303	G5
D4304	G5
D5402	D3
D5403	C3
D5405	C6
D5406	C6
D5407	C6
D5408	C6
D5409	B3
IC431	H1
IC432	I5

K, A, B, G, L models

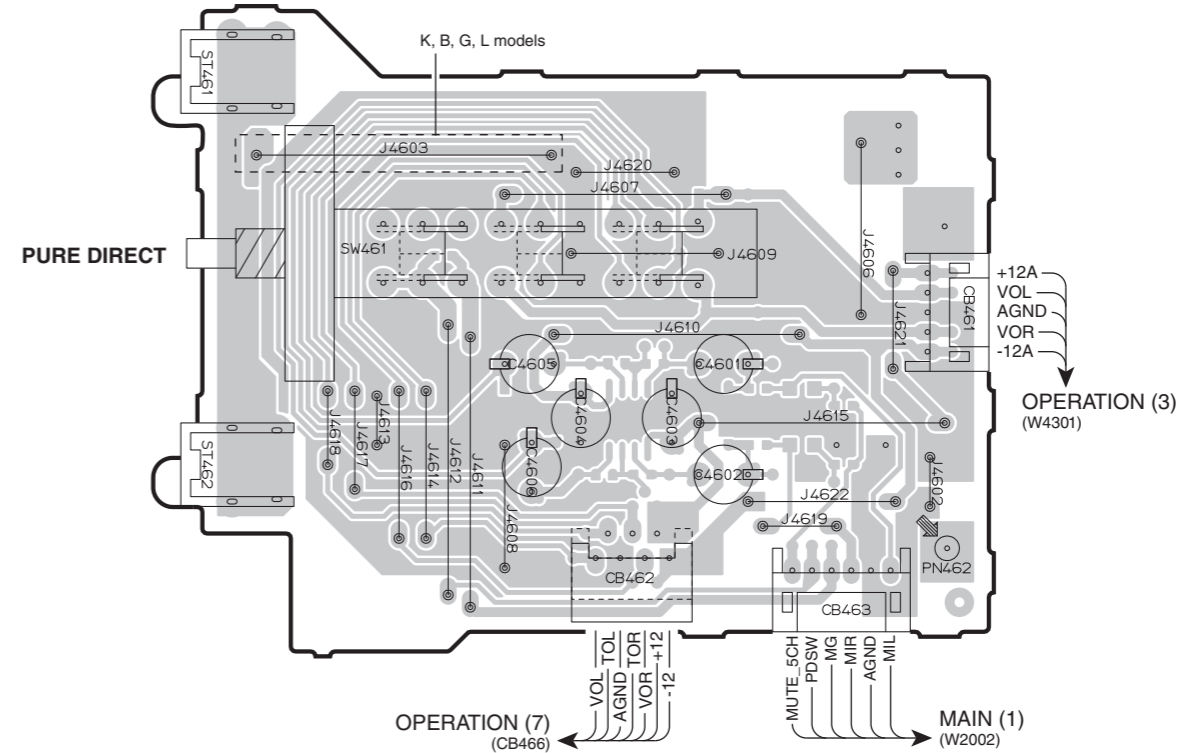
**OPERATION (4)** (Side A)



**OPERATION (5)** (Side A)



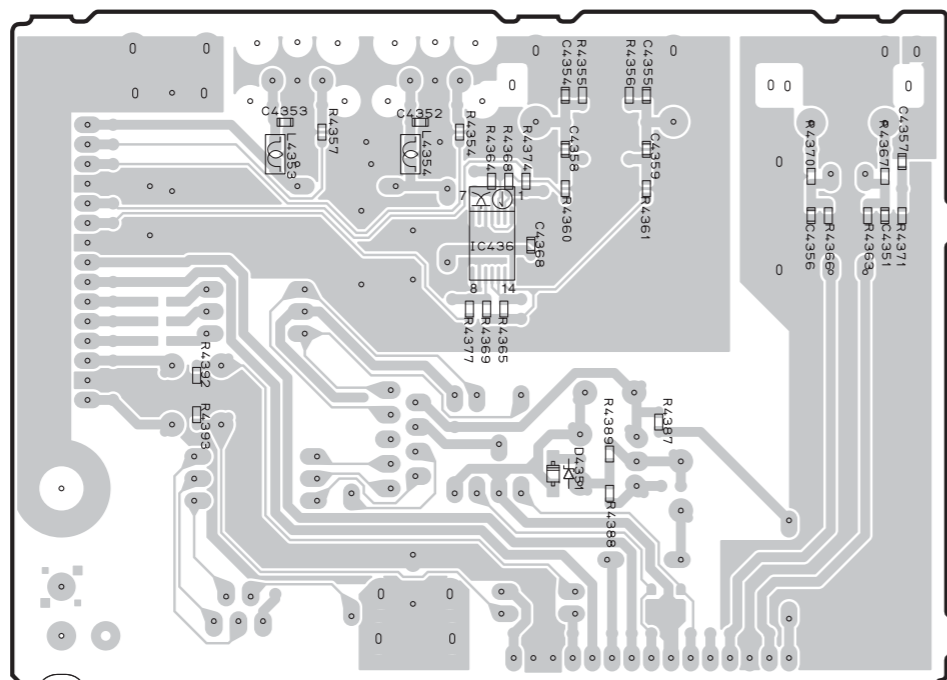
**OPERATION (6)** (Side A)



• Semiconductor Location

Ref no.	Location
IC441	H4
Q4351	D4

1

**OPERATION (4)** (Side B)

2

3

4

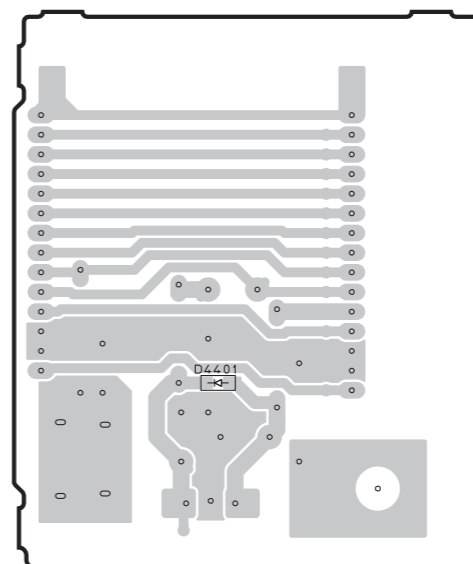
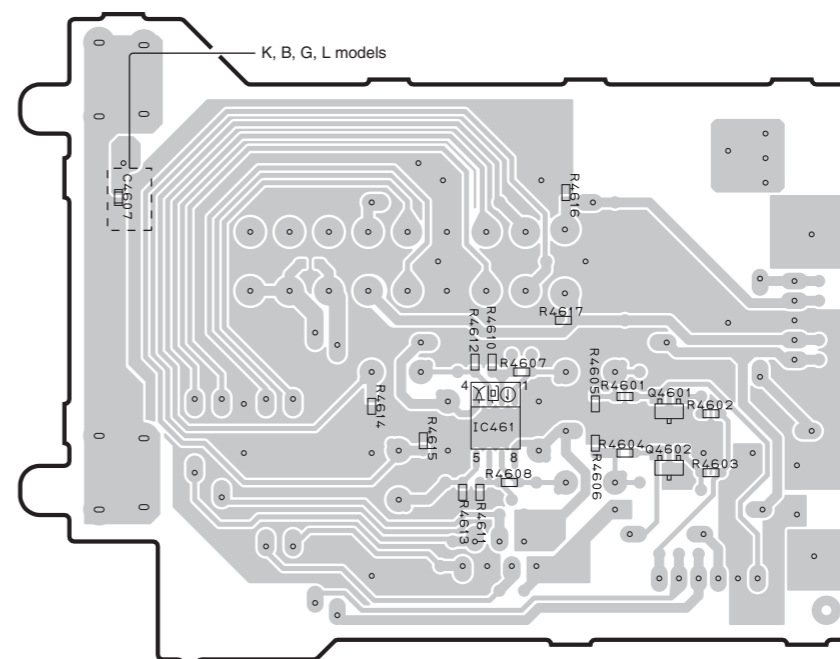
5

## • Semiconductor Location

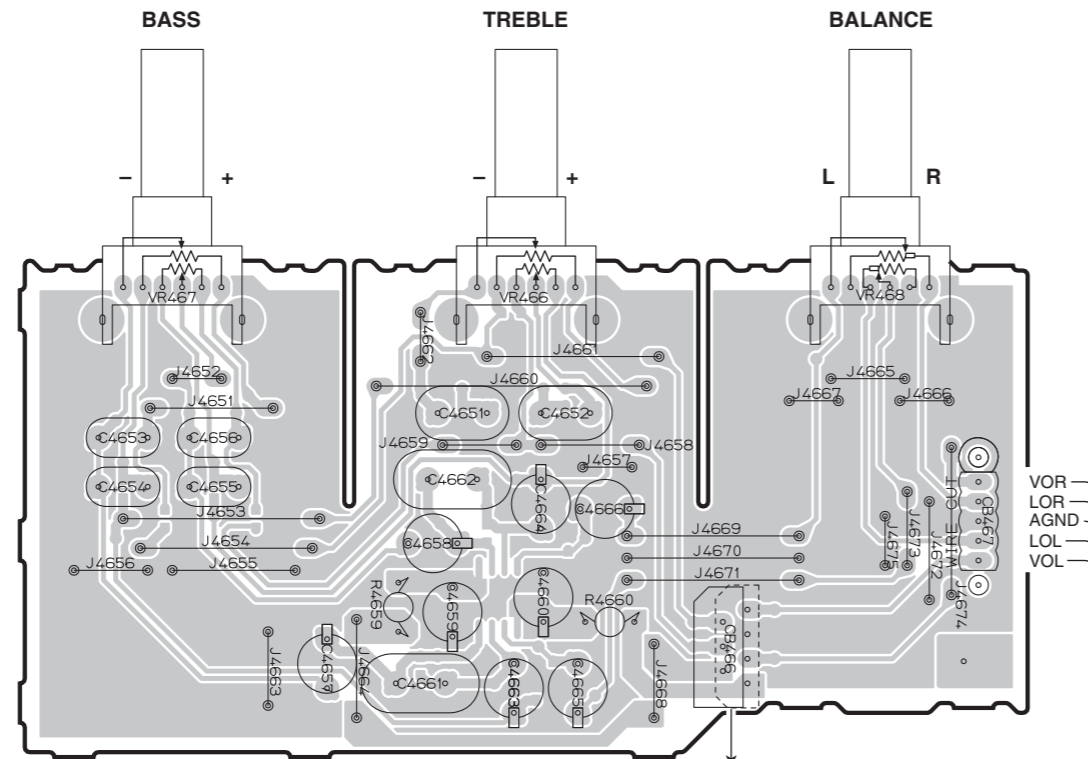
Ref no.	Location
D4351	D4
D4401	G3
IC436	C3
IC461	H6
Q4601	H6
Q4602	H6

6

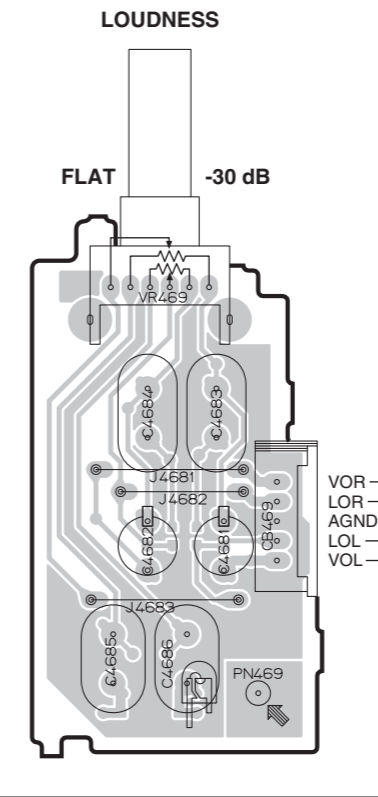
7

**OPERATION (5)** (Side B)**OPERATION (6)** (Side B)

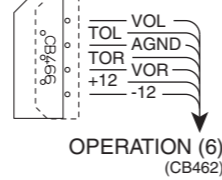
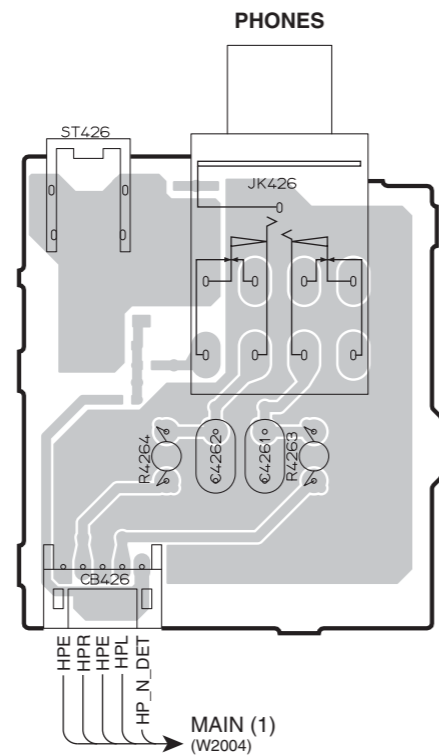
**OPERATION (7)** (Side A)



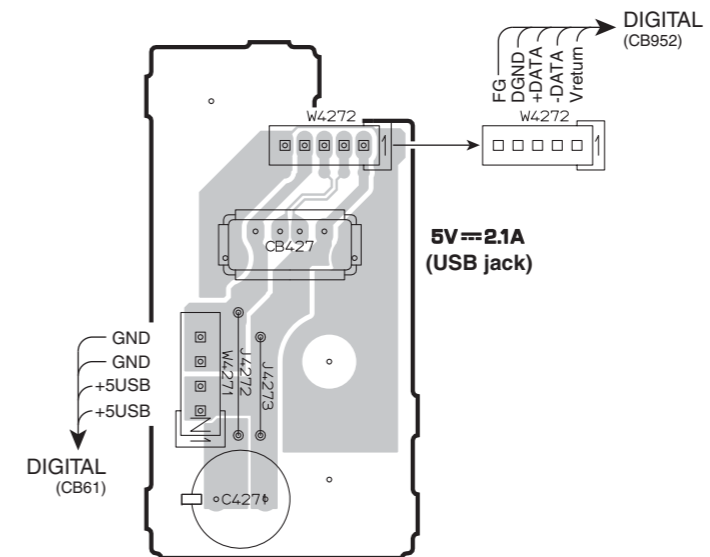
**OPERATION (8)** (Side A)



**OPERATION (10)** (Side A)



**OPERATION (11)** (Side A)



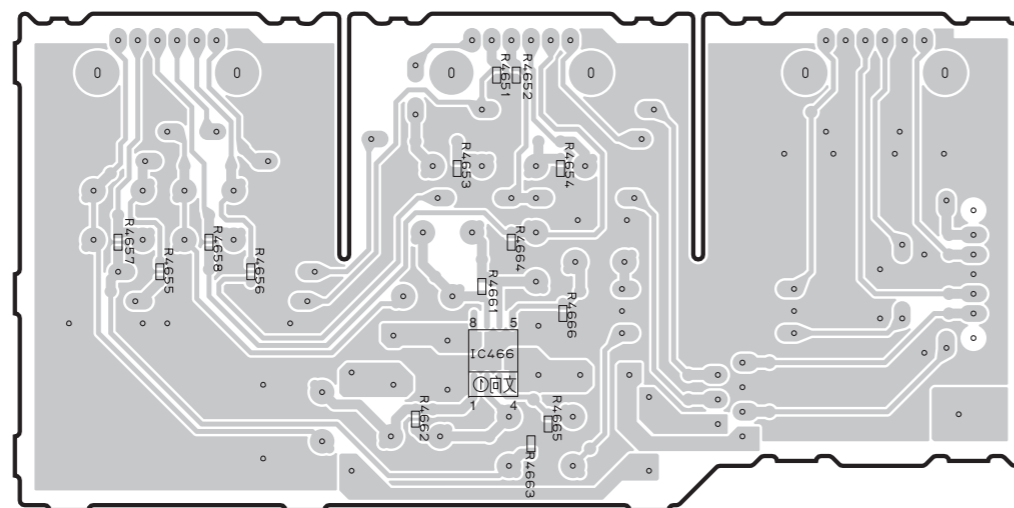
1

**OPERATION (7)** (Side B)

2

3

4

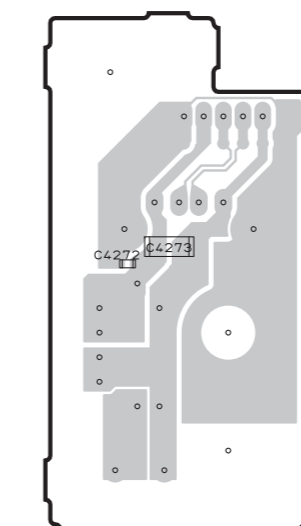
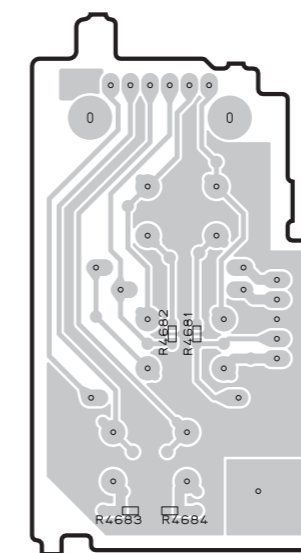
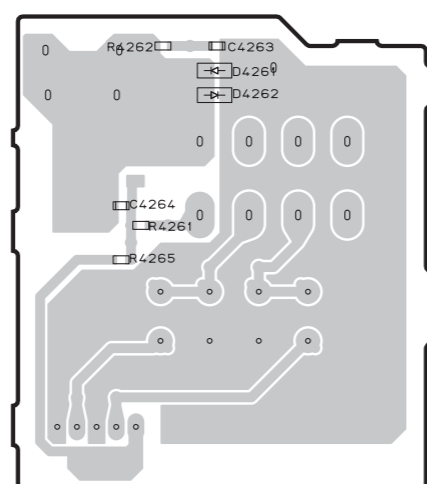
**OPERATION (8)** (Side B)

5

**OPERATION (11)** (Side B)

6

7

**OPERATION (10)** (Side B)

## • Semiconductor Location

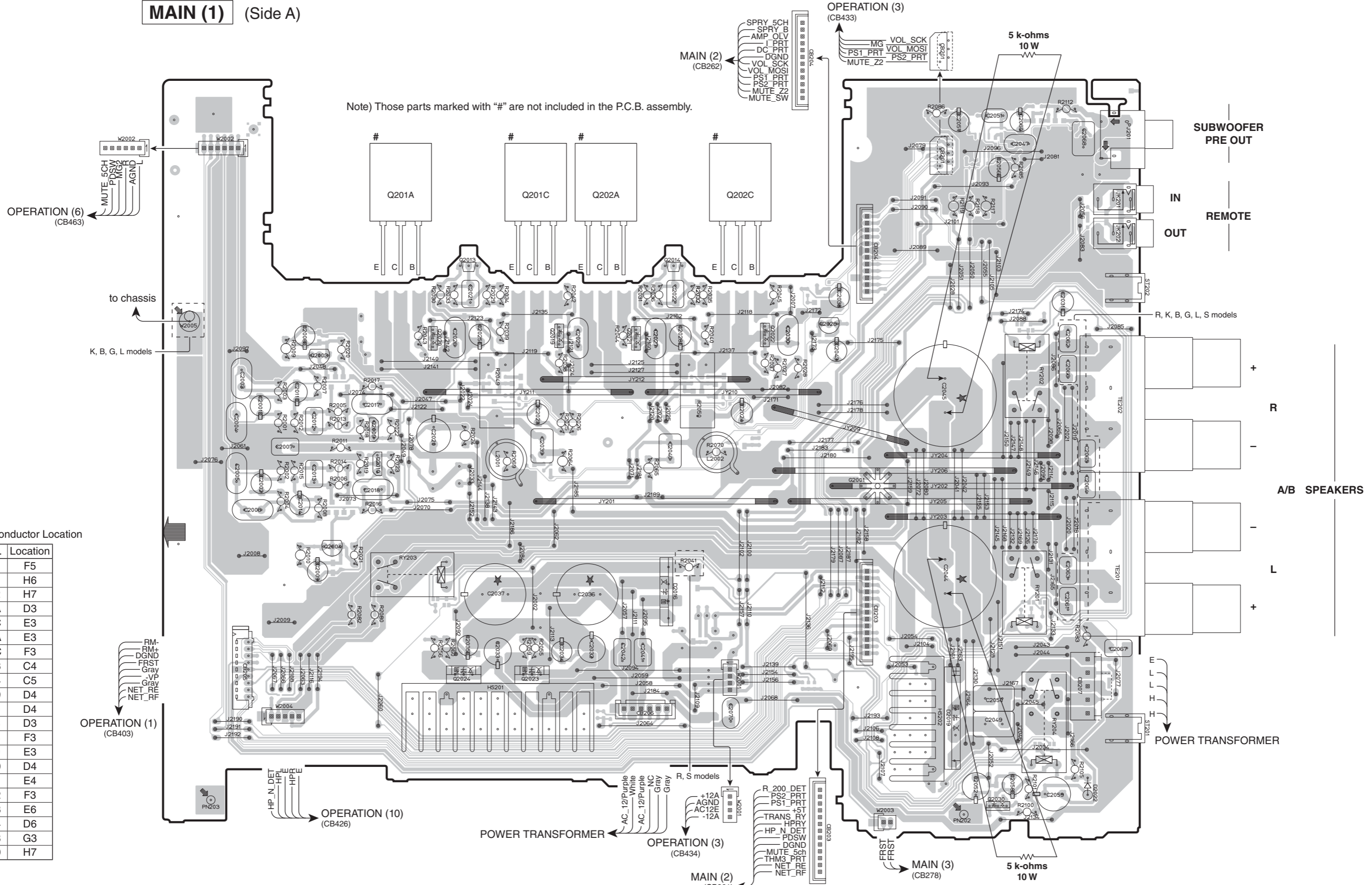
Ref no.	Location
D4261	C5
D4262	C5
IC466	C4

**Safety measures**

- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there. Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity. The time required for discharging is about 30 seconds per each. C2044, C2045 on MAIN (1) P.C.B.

**MAIN (1)** (Side A)

Note) Those parts marked with “#” are not included in the P.C.B. assembly.



• Semiconductor Location

Ref no.	Location
D2016	F5
D2019	H6
D2022	H7
Q201A	D3
Q201C	E3
Q202A	E3
Q202C	F3
Q2003	C4
Q2004	C5
Q2009	D4
Q2010	D4
Q2013	D3
Q2014	F3
Q2019	E3
Q2020	D4
Q2021	E4
Q2022	F3
Q2023	E6
Q2024	D6
Q2028	G3
Q2030	H7



1

**MAIN (1)** (Side B)

2

3

4

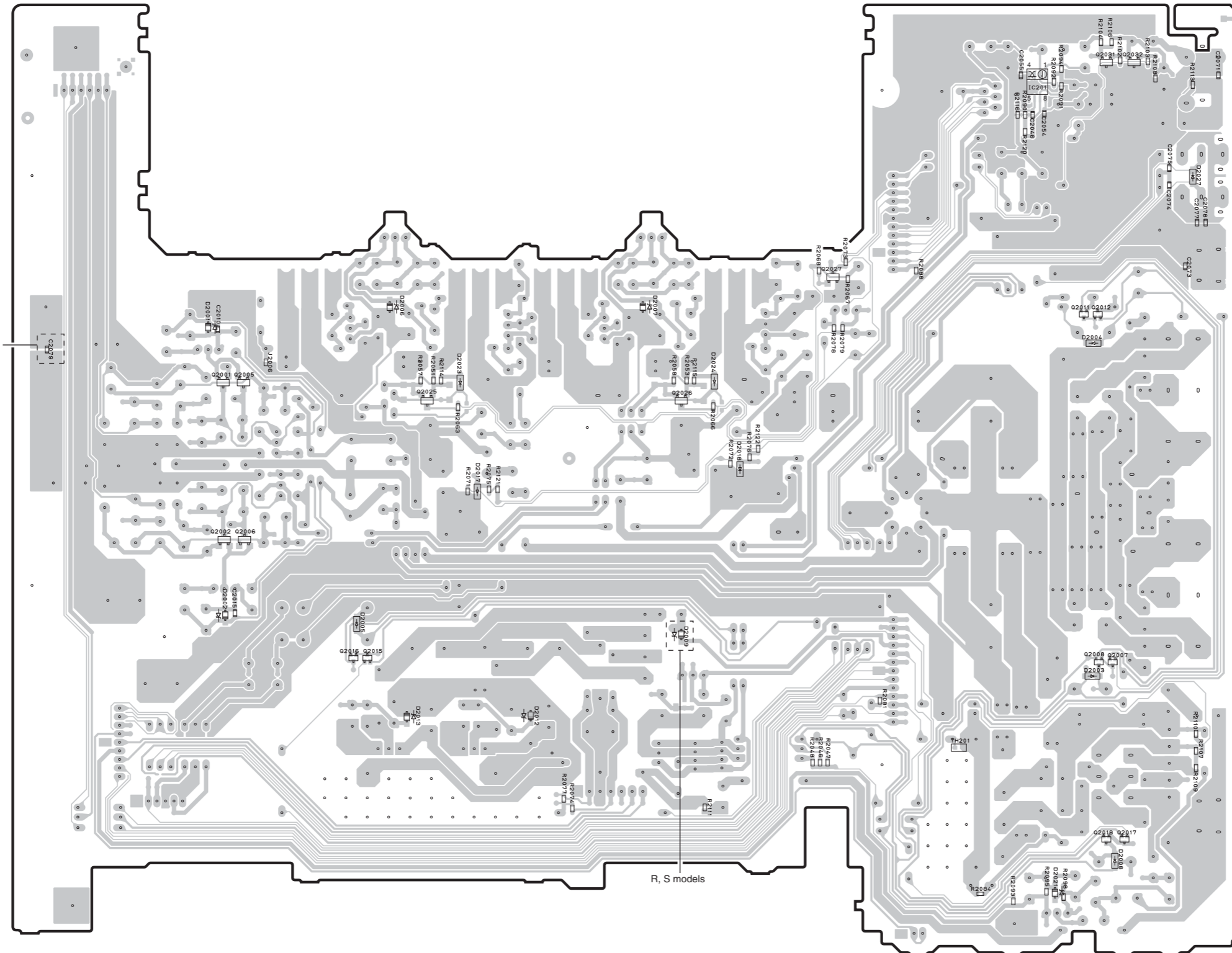
5

6

7

K, B, G, L models

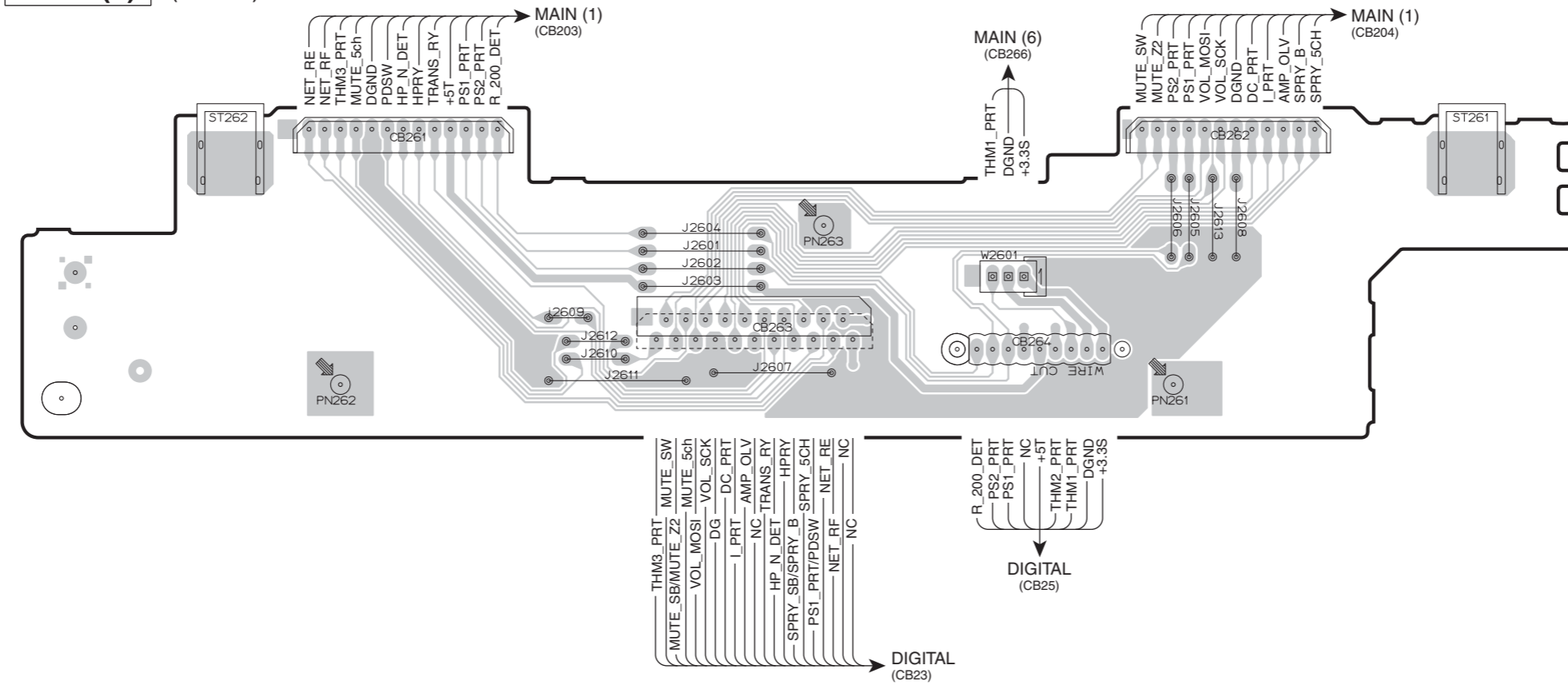
R, S models



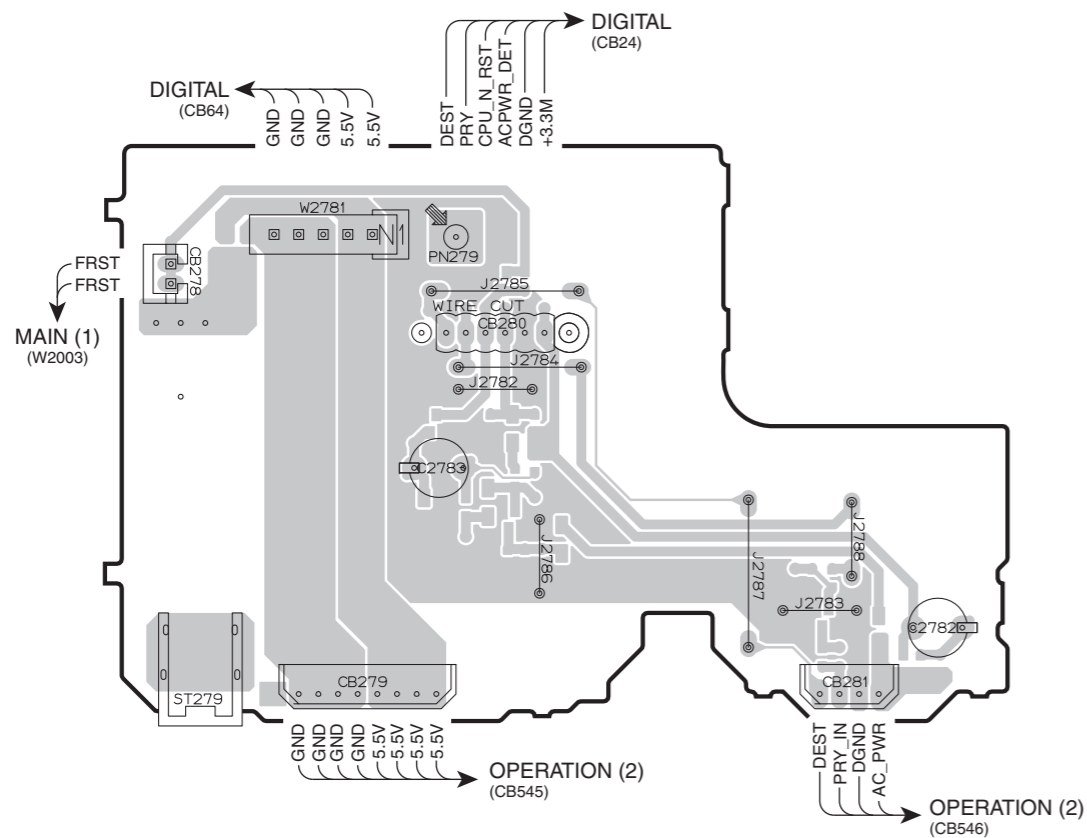
• Semiconductor Location

Ref no.	Location
D2001	C4
D2002	C5
D2003	H5
D2004	H4
D2005	D5
D2006	D3
D2007	E3
D2008	H6
D2009	E5
D2012	E6
D2013	D6
D2017	D4
D2018	F4
D2021	G7
D2023	D4
D2024	F4
D2027	H3
IC201	G2
Q2001	C4
Q2002	C5
Q2005	C4
Q2006	C5
Q2007	H5
Q2008	H5
Q2011	G3
Q2012	H3
Q2015	D5
Q2016	D5
Q2017	H6
Q2018	H6
Q2025	D4
Q2026	E4
Q2027	F3
Q2031	H2
Q2032	H2

**MAIN (2)** (Side A)

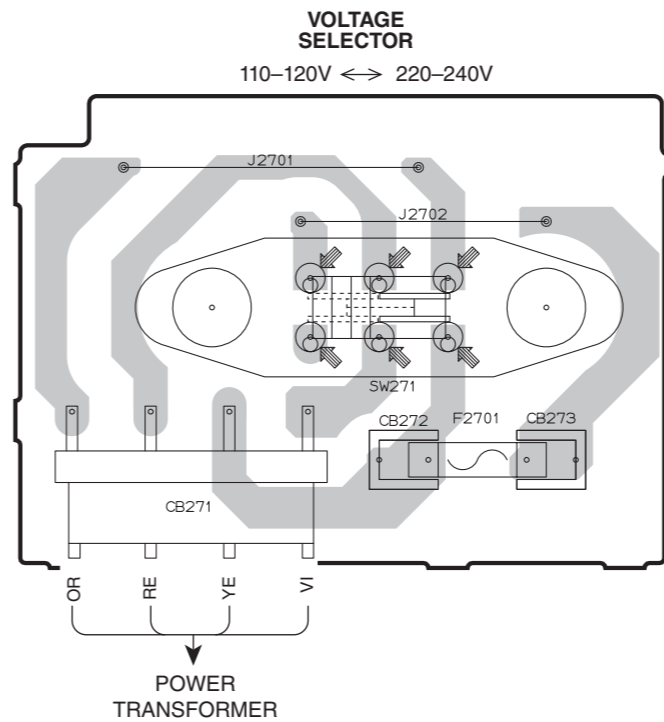


**MAIN (3)** (Side A)

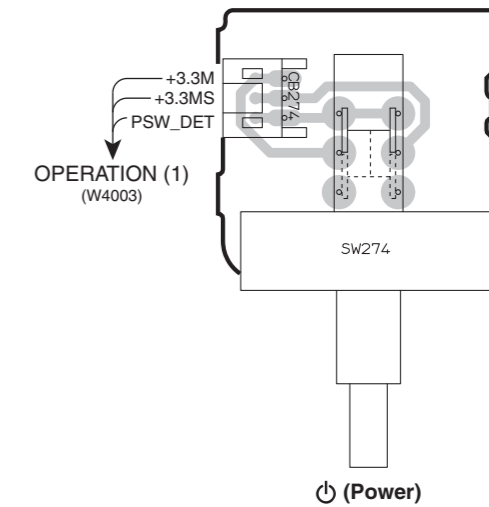


**MAIN (4)** (Side A)

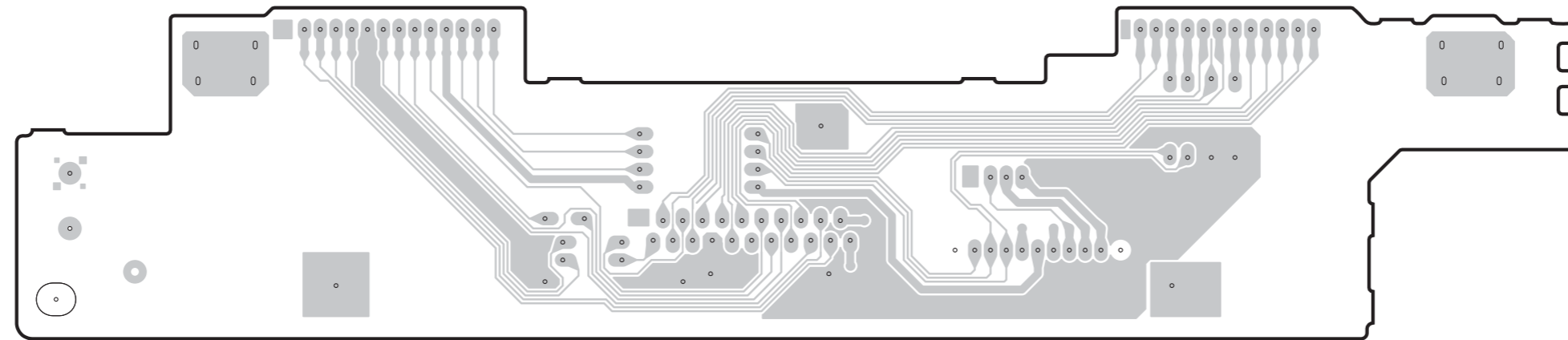
R, S models



**MAIN (5)** (Side A)



1

**MAIN (2)** (Side B)

2

3

## • Semiconductor Location

Ref no.	Location
D2781	D7
D2782	C6
D2783	B6
D2784	B6
D2785	B6
Q2781	B6
Q2782	D6
Q2783	B6

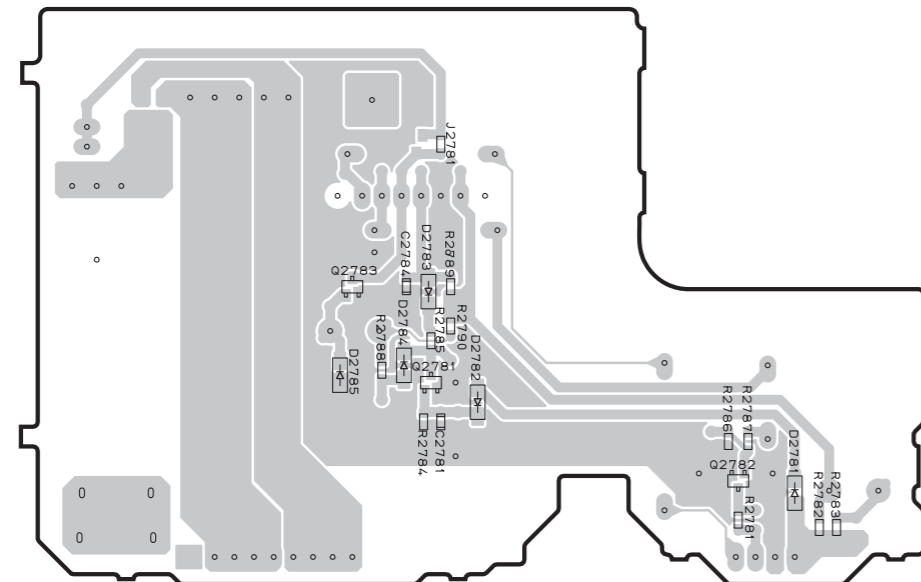
4

**MAIN (3)** (Side B)**MAIN (4)** (Side B)

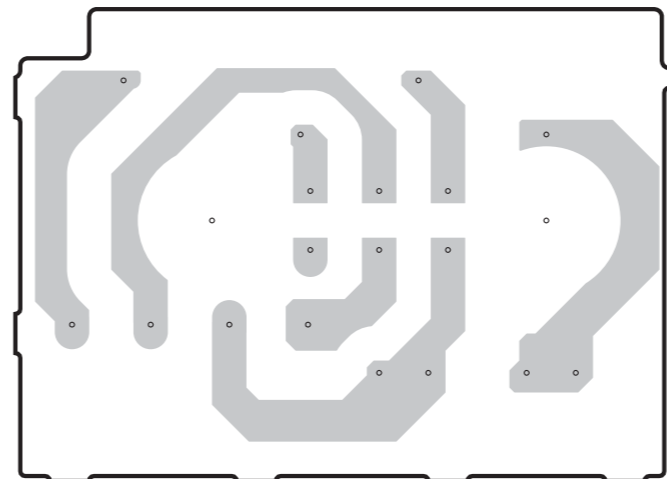
R, S models

**MAIN (5)** (Side B)

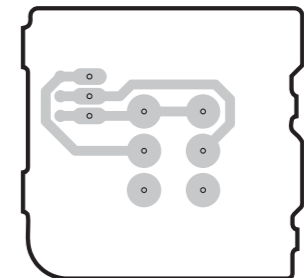
5



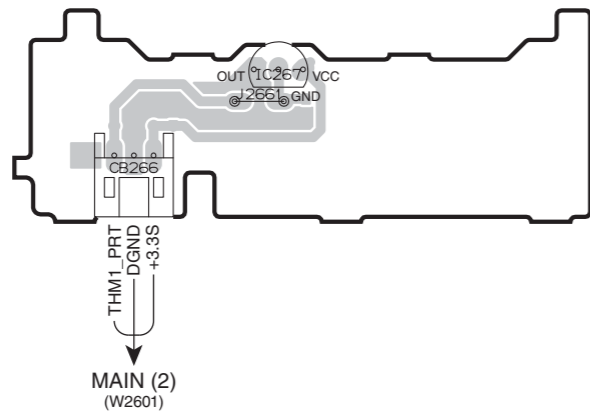
6



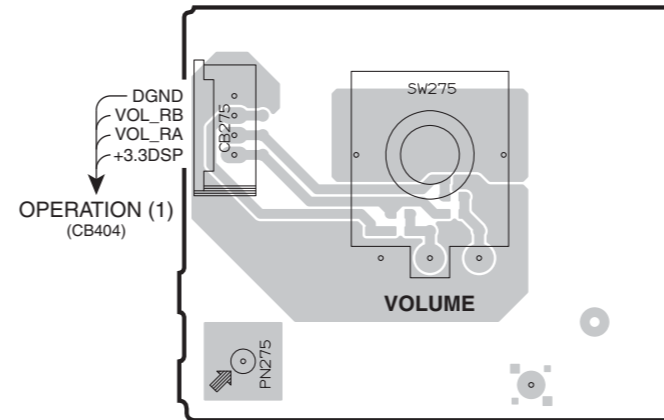
7



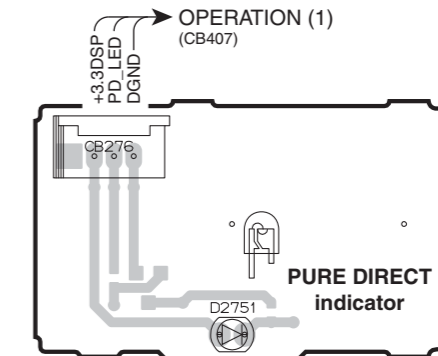
**MAIN (6)** (Side A)



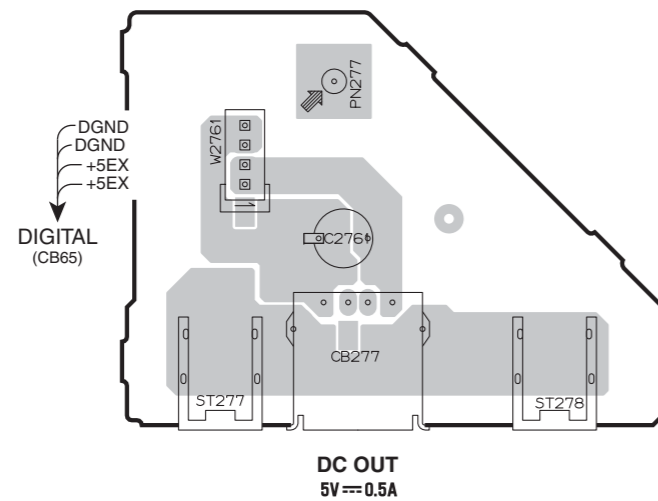
**MAIN (7)** (Side A)



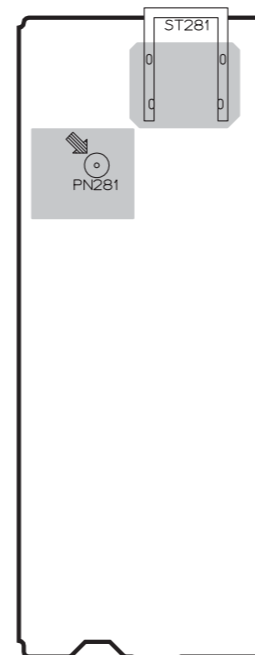
**MAIN (8)** (Side A)



**MAIN (9)** (Side A)



**MAIN (10)** (Side A)

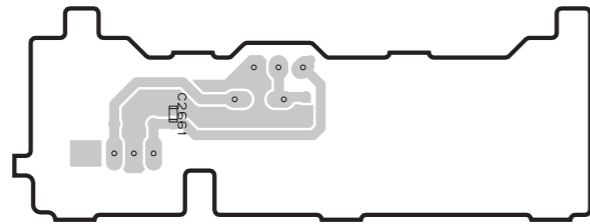


• Semiconductor Location

Ref no.	Location
D2751	I3
IC267	C2

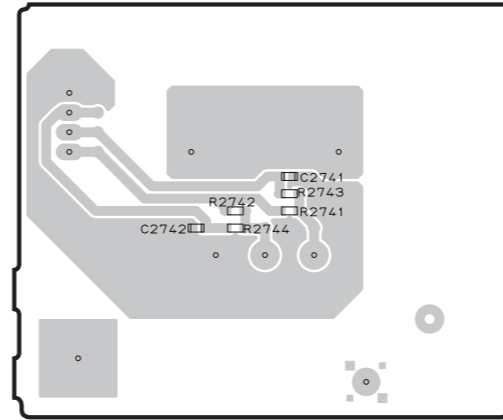
1

**MAIN (6)** (Side B)



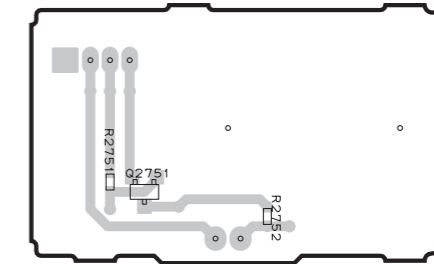
2

**MAIN (7)** (Side B)



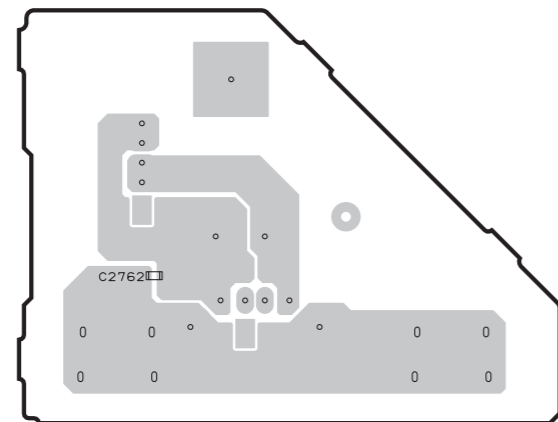
3

**MAIN (8)** (Side B)



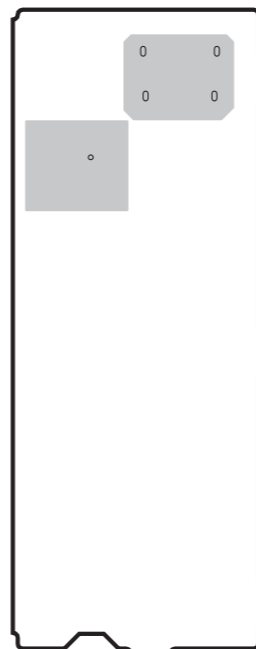
4

**MAIN (9)** (Side B)



5

**MAIN (10)** (Side B)



6

7

• Semiconductor Location

Ref no.	Location
Q2751	H3

## PIN CONNECTION DIAGRAMS

### • ICs

<b>A3V56S30FTP-G6</b> 	<b>BD3473KS2</b> 	<b>BD7542F-E2</b> 	<b>BD9328FJ</b> 	<b>DM860A-AQE</b> 
<b>KIA7805API</b> 	<b>LAN8700C-AEZG-TR</b> 	<b>LM19CIZ/LF</b> 	<b>M66003-0131FP-R</b> 	<b>MFI337S3959</b> 
<b>MX29GL256FLT2I-90Q</b> 	<b>NJM2068MD-TE2</b> 	<b>NJM4580E</b> 	<b>PCM5101PWR</b> 	<b>PCM9211PTR</b> 
<b>R1172H121D-T1-F</b> <b>R1172H501D-T1-F</b> 	<b>R1EX25032ATA00A</b> 	<b>R5F3651TNFC</b> 	<b>RP130Q331D-TR-F</b> <b>RP130Q501D-TR-F</b> 	<b>STR2A153</b> 
<b>TC74HC14AF</b> 	<b>TC74VHCU04FT</b> 	<b>TC7WH125FK</b> <b>TC7WH126FK</b> 	<b>TL431ACLPR</b> 	

### • Diodes

<b>1N4003S</b> 	<b>1SS355VMTE-17</b> 	<b>DBL155G</b> 	<b>RB215T-90</b> 	<b>RF101L2STE25</b> 	<b>RS203M-B-C-J80</b> 
<b>RS603M-B-C-J80</b> 	<b>SARS05</b> 	<b>UDZV4.3B</b> <b>UDZV5.1B</b> <b>UDZV5.6B</b> <b>UDZV7.5B</b> <b>UDZV10B</b> <b>UDZV13B</b> <b>UDZV30B</b> <b>UDZV39B</b> 			

### • Transistors

<b>2N5401C-AT/P</b> 	<b>2SA1163-GR</b> 	<b>2SA1576UBTLR</b> 	<b>2SA1695 O,P,Y</b> <b>2SC4468 O,P,Y</b> 	<b>2SA1708</b> <b>2SC4488</b> 	<b>2SB1257</b> <b>2SD2014</b> 	<b>INA6002AC1-TH12-1W</b> <b>INC6002AC1-T112-1W</b> 
<b>2SC4081UBTLR</b> 	<b>2SC4115S</b> 	<b>2SD2704 K</b> 	<b>DTA044EUBTL</b> <b>DTC014EUBTL</b> <b>DTC044EUBTL</b> 	<b>HN4B01JE</b> 	<b>KTC3206Y-ATP</b> 	<b>KTC3198 Y AT</b> 
<b>KTC3875S</b> 	<b>RAL035P01</b> 					

**SCHEMATIC DIAGRAMS**  
DIGITAL 1/4

Page 75 [F10]  
to OPERATION (1)\_CB402

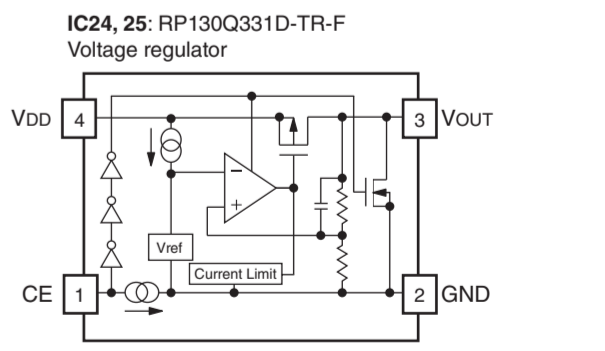
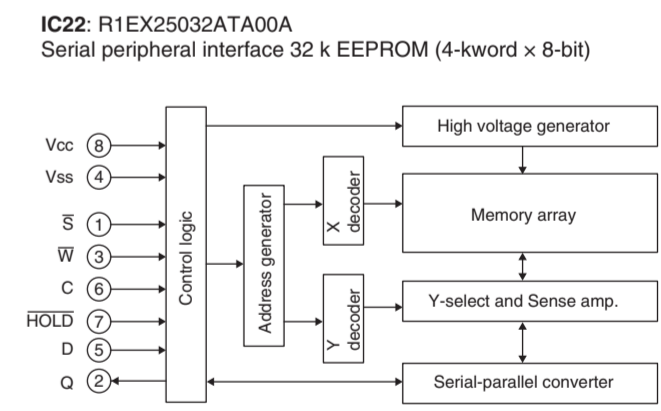
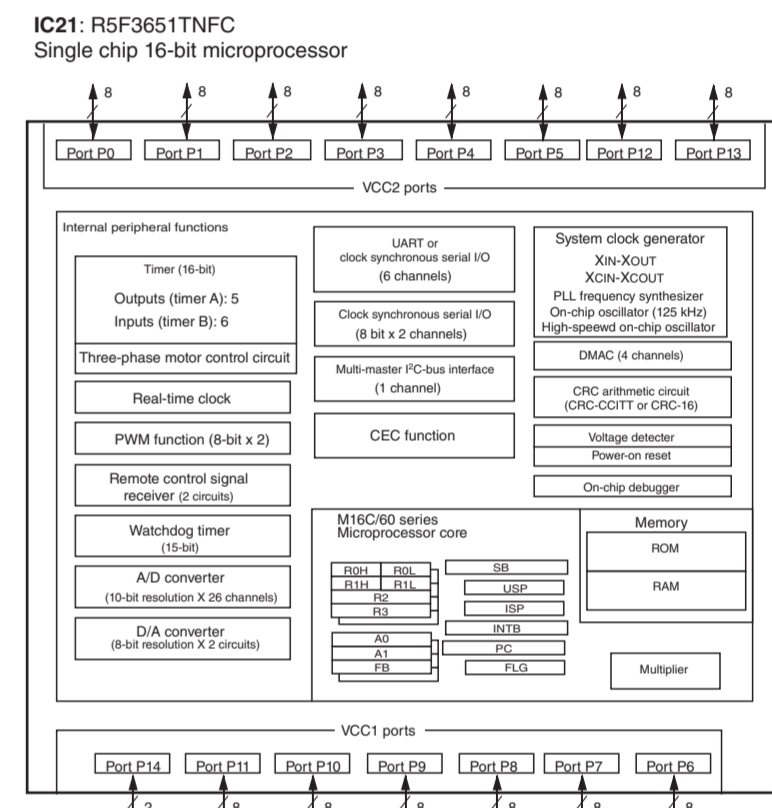
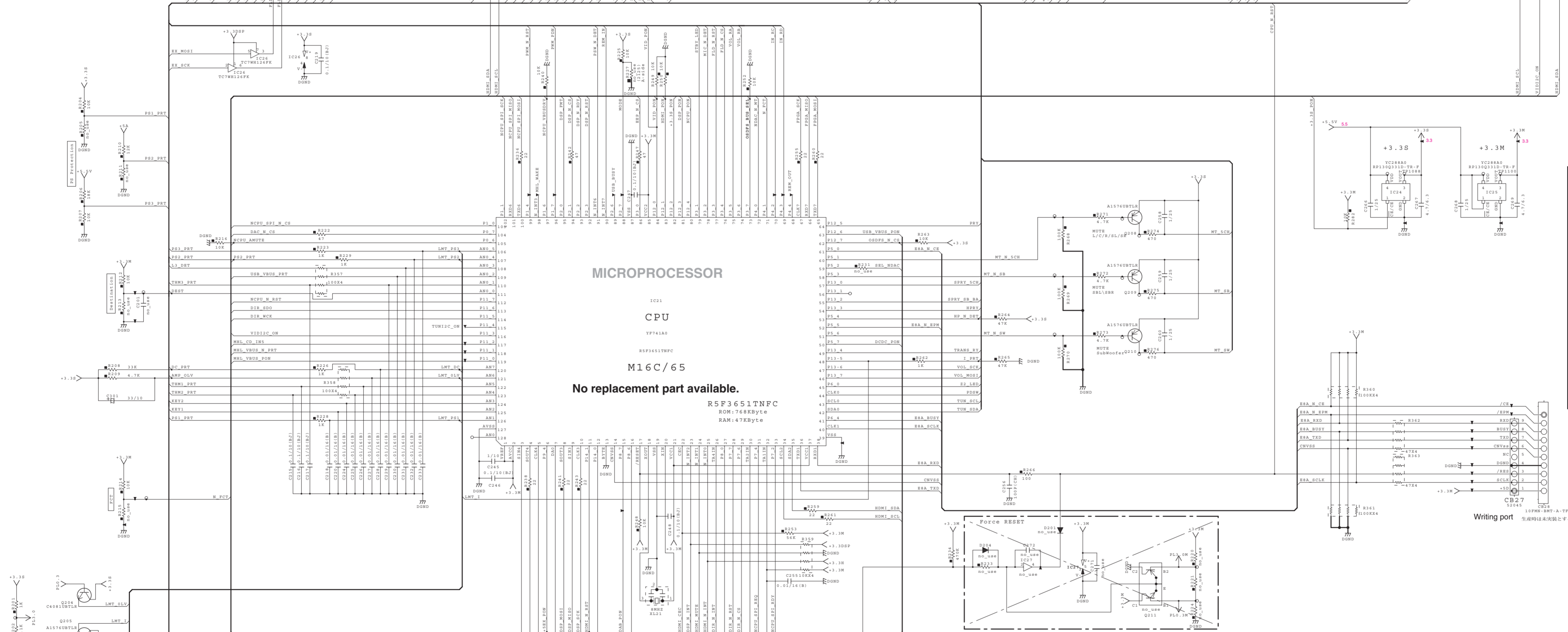
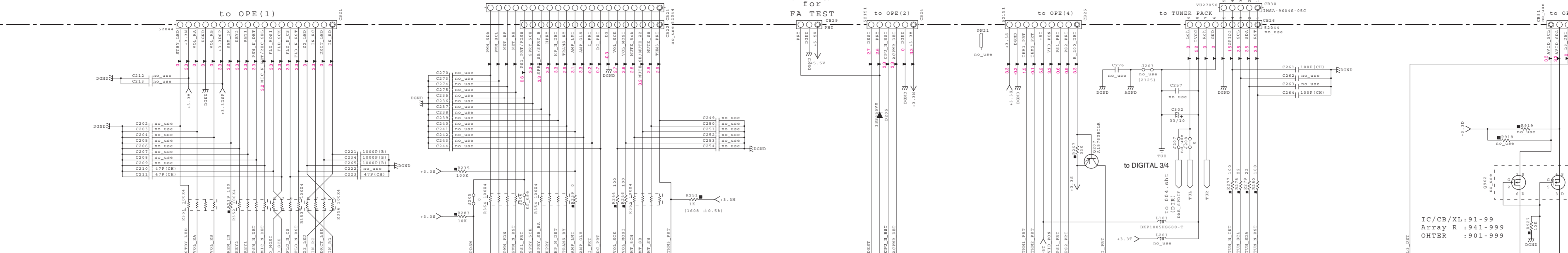
Page 78 [H9]  
to MAIN (2)\_CB263

(for factory)

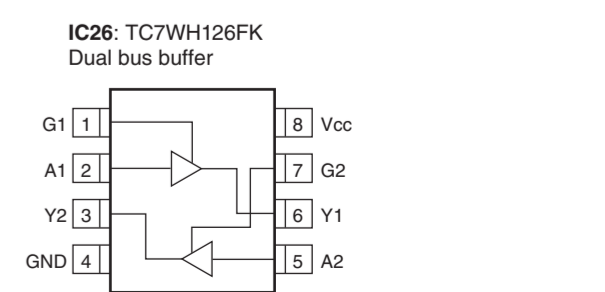
Page 78 [N7]  
to MAIN (3)\_CB280

Page 78 [J9]  
to MAIN (2)\_CB264

Page 76 [J5]  
to OPERATION (4)\_CB439



Pin No.	Symbol	Description
1	CE	Chip Enable (T* Active)
2	GND	Ground Pin
3	VOUT	Output Pin
4	Vin	Input Pin



REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P-5)
△	CARBON FILM RESISTOR (P-10)
▲	METAL OXIDE FILM RESISTOR
△	METAL FILM RESISTOR
⊠	METAL PLATE RESISTOR
□	PIRE PROOF CARBON FILM RESISTOR
⊞	CEMENT MOLDED RESISTOR
⊞	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

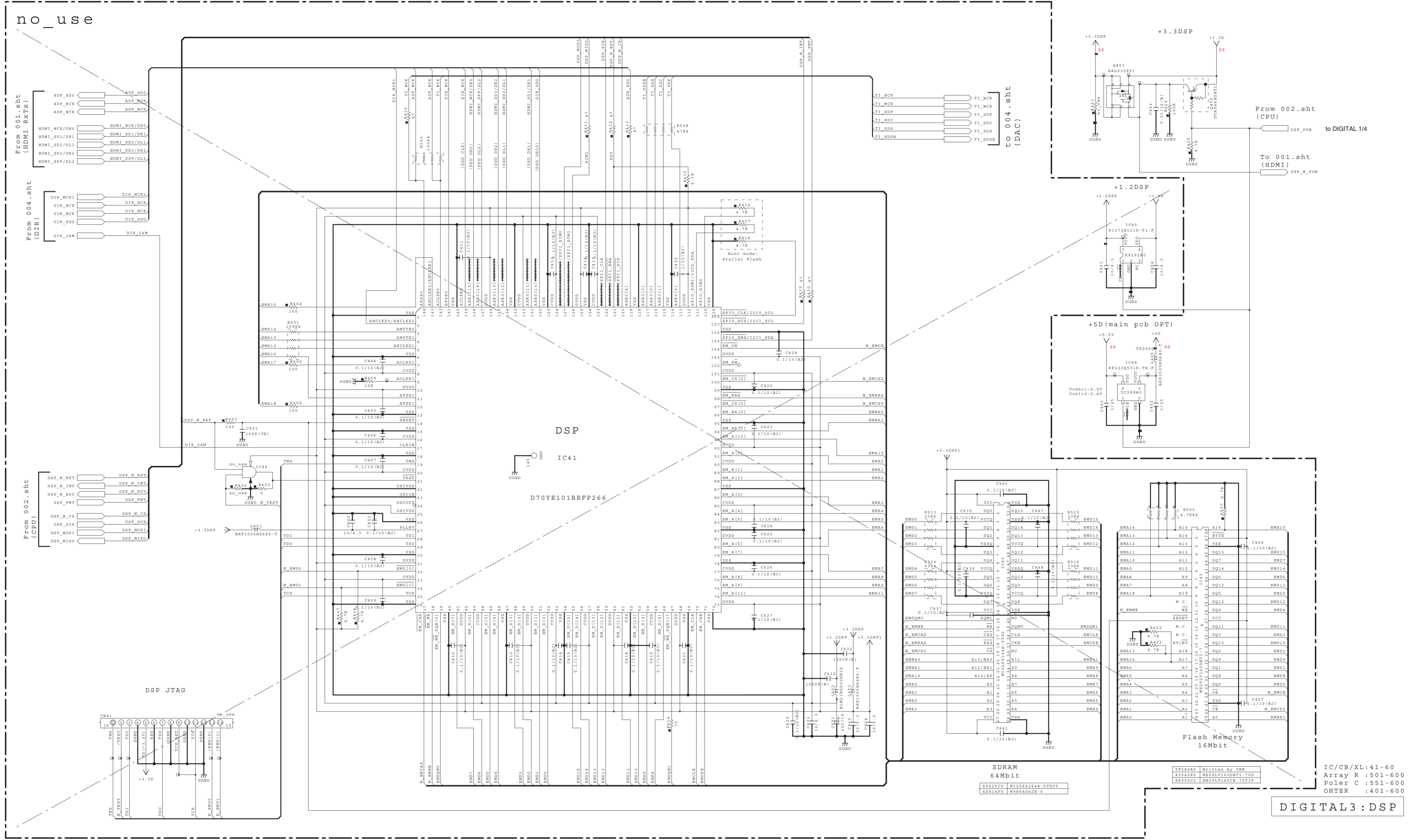
REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
NO MARK	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
NO MARK	CERAMIC TUBULAR CAPACITOR
○	POLYESTER FILM CAPACITOR
○	POLYESTER FILM CAPACITOR
○	MICA CAPACITOR
○	POLYPROPYLENE FILM CAPACITOR
○	SEMICONDUCTIVE CERAMIC CAPACITOR
○	POLYPHENYLENE SULFIDE FILM CAPACITOR

**NOTICE (model)**  
(J)..... JAPAN  
(U)..... U.S.A  
(C)..... CANADA  
(R)..... GENERAL  
(T)..... CHINA  
(K)..... KOREA  
(A)..... AUSTRALIA  
(B)..... BRITISH  
(G)..... EUROPE  
(L)..... SINGAPORE  
(S)..... SOUTH EUROPE  
(V)..... TAIWAN  
(P)..... RUSSIAN  
(\*)..... LATIN AMERICA  
(S)..... BRAZIL  
(H)..... THAI

\* All voltages are measured with a 10MΩV DC electronic voltmeter.  
\* Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.  
\* Schematic diagram is subject to change without notice.

IC/CS/XL:21-40  
Array R :351-400  
Cheml.C :301-400  
OHTER :201-400

DIGITAL2:CPU



**RESISTOR**

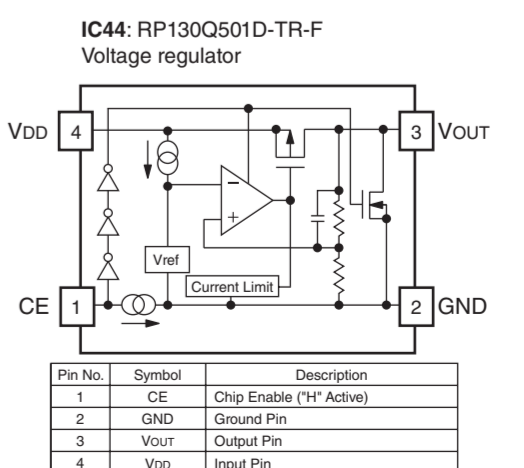
REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
□	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
■	METAL PLATE RESISTOR
□	FIBRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
□	SEMI-VARIABLE RESISTOR
■	CHIP RESISTOR

**CAPACITOR**

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
⊗	CERAMIC TUNABLE CAPACITOR
⊙	POLYESTER FILM CAPACITOR
○	POLYSTYRENE FILM CAPACITOR
○	MICA CAPACITOR
○	POLYPROPYLENE FILM CAPACITOR
○	SEMICONDUCTIVE CERAMIC CAPACITOR
○	POLYPHENYLENE SULFIDE FILM CAPACITOR

**NOTICE (model)**

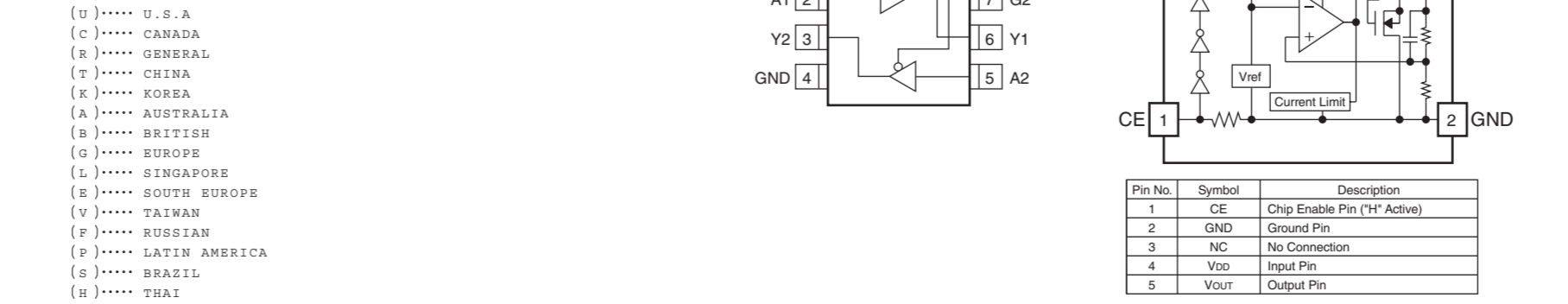
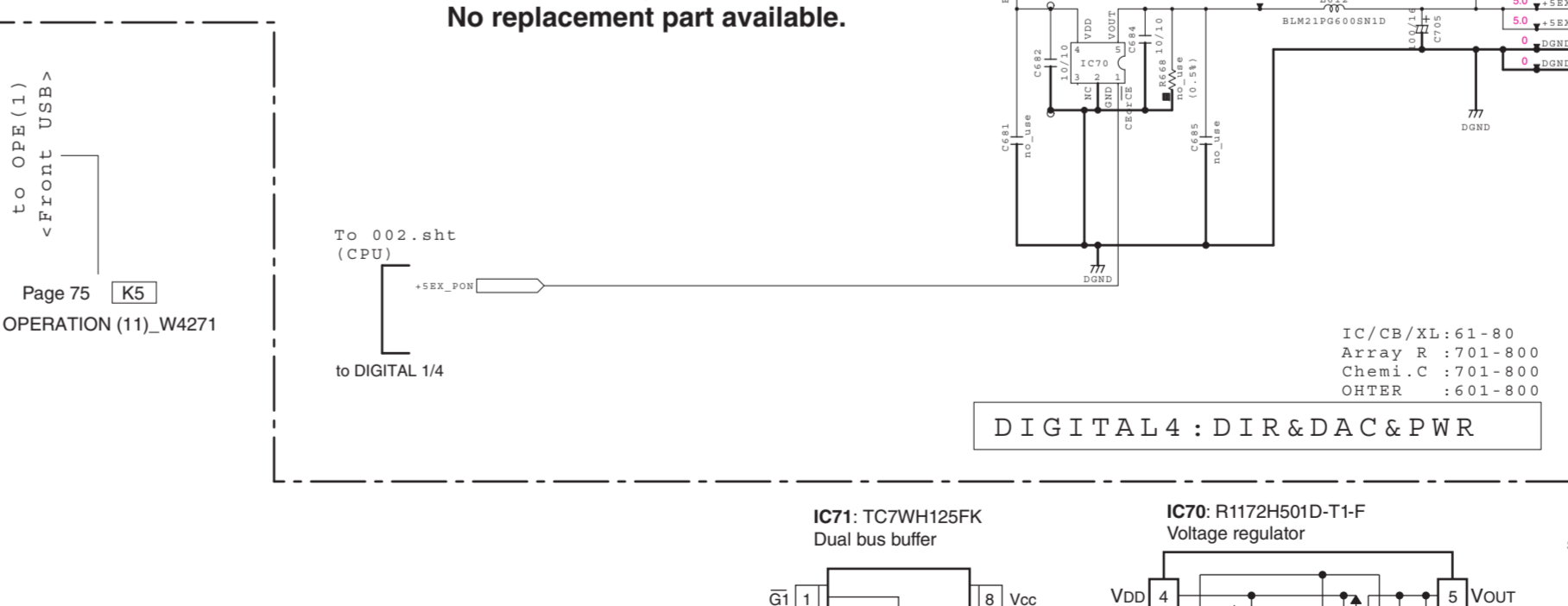
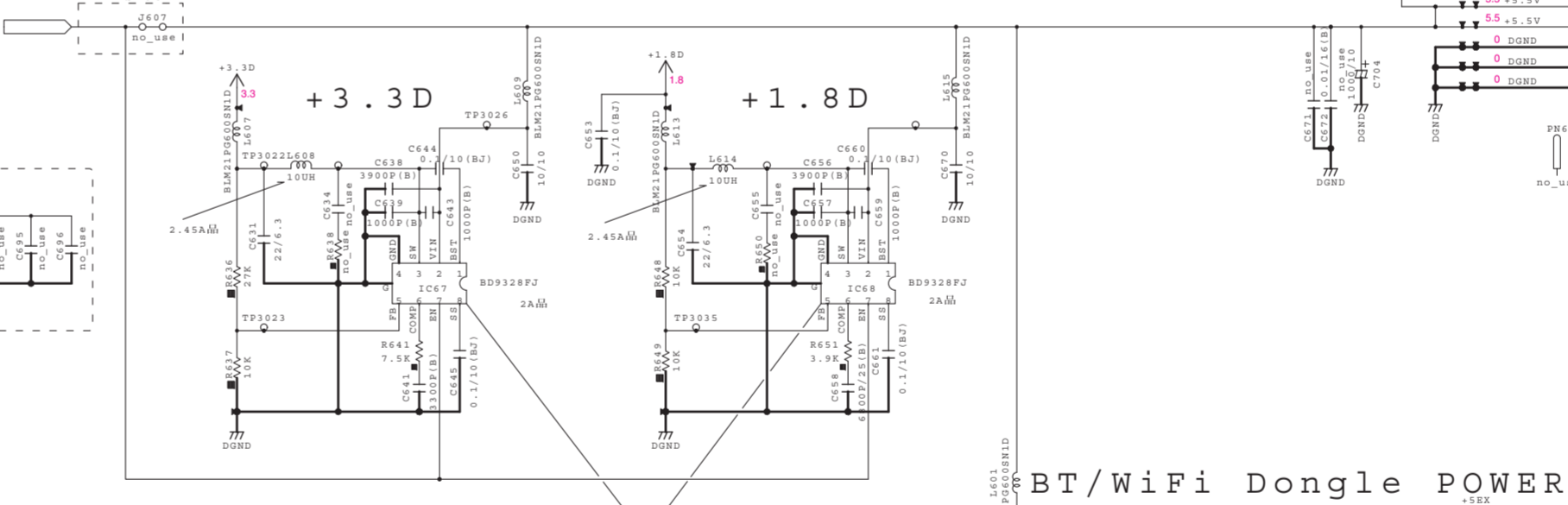
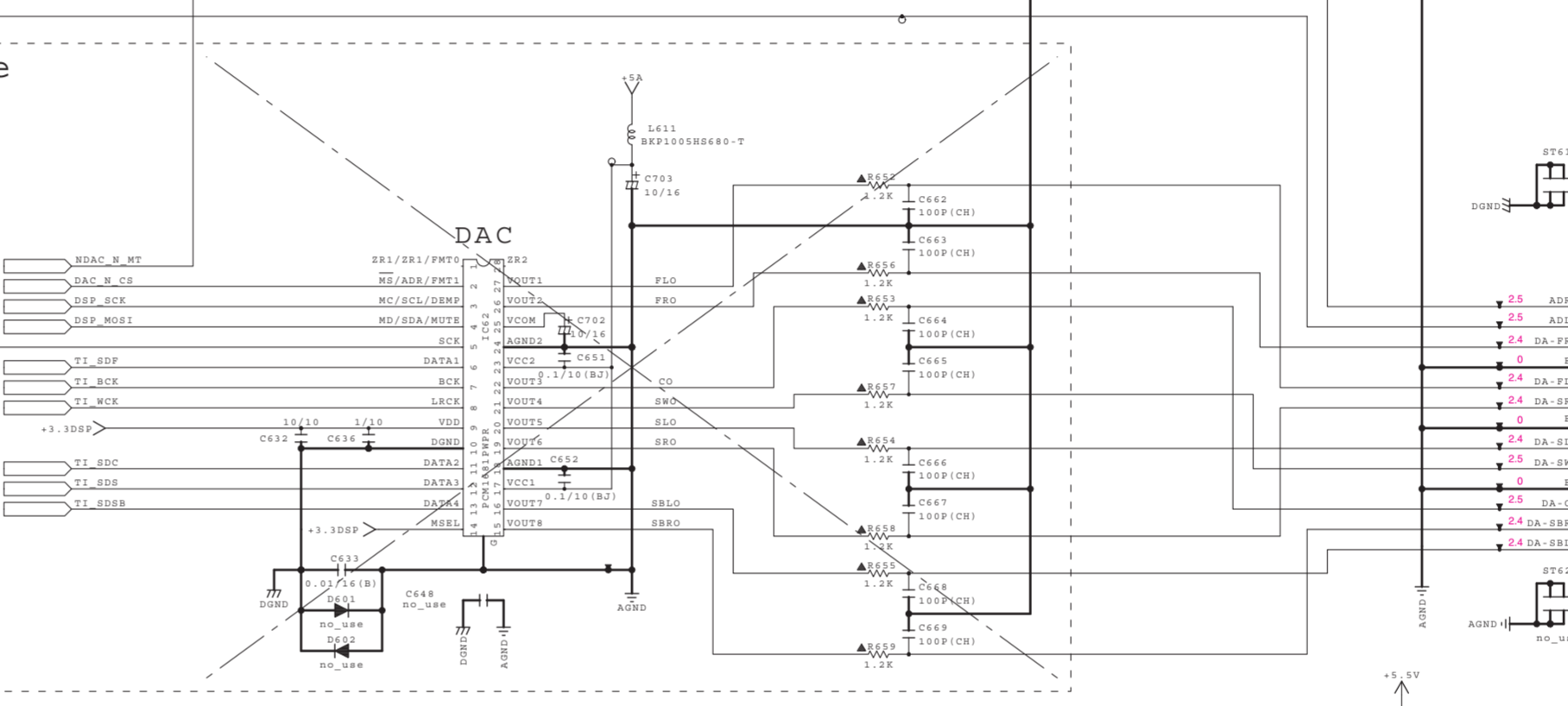
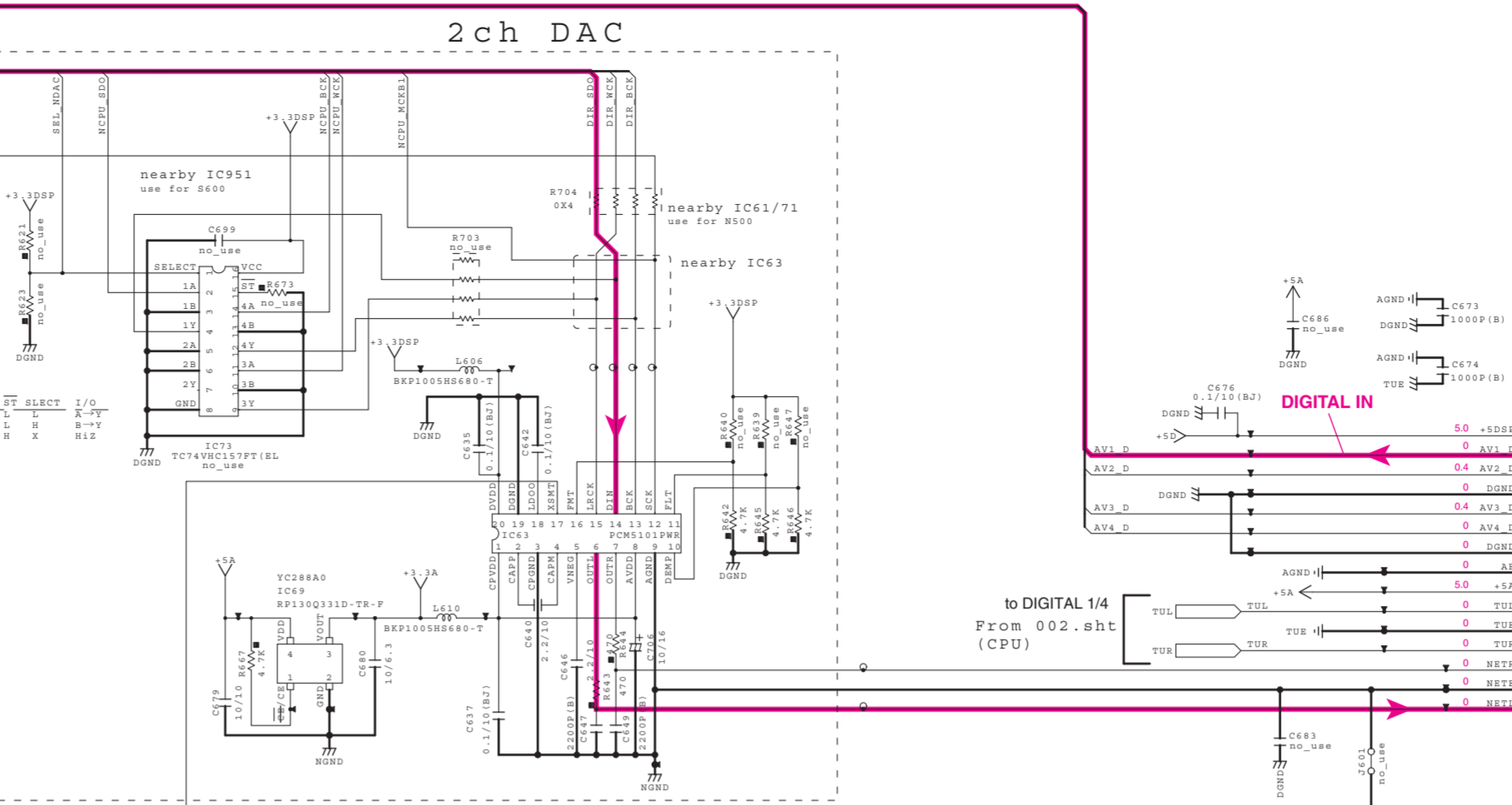
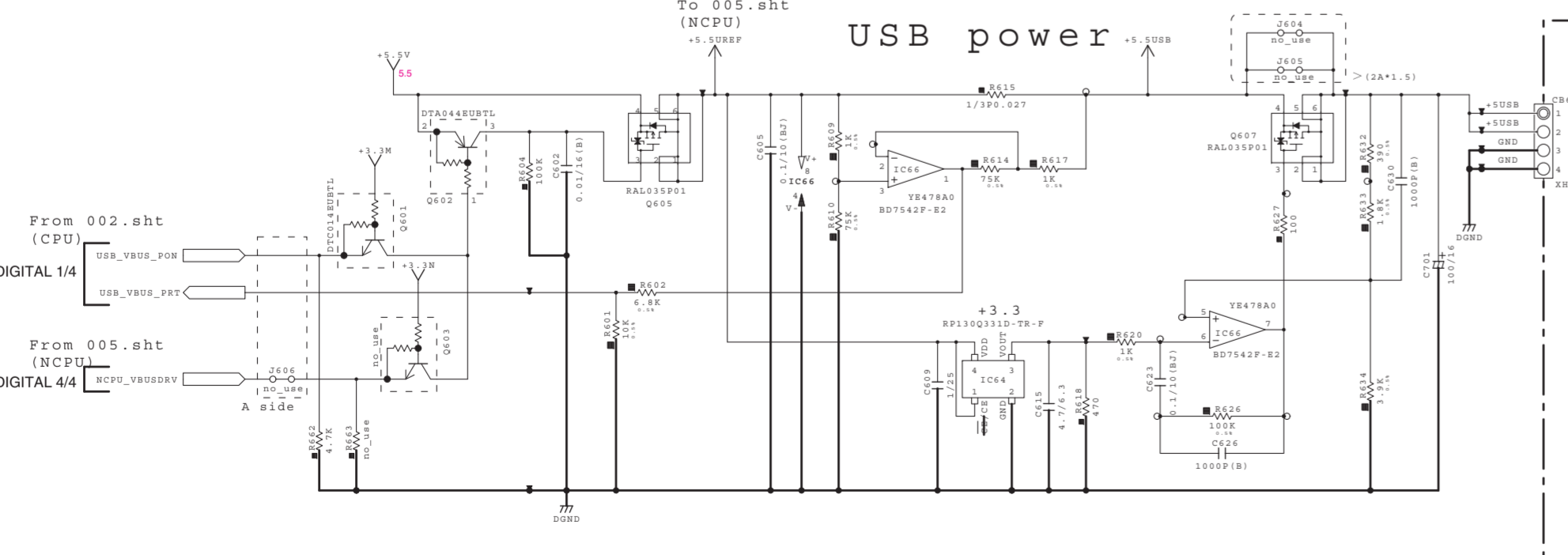
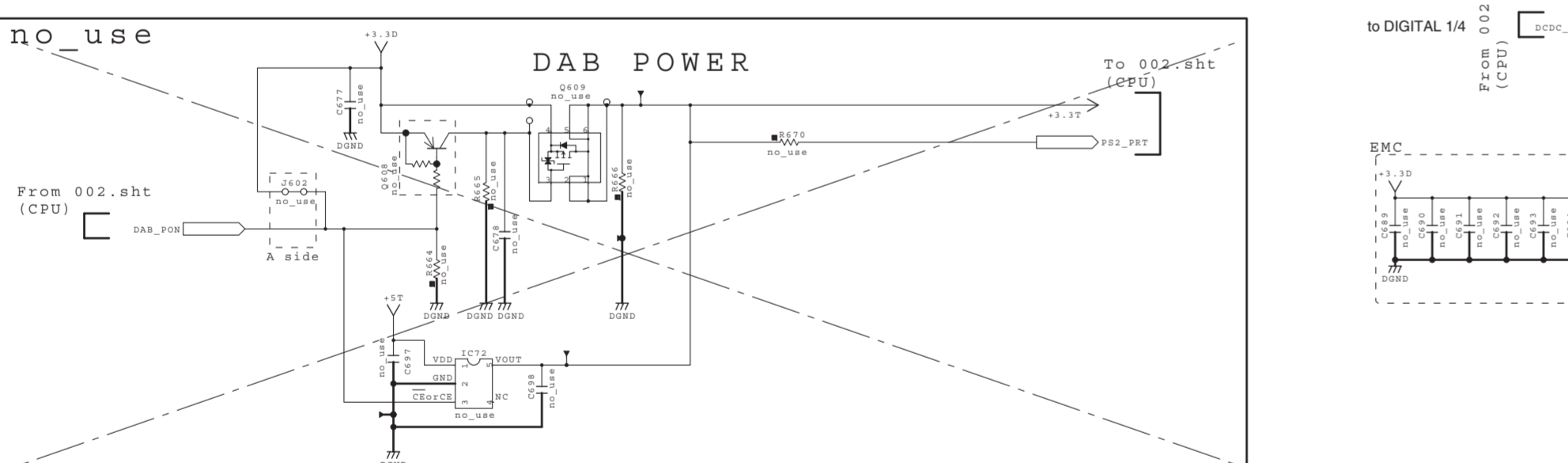
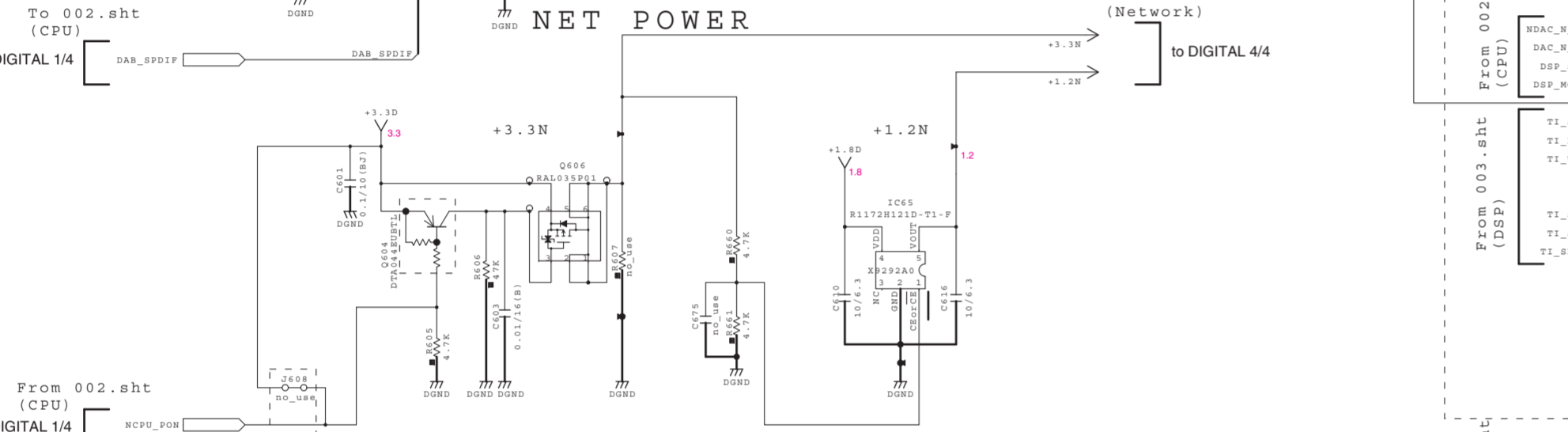
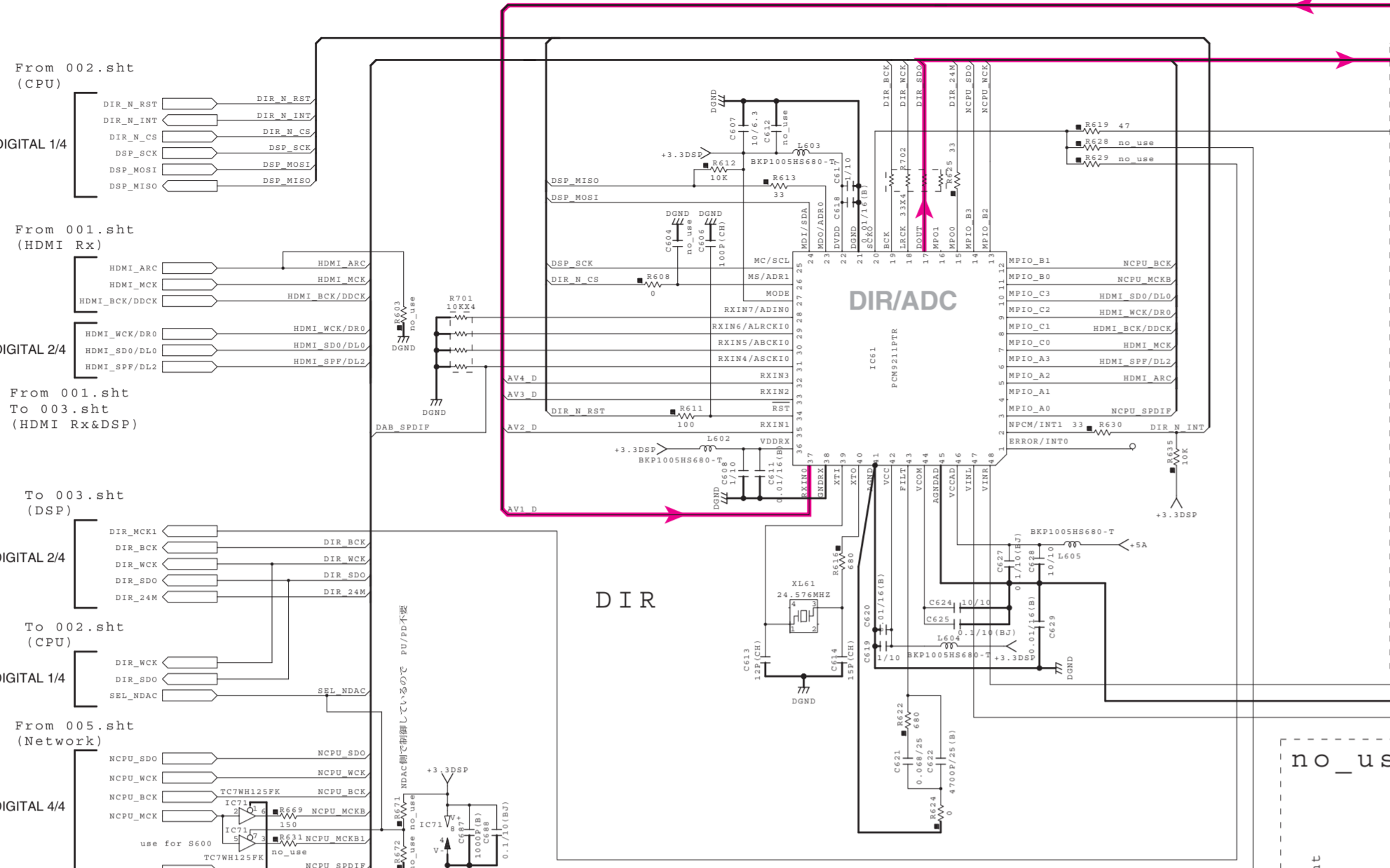
(J)..... JAPAN  
 (U)..... U.S.A  
 (C)..... CANADA  
 (K)..... GERMANY  
 (S)..... CHINA  
 (K)..... KOREA  
 (A)..... AUSTRALIA  
 (B)..... BRITISH  
 (G)..... EUROPE  
 (L)..... SWITZERLAND  
 (S)..... SOUTH EUROPE  
 (V)..... TAIWAN  
 (P)..... RUSSIAN  
 (S)..... LATIN AMERICA  
 (S)..... BRAZIL  
 (H)..... THAI



\* All voltages are measured with a 10MΩ/V DC electronic voltmeter.  
 \* Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.  
 \* Schematic diagram is subject to change without notice.



DIGITAL 3/4

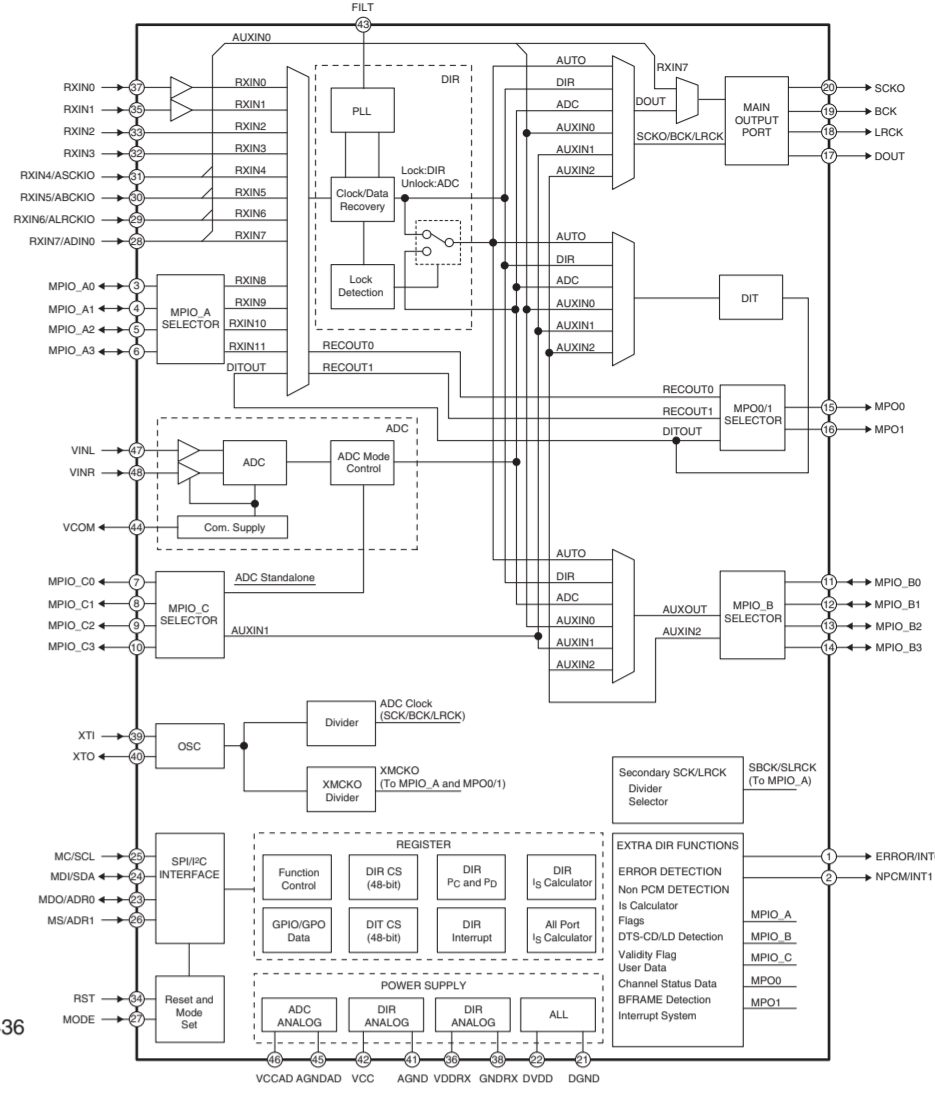


NOTICE
(J) JAPAN
(U) U.S.A.
(C) CANADA
(R) CHINA
(K) KOREA
(A) AUSTRALIA
(B) BRITISH
(G) EUROPE
(L) SINGAPORE
(S) SOUTH EUROPE
(V) TAIWAN
(P) RUSSIAN
(B) BRAZIL
(H) HAI

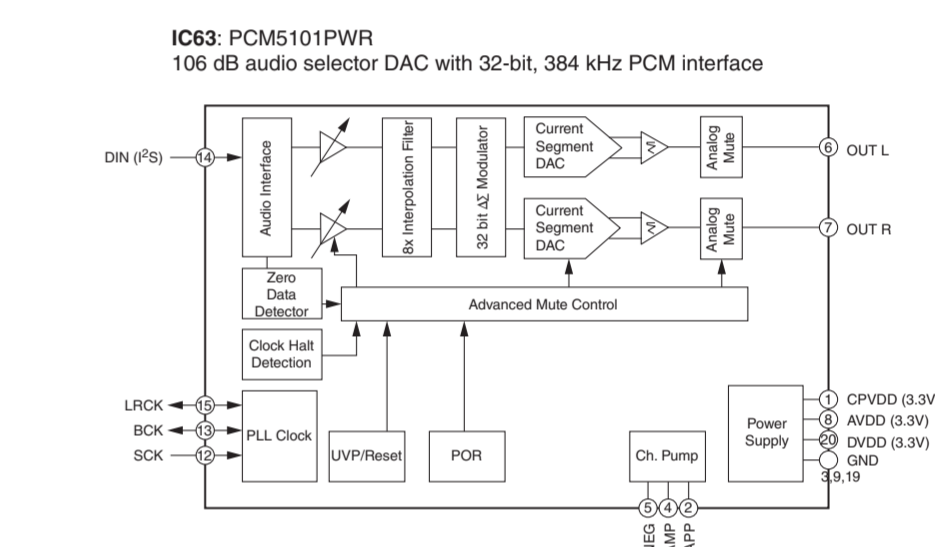
Table with 2 columns: CAPACITOR and RESISTOR. Lists various capacitor and resistor types and their part names.

All voltages are measured with a 10MΩV DC electronic voltmeter.
Components having special characteristics are marked A and must be replaced with parts having specifications equal to those originally installed.
Schematic diagram is subject to change without notice.

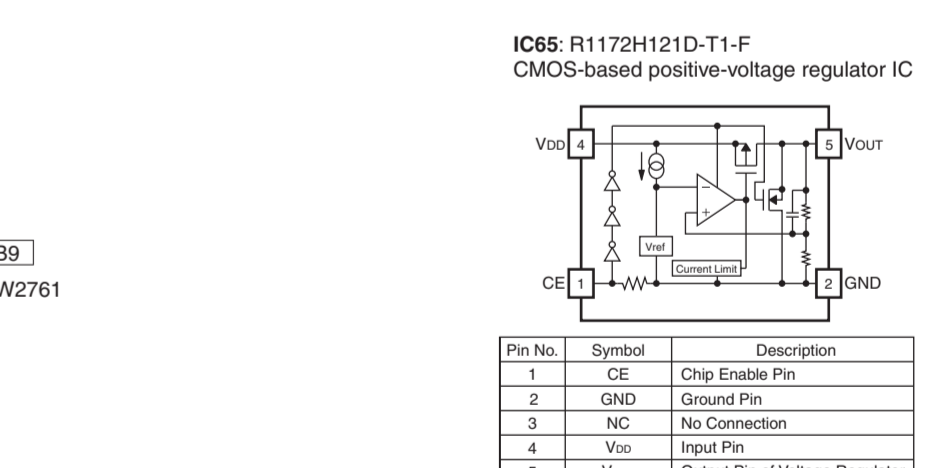
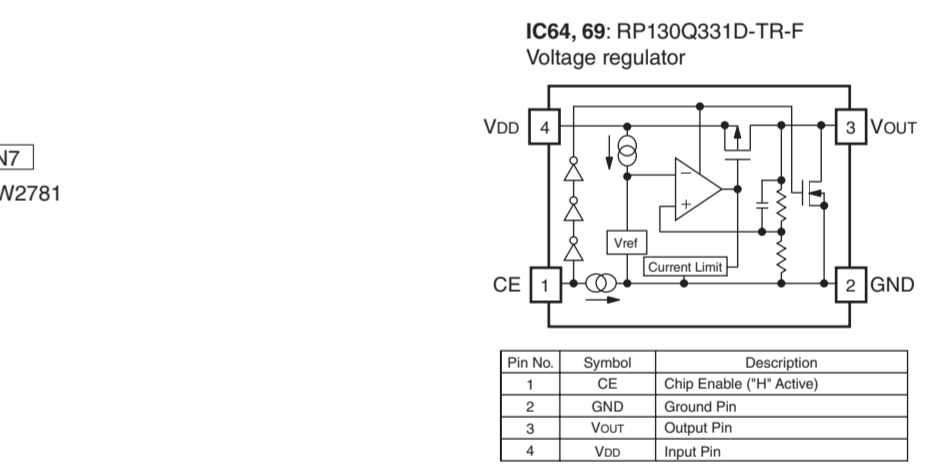
IC61: PCM9211PTR
216-kHz digital audio interface transceiver (DIX) with stereo ADC and routing



Page 76 J3
to OPERATION (4)\_CB436



Page 78 N7
to MAIN (3)\_W2781



Page 78 B9
to MAIN (9)\_W2761

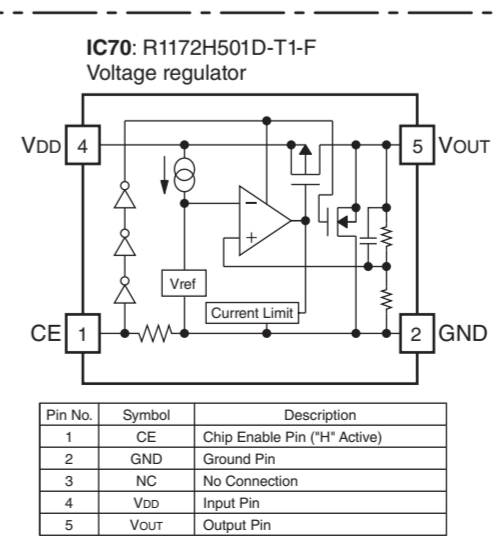
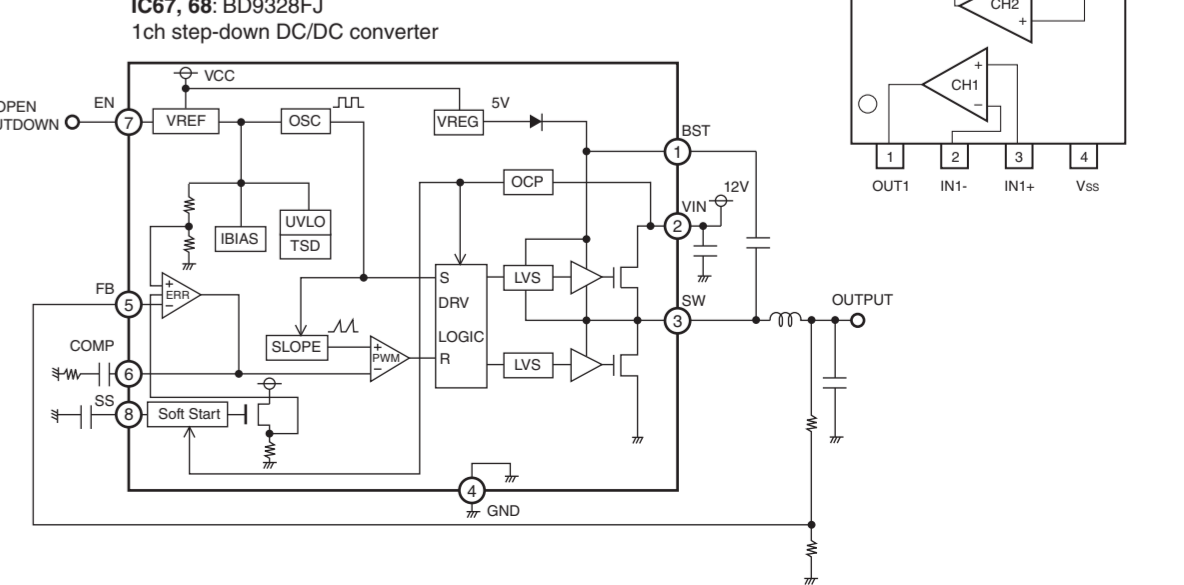
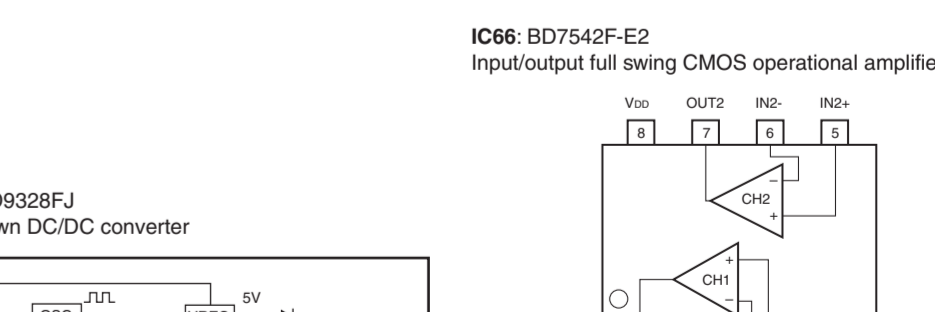


Table with 2 columns: Pin No. and Description. Lists pins 1-5 and their functions for IC70.

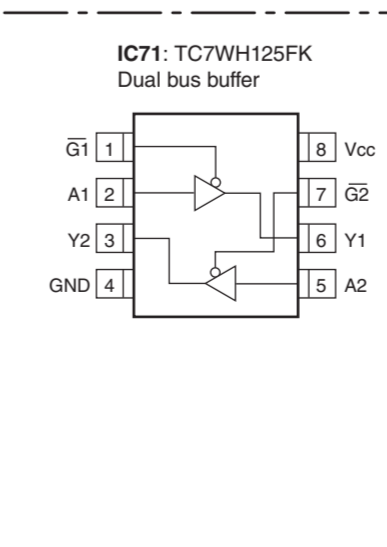
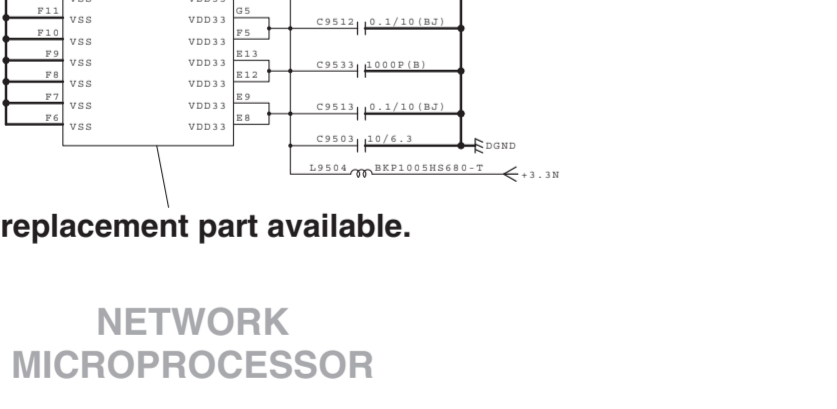
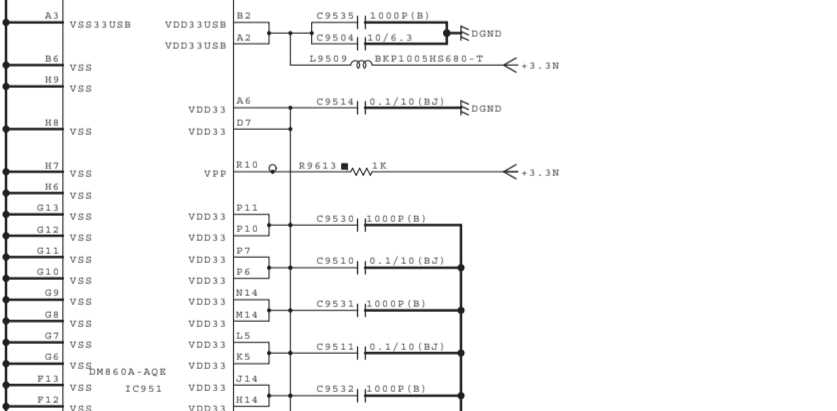
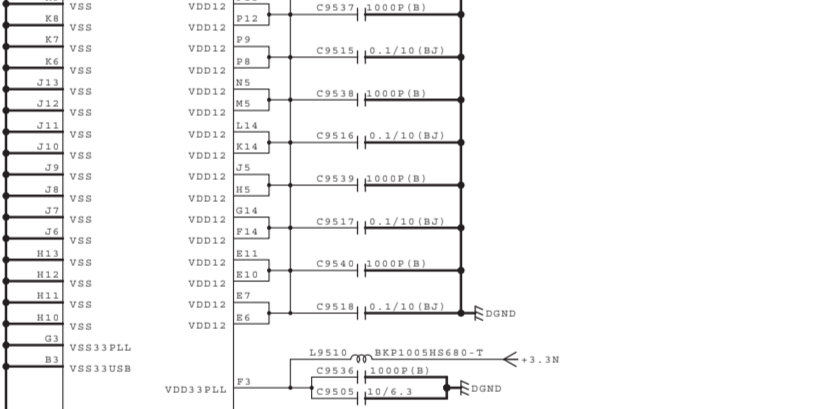
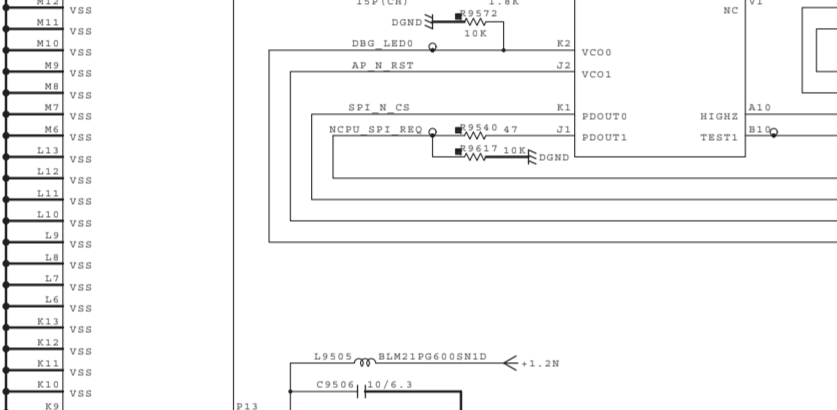
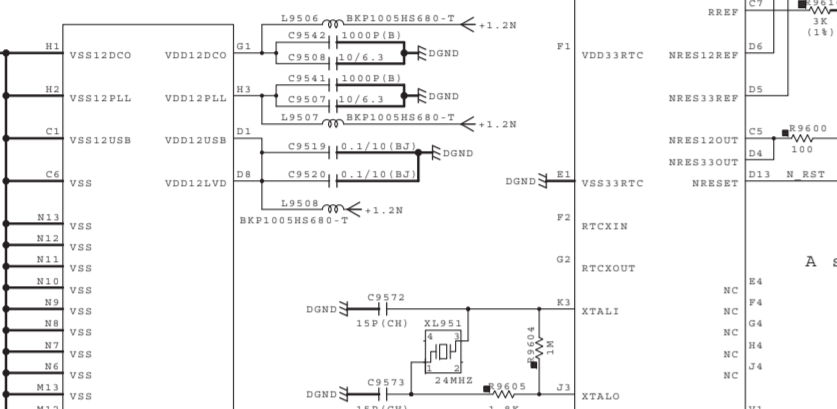
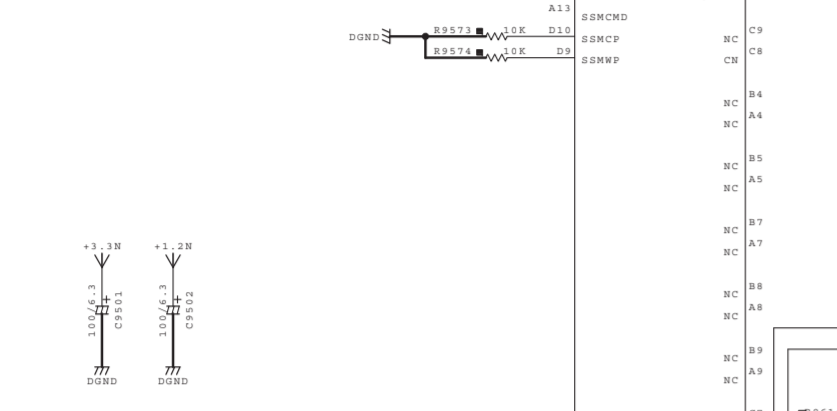
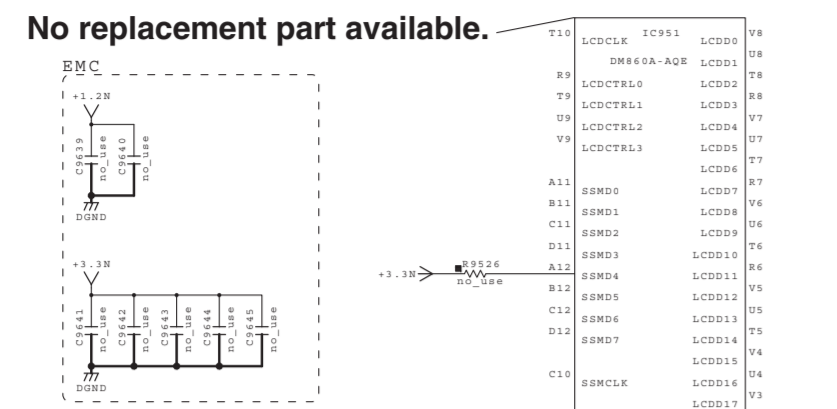


Table with 2 columns: Pin No. and Description. Lists pins 1-5 and their functions for IC71.

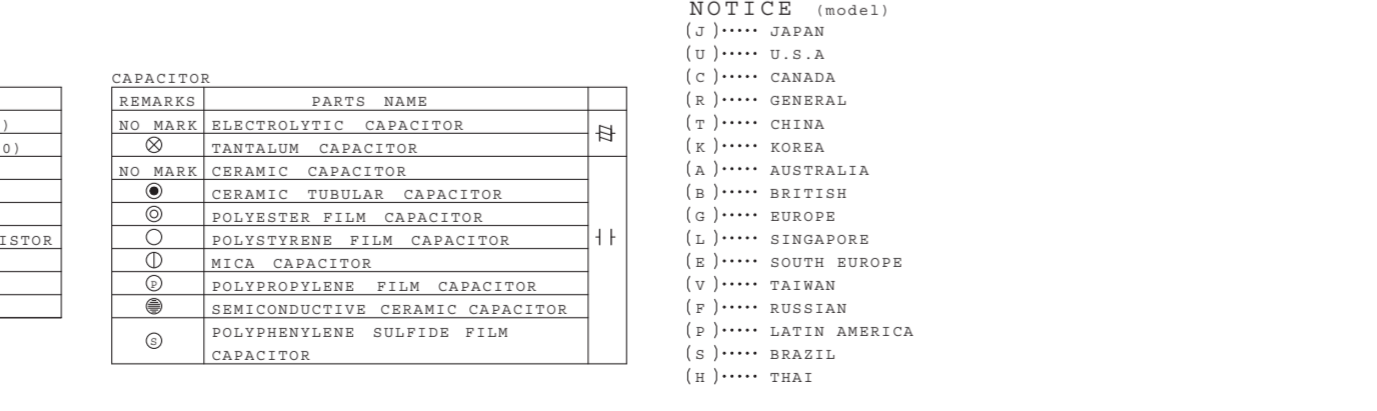
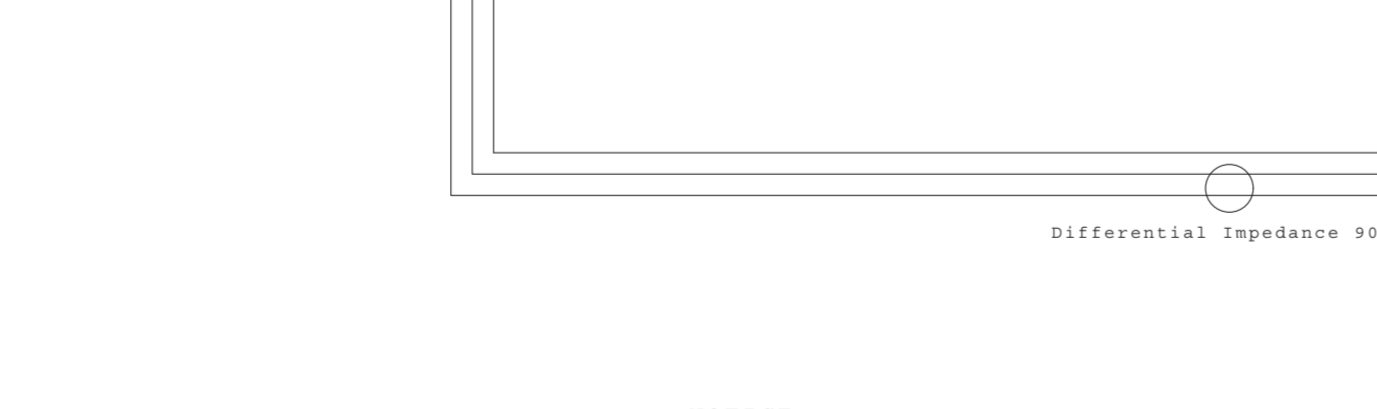
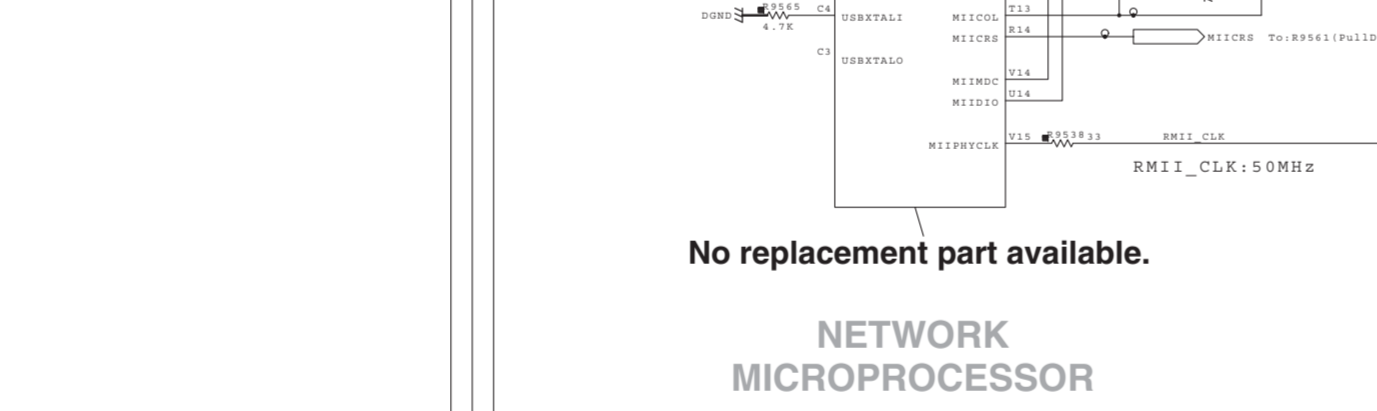
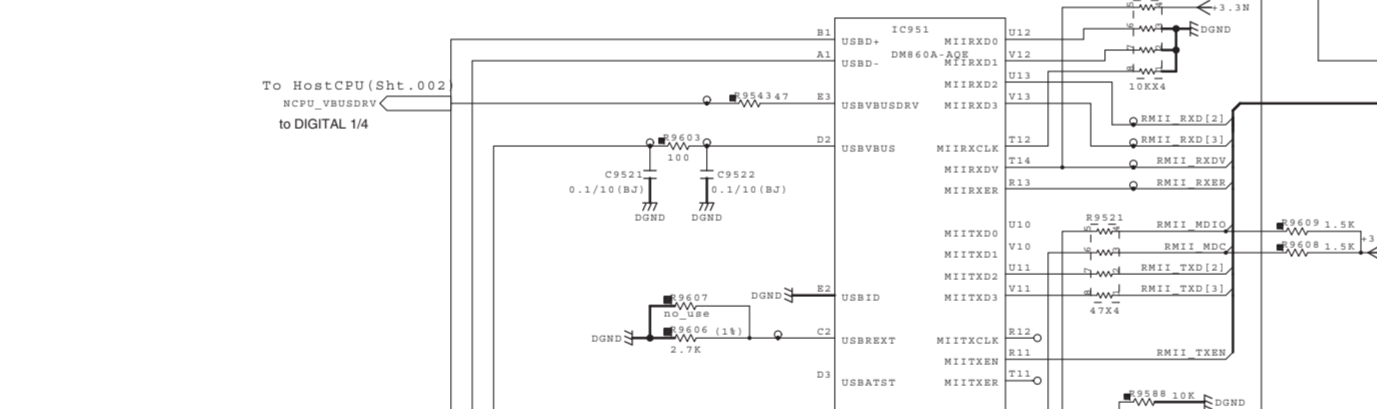
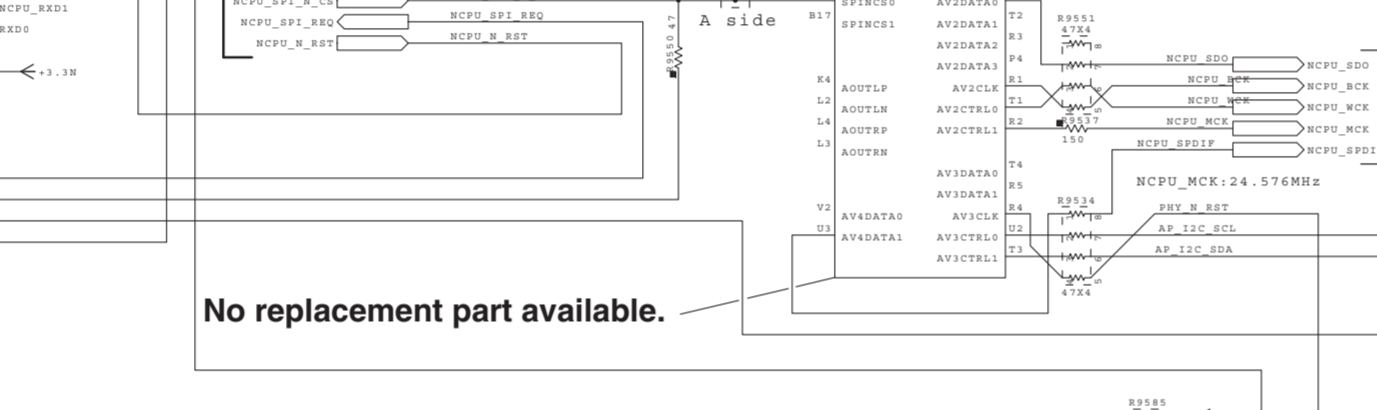
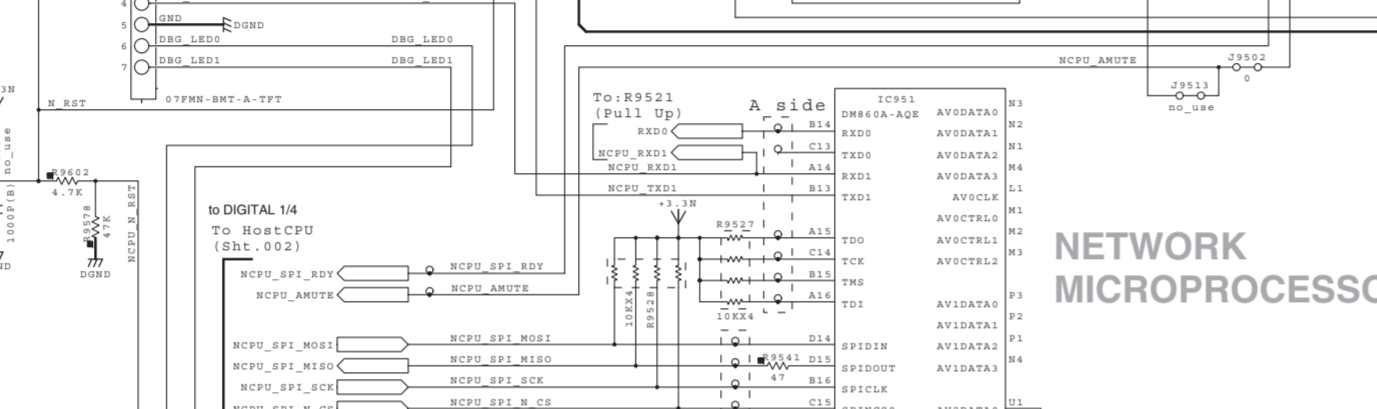
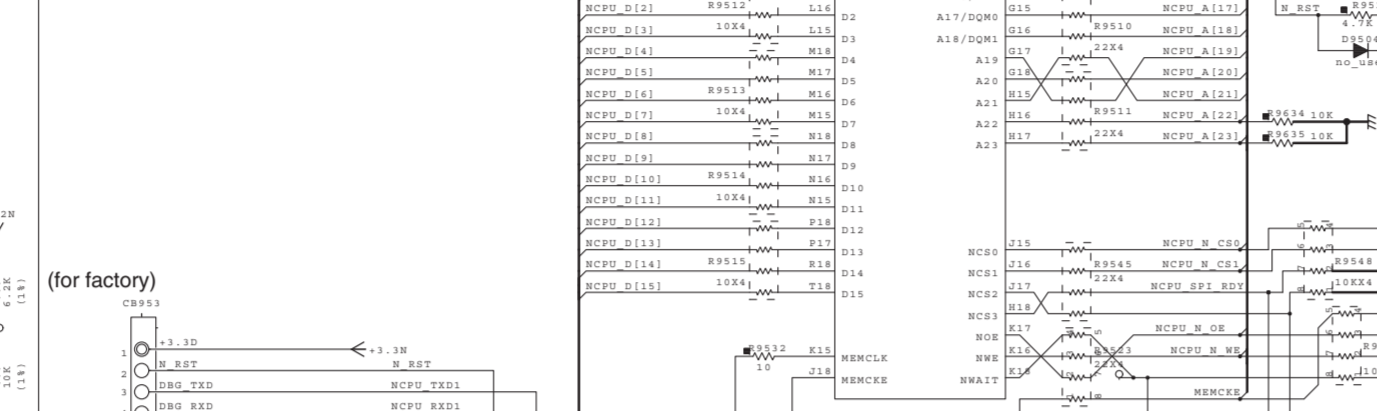
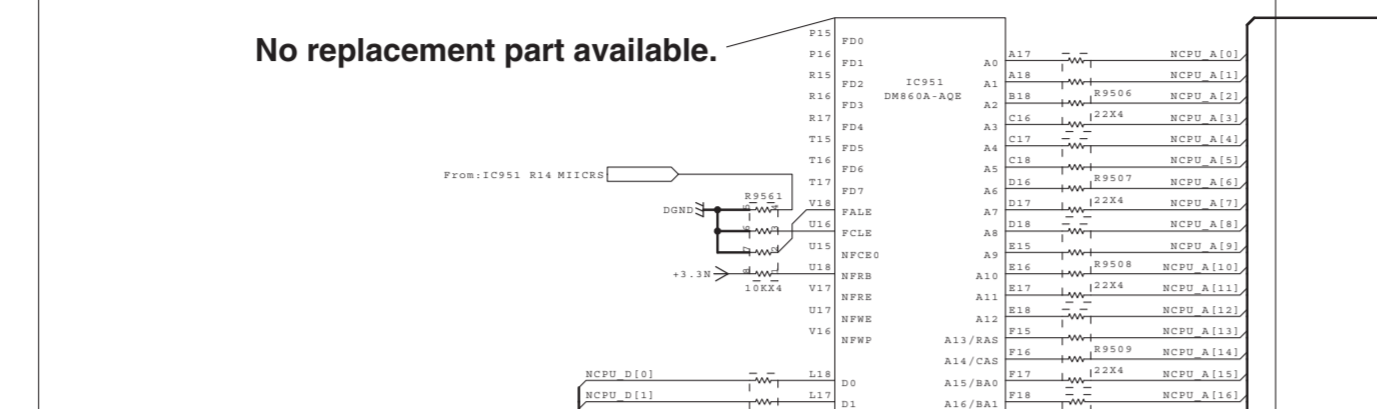
NETWORK MICROPROCESSOR



No replacement part available.

NETWORK MICROPROCESSOR

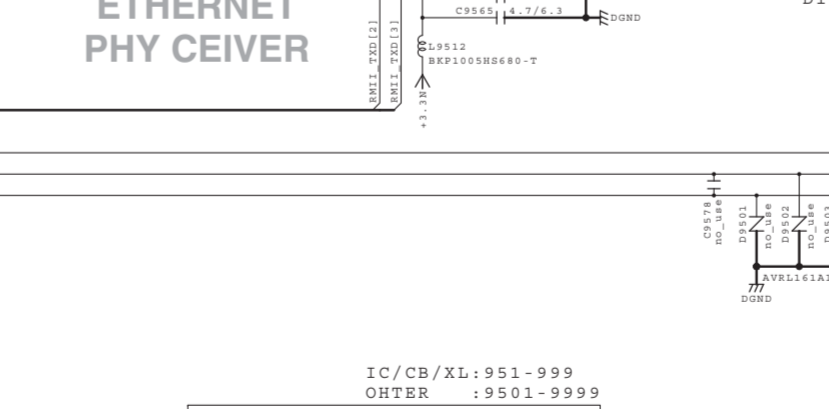
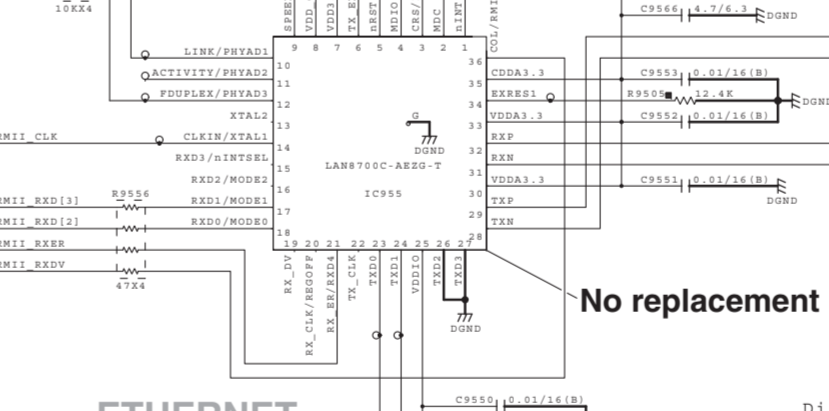
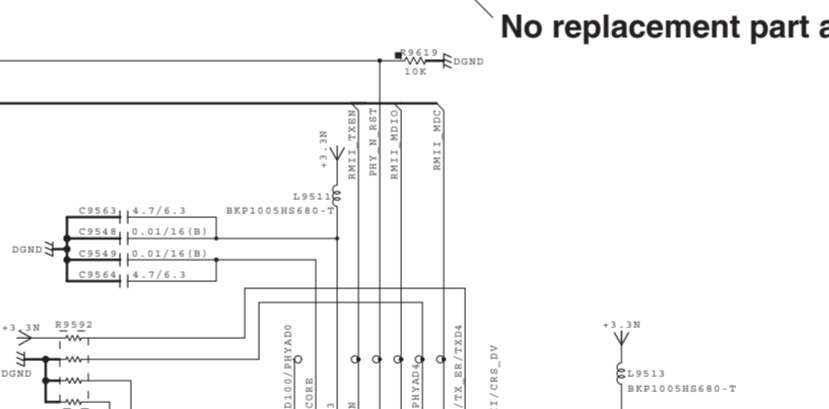
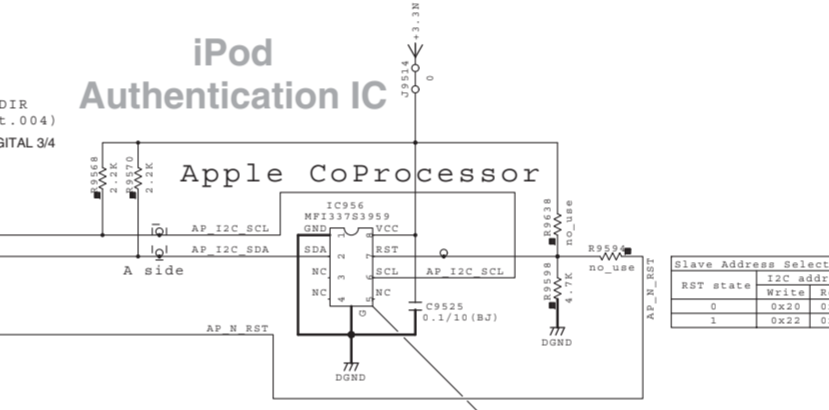
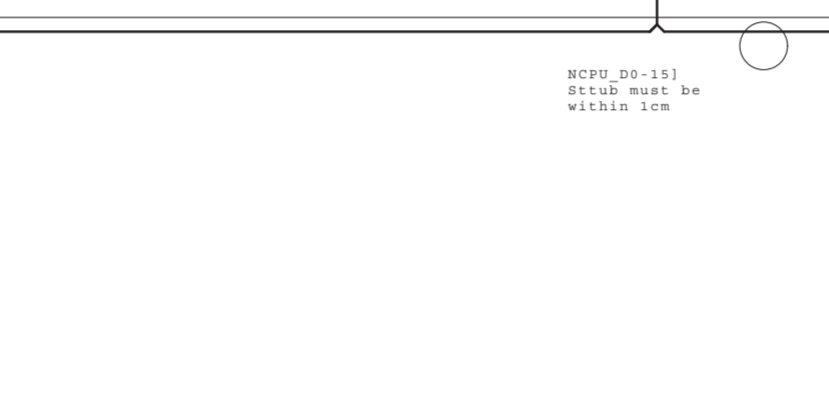
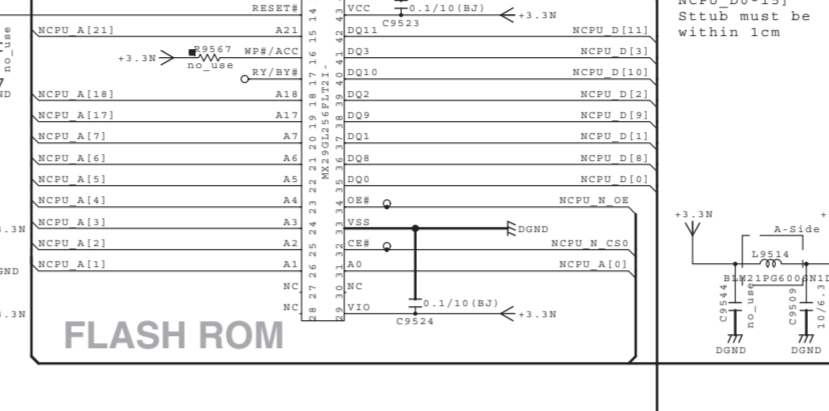
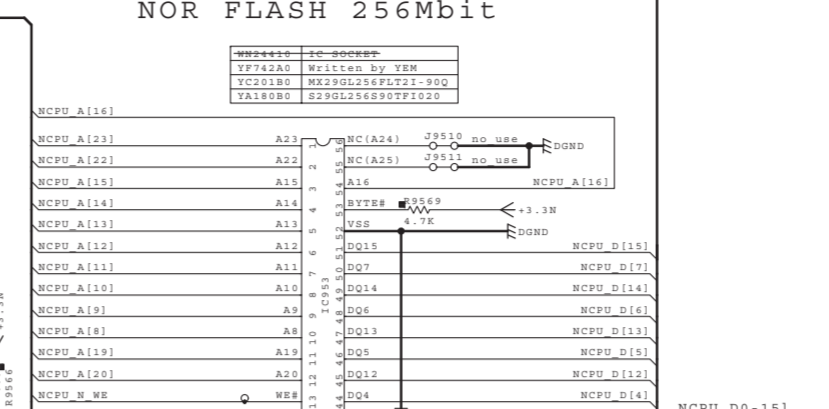
NETWORK MICROPROCESSOR



No replacement part available.

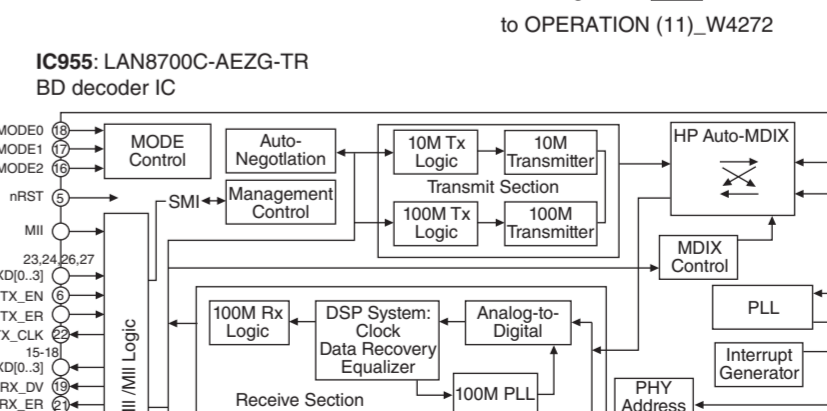
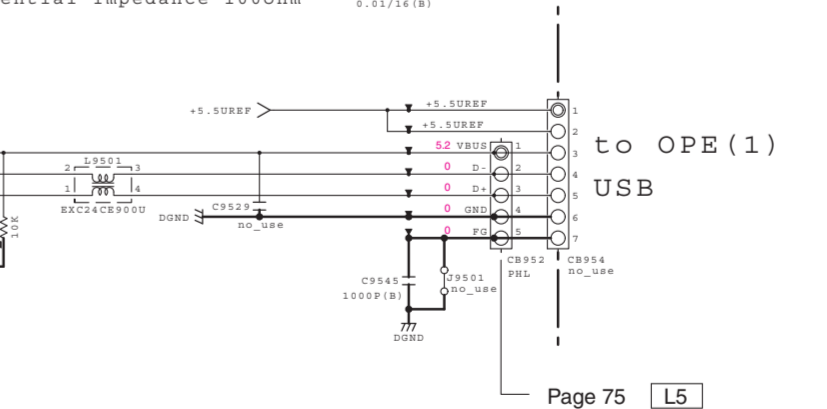
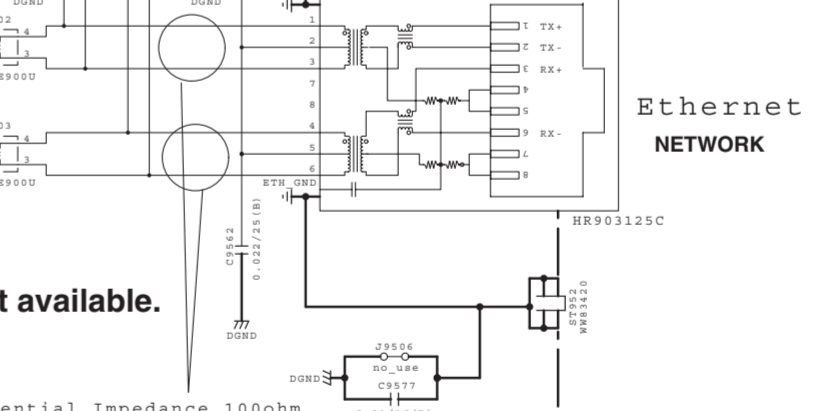
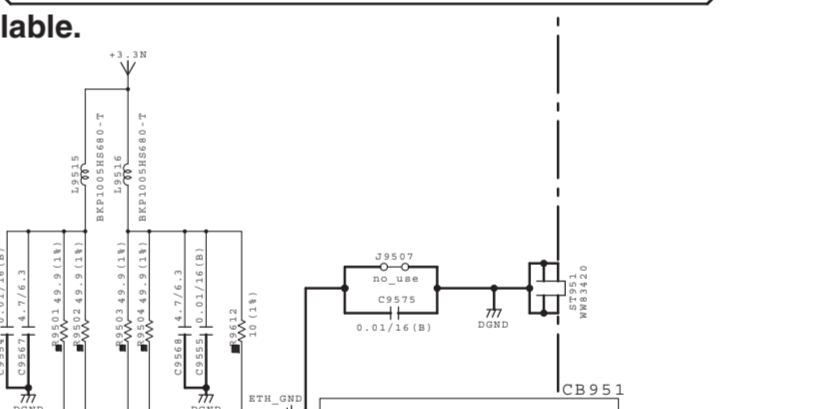
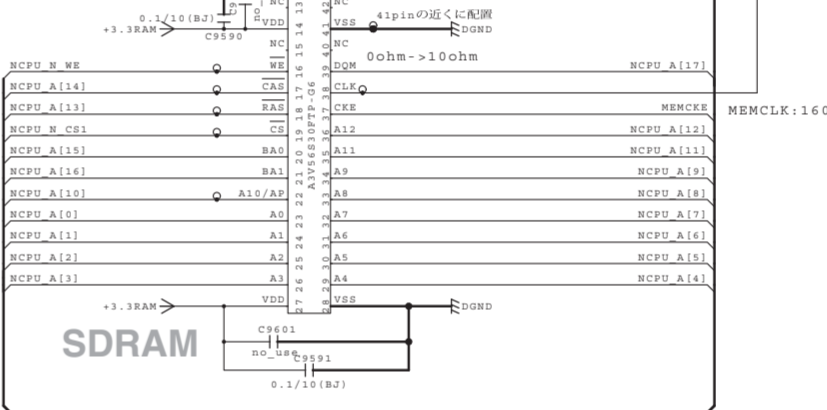
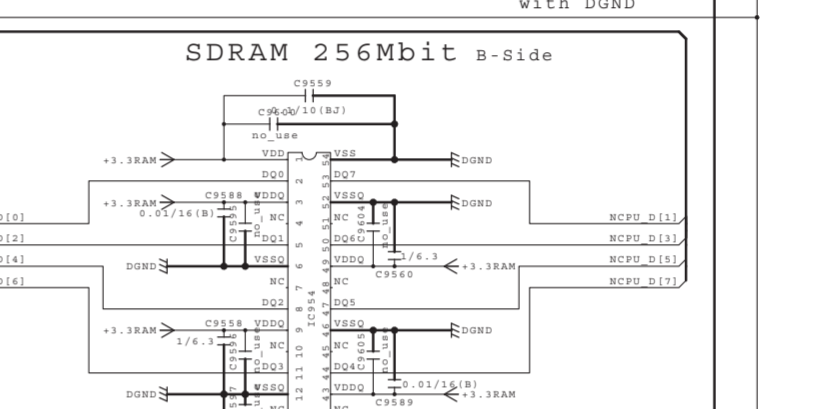
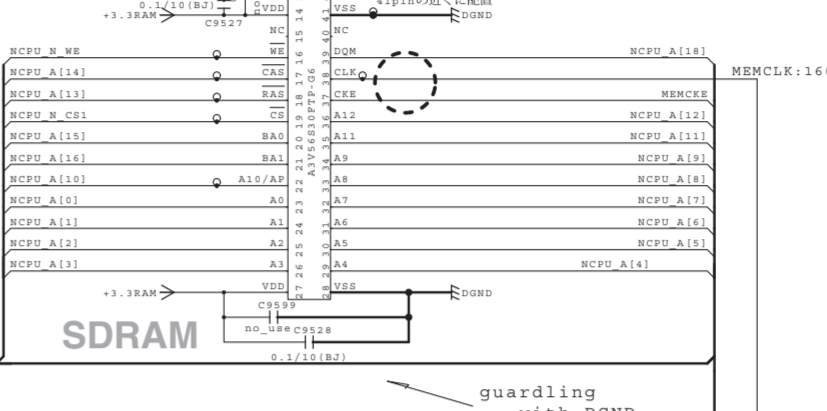
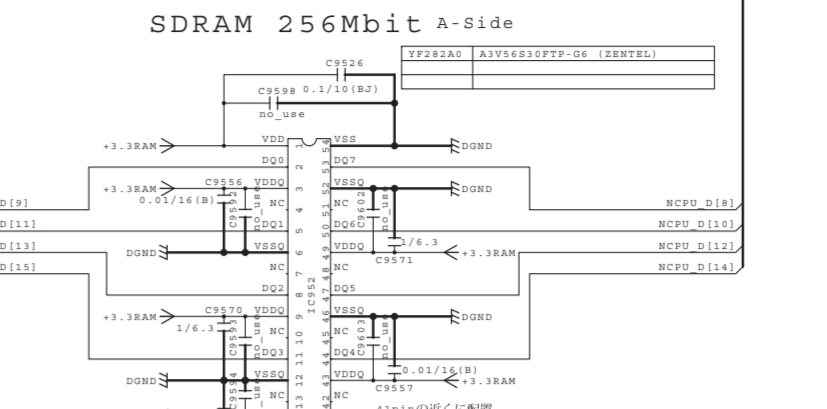
NETWORK MICROPROCESSOR

NOR FLASH 256Mbit



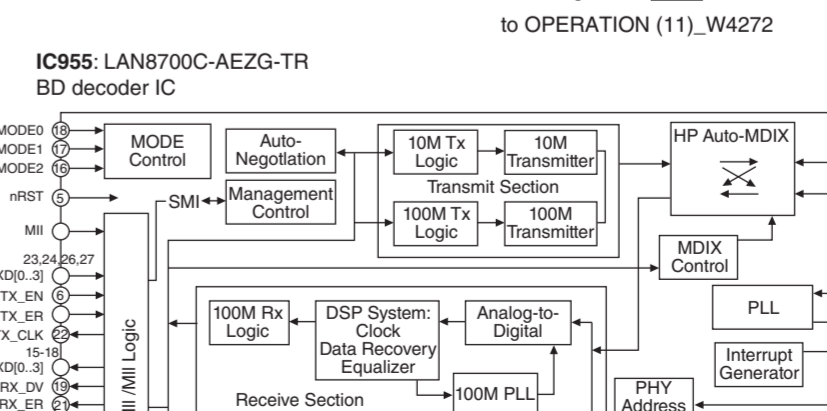
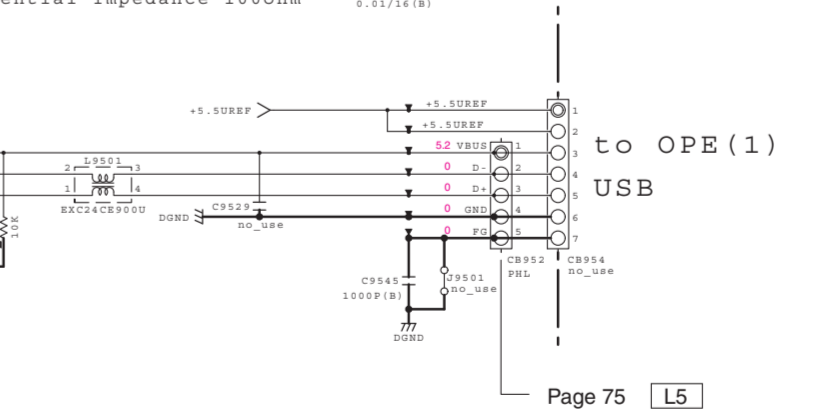
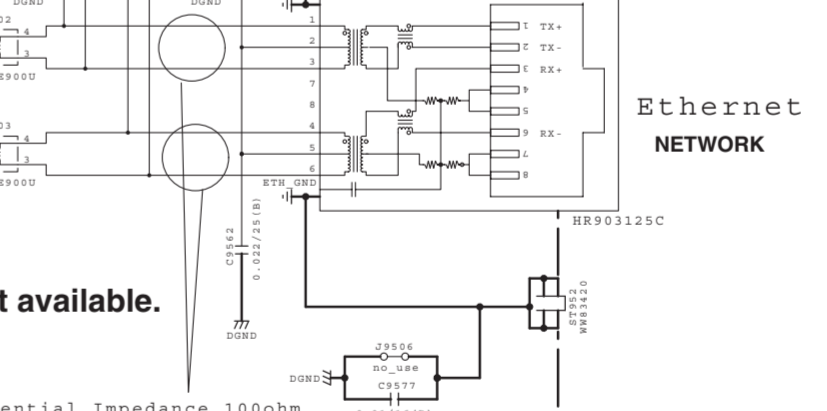
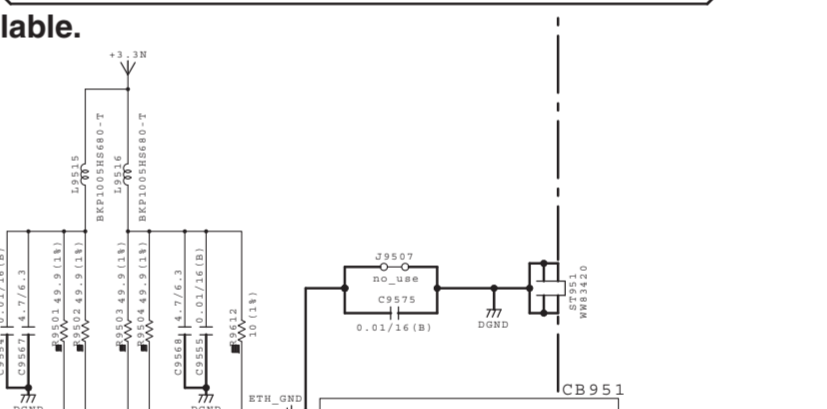
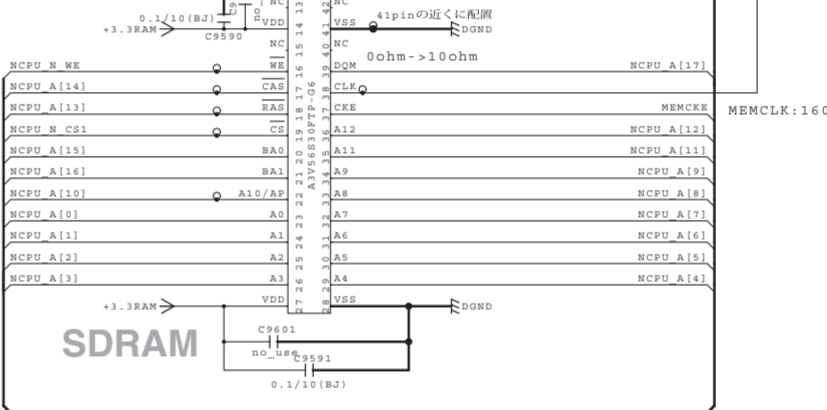
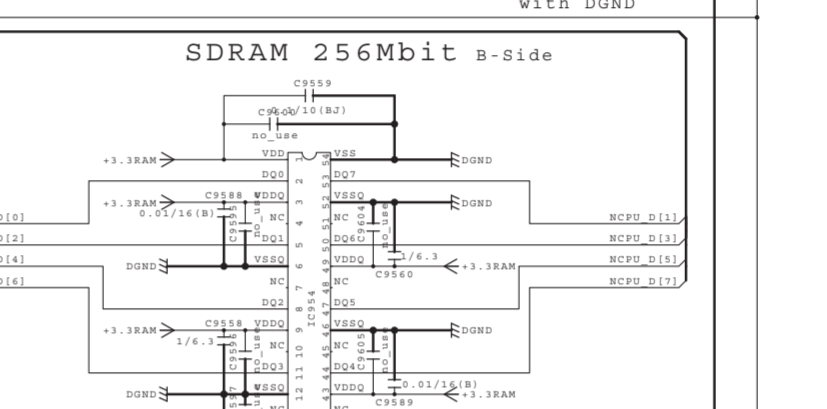
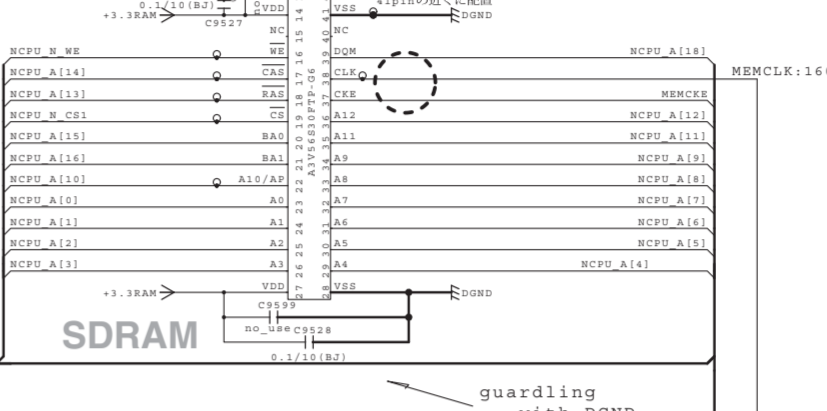
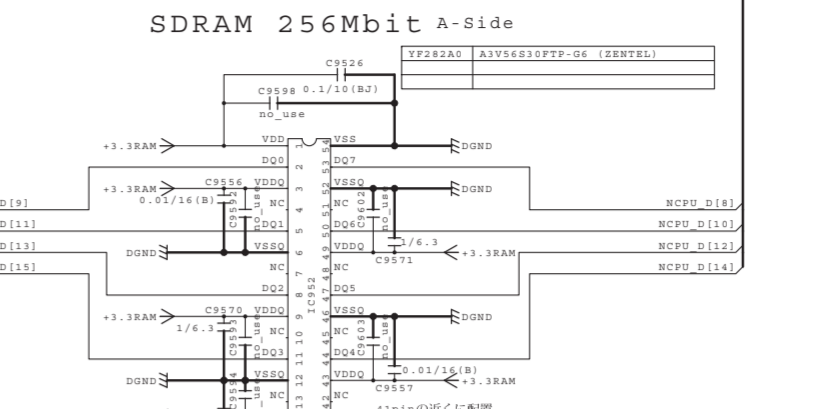
No replacement part available.

SDRAM 256Mbit A-Side



No replacement part available.

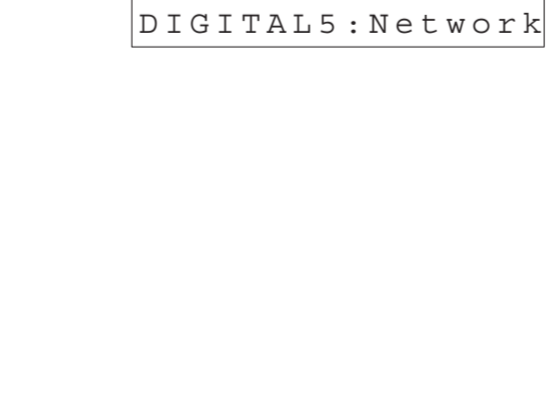
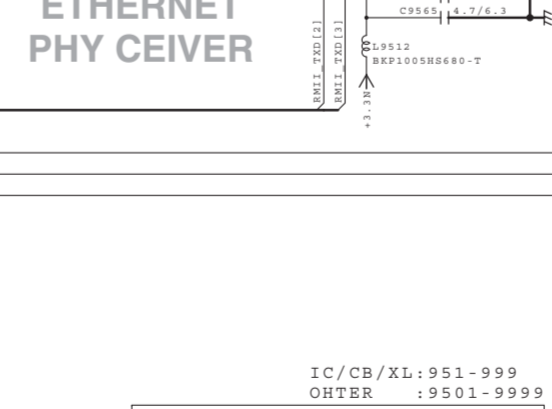
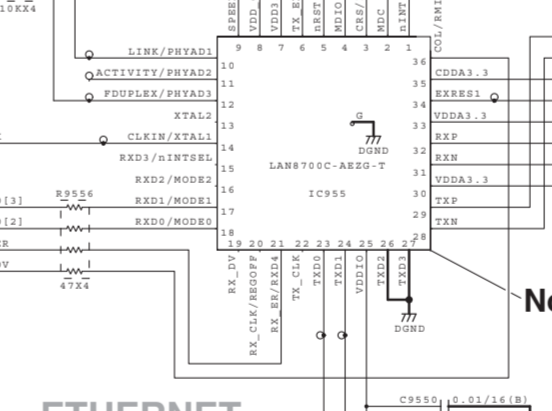
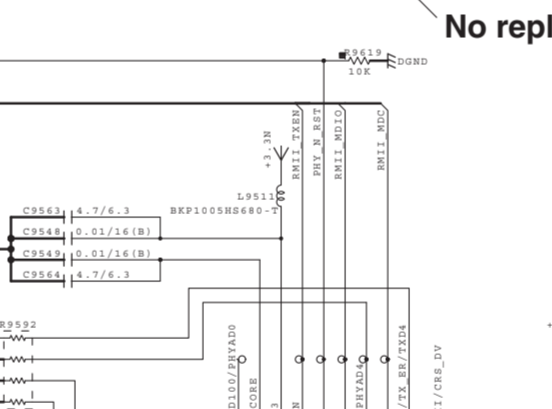
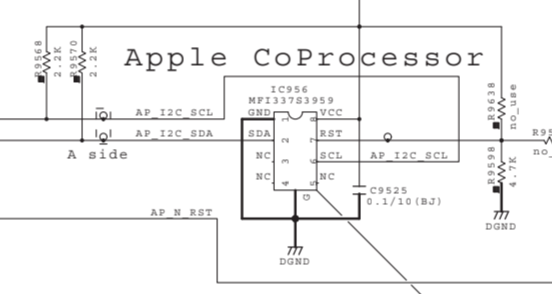
SDRAM 256Mbit B-Side



No replacement part available.

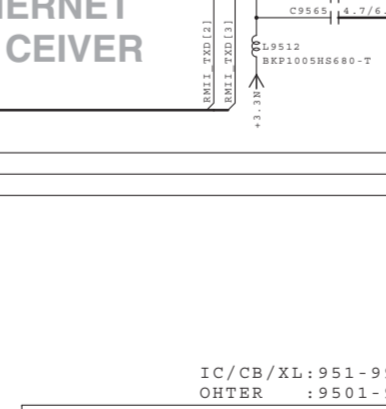
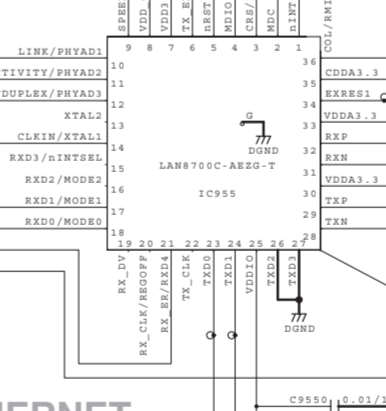
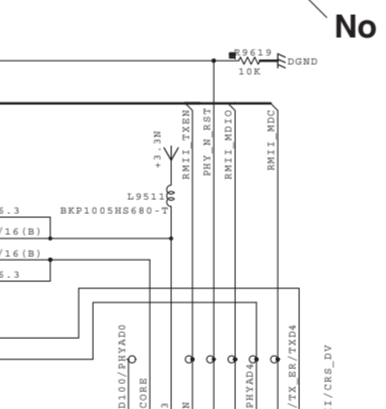
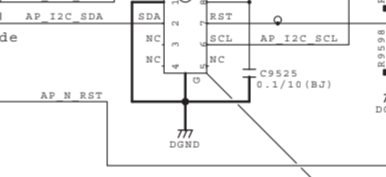
NETWORK MICROPROCESSOR

iPod Authentication IC



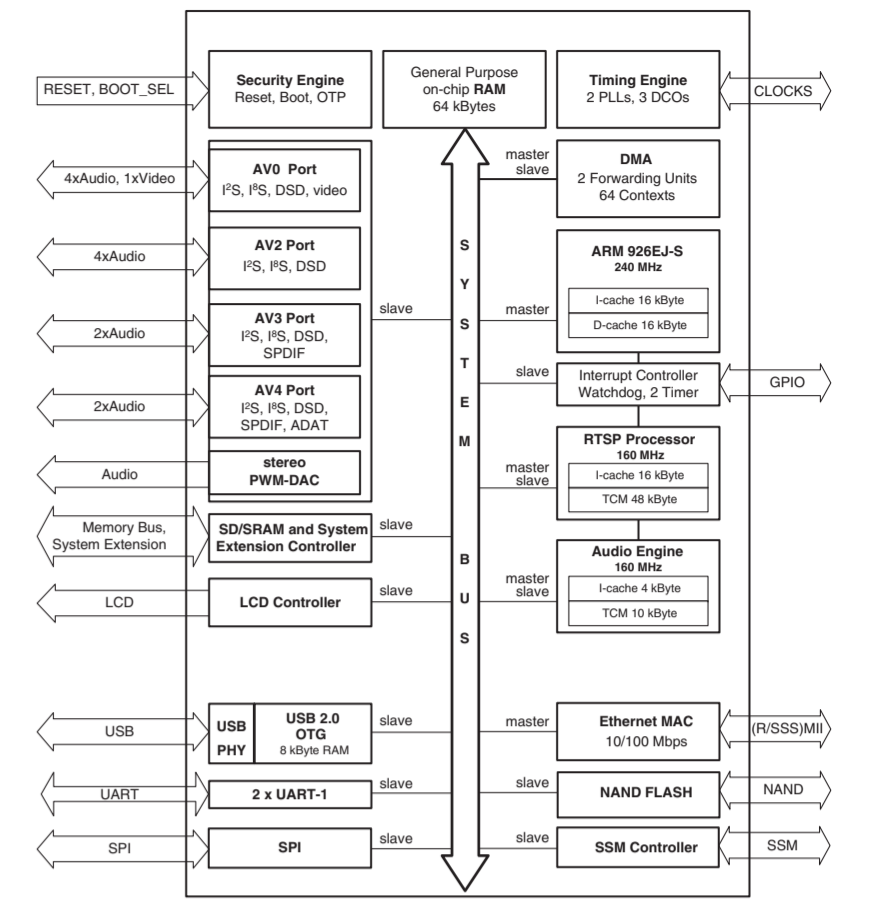
No replacement part available.

Apple CoProcessor

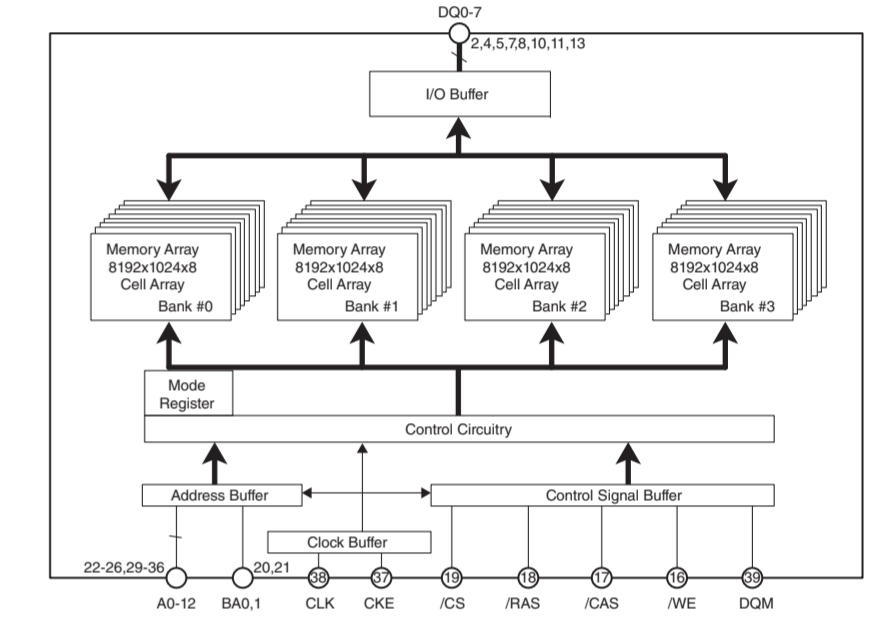


No replacement part available.

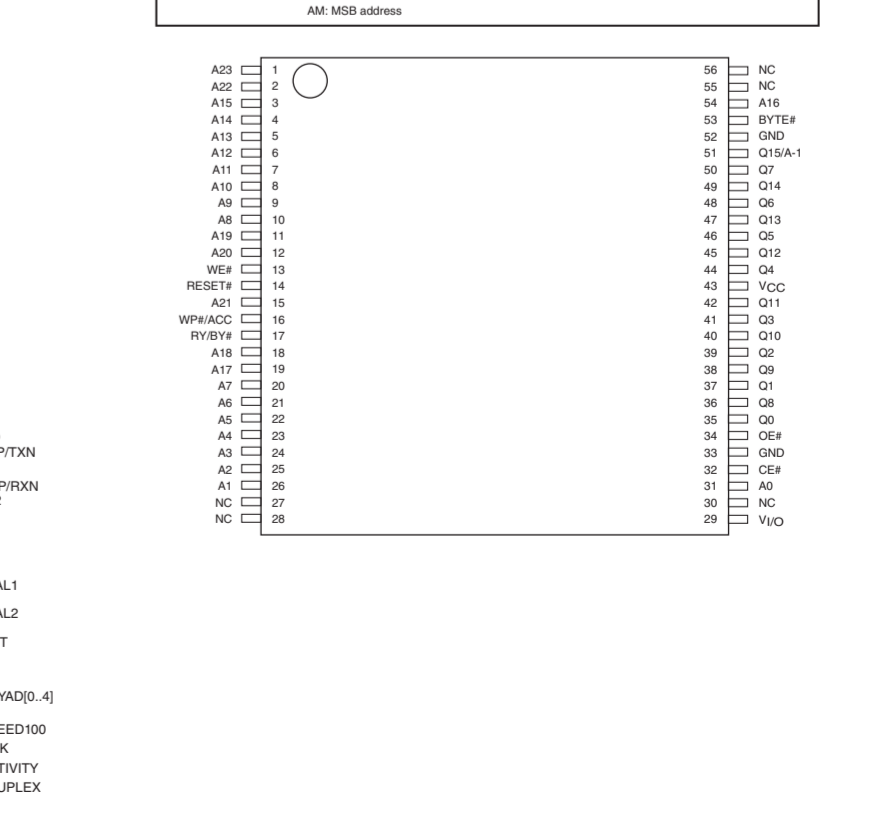
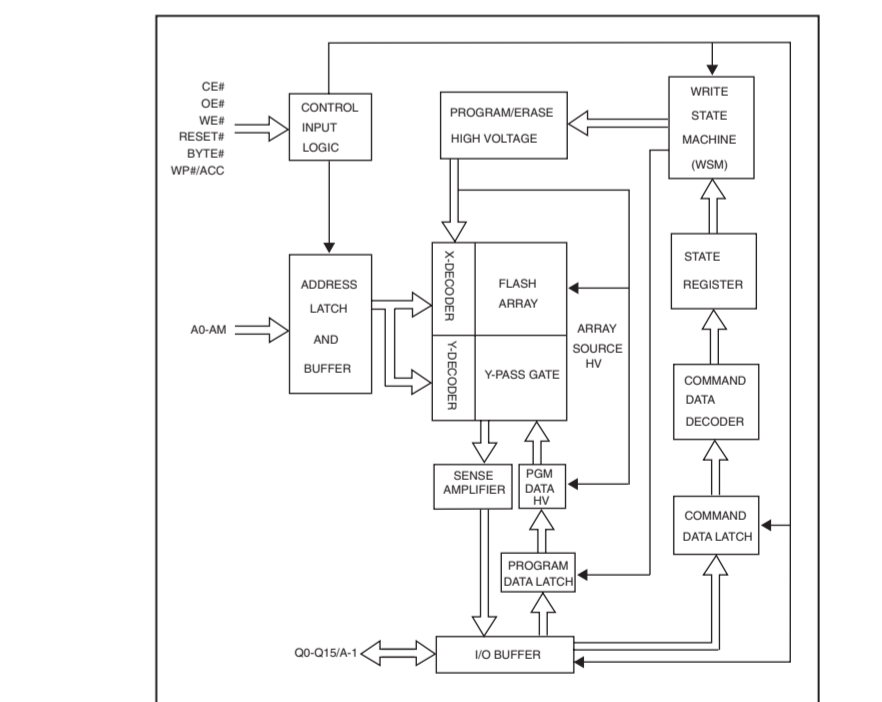
IC951: DM960A-AQE Network microprocessor



IC952: 954: A3V56S30FTP-G6 256 Mb synchronous DRAM



IC953: MX29GL256FLT1-90Q Signal voltage 3V only flash memory



NOTICE (model) (J) JAPAN (U) U.S.A. (C) CANADA (R) GENERAL (F) FRANCE (K) KOREA (A) AUSTRALIA (B) BRITISH (O) EUROPE (L) SINGAPORE (E) SOUTH EUROPE (V) TAIWAN (P) LATIN AMERICA (G) BRAZIL (H) THAI

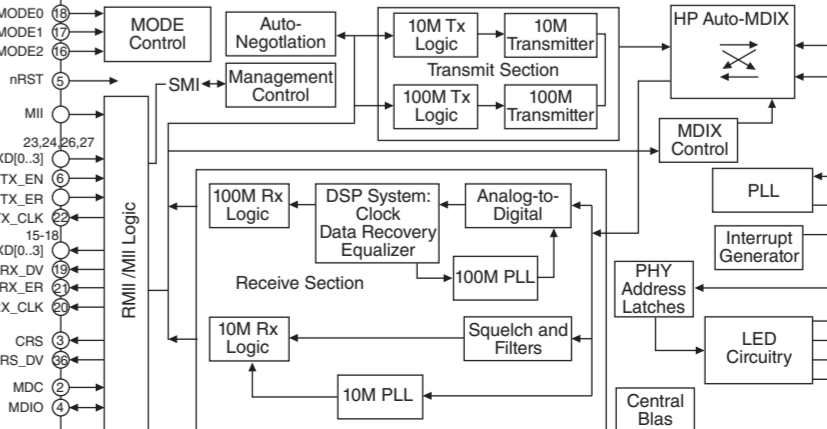
Table with 2 columns: REMARKS, PARTS NAME. Lists various resistor types like CARBON FILM RESISTOR, METAL OXIDE FILM RESISTOR, etc.

Table with 2 columns: REMARKS, PARTS NAME. Lists various capacitor types like TANTALUM CAPACITOR, CERAMIC CAPACITOR, POLYESTER FILM CAPACITOR, etc.

IC/CB/XL:951-999 OHTER: 9501-9999 DIGITAL5: Network

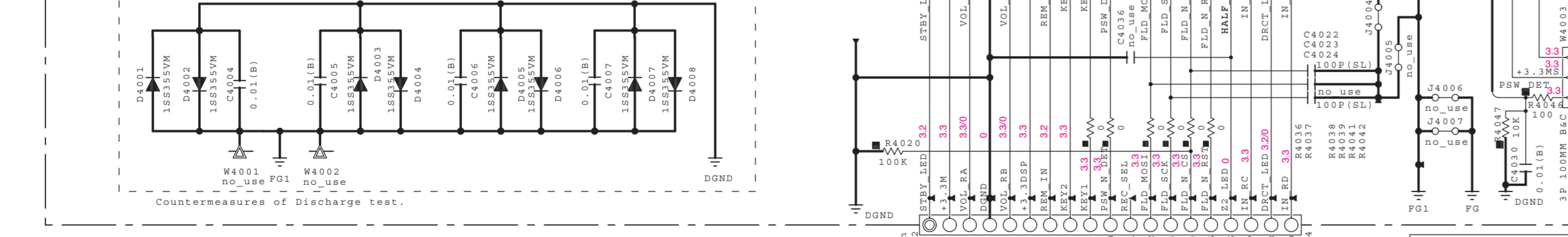
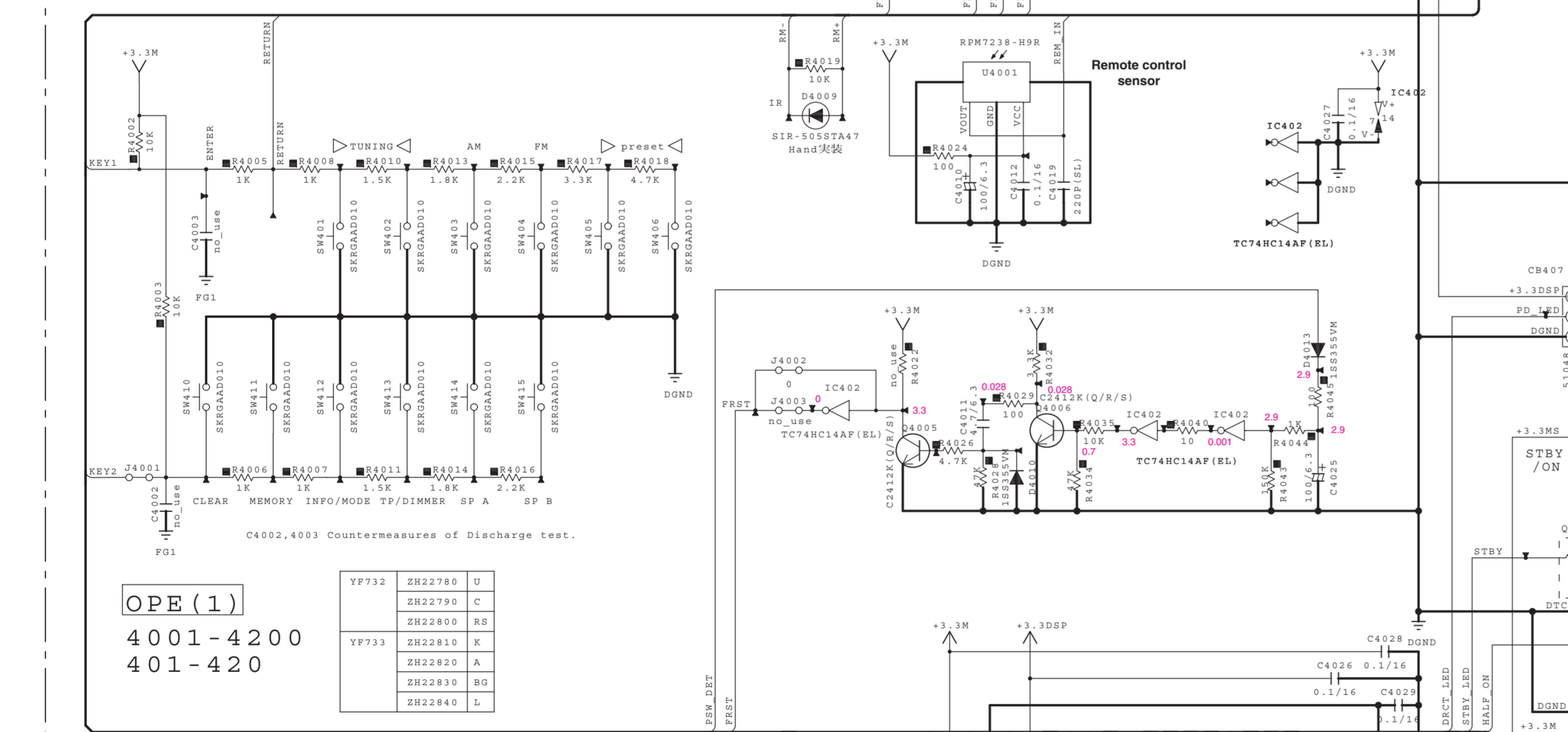
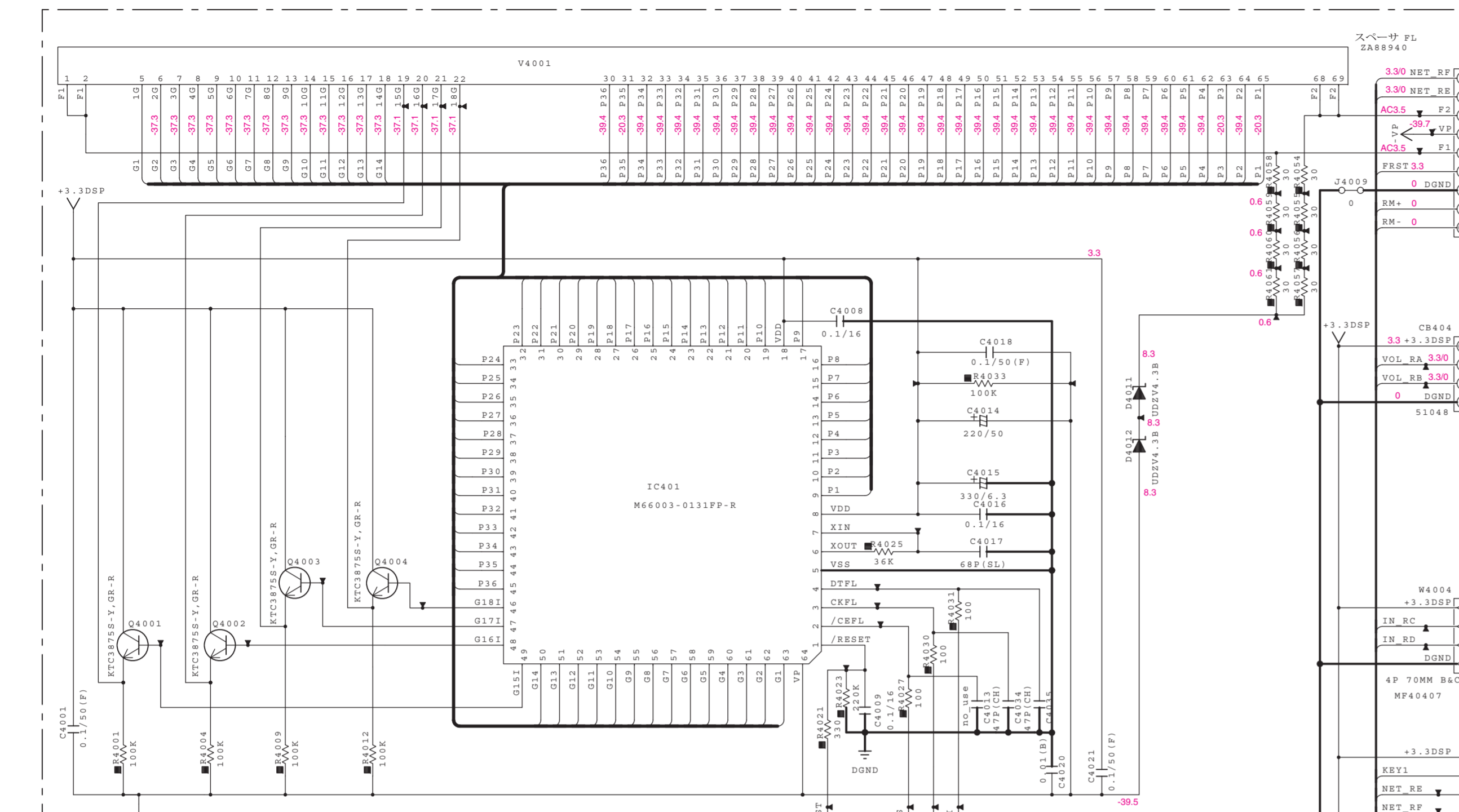
Page 75 L5 to OPERATION (11)\_W4272

IC955: LAN8700C-AEZG-TR BD decoder IC



All voltages are measured with a 10MΩ/V DC electronic voltmeter. Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed. Schematic diagram is subject to change without notice.

OPERATION 1/3



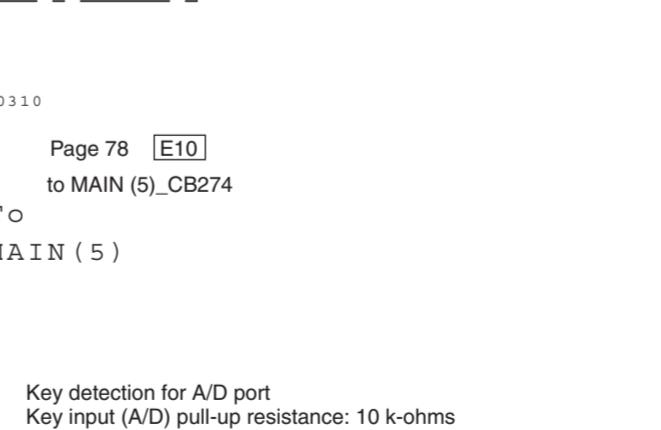
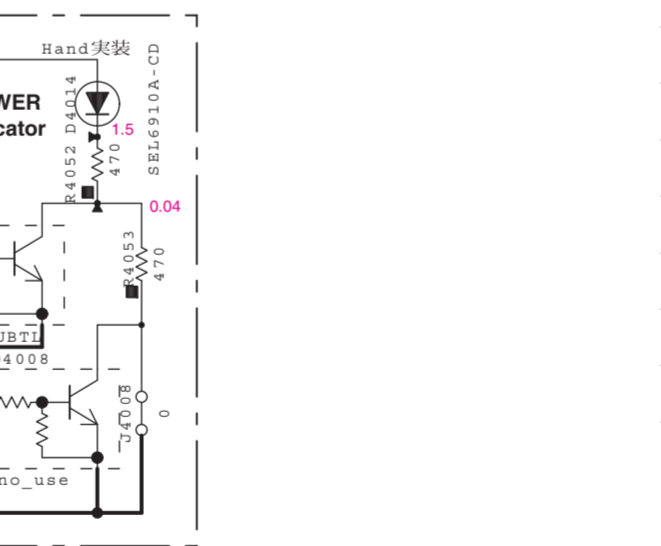
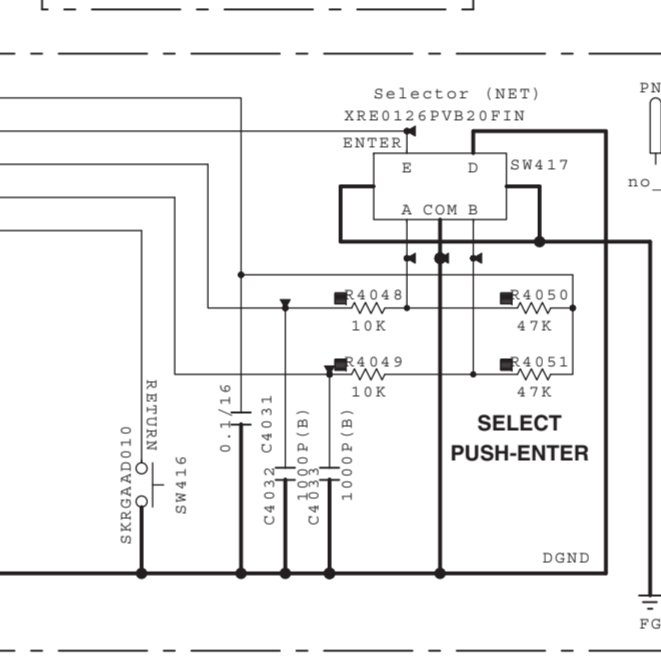
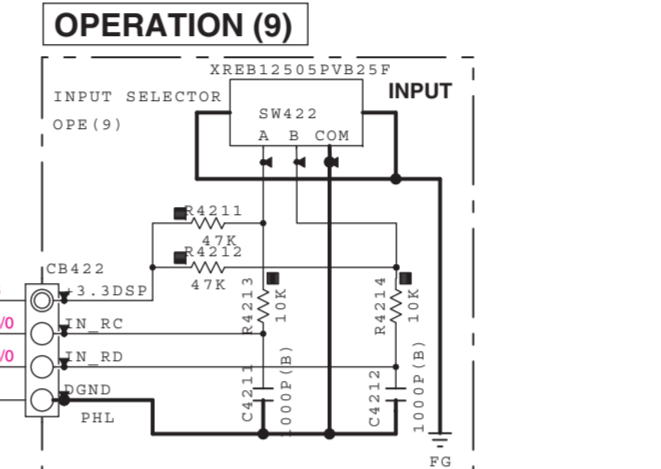
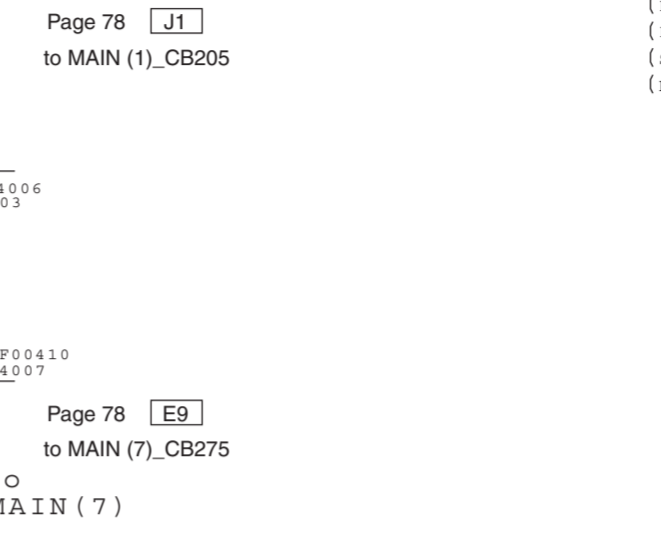
Page 71 [C1] to DIGITAL\_CB21

\* All voltages are measured with a 10MΩV DC electronic voltmeter.
\* Components having special characteristics are marked Δ, and must be replaced with parts having specifications equal to those originally installed.
\* Schematic diagram is subject to change without notice.

NOTICE (model)
(J)..... JAPAN
(U)..... U.S.A
(C)..... CANADA
(R)..... GENERAL
(T)..... CHINA
(K)..... KOREA
(A)..... AUSTRALIA
(B)..... BRITISH
(E)..... EUROPE
(L)..... SINGAPORE
(V)..... SOUTH EUROPE
(W)..... TAIWAN
(F)..... RUSSIAN
(P)..... LATIN AMERICA
(S)..... BRAZIL
(H)..... THAI

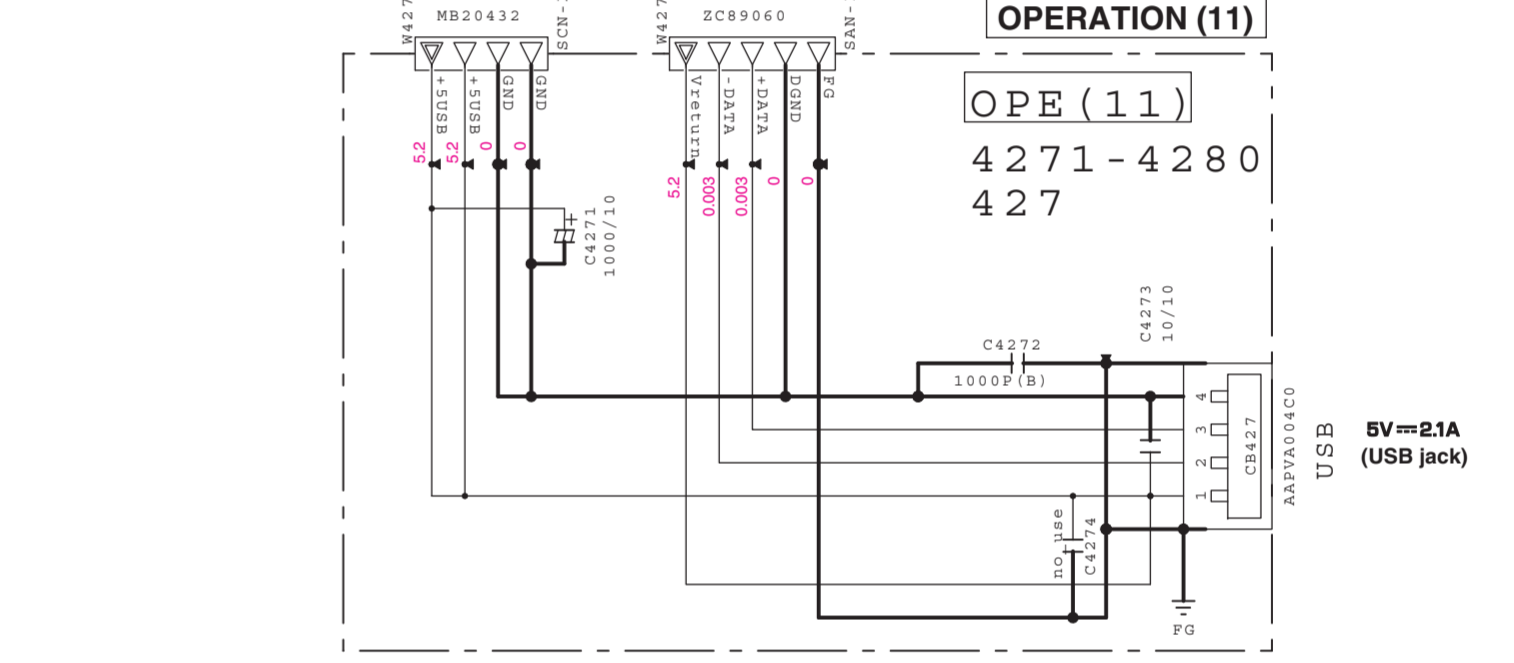
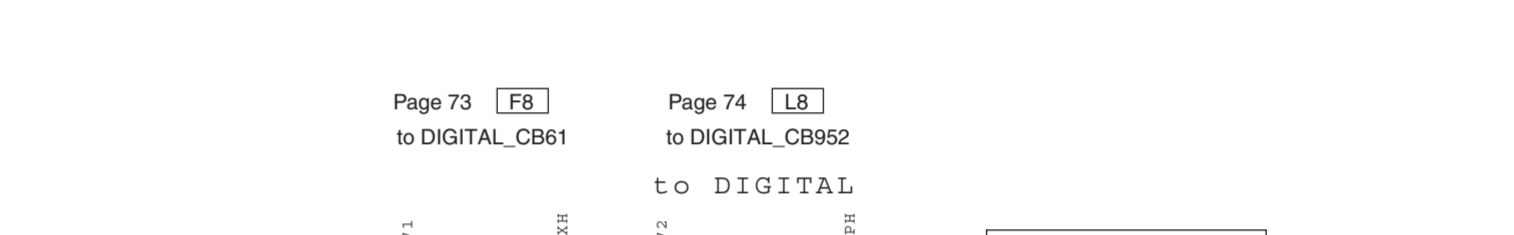
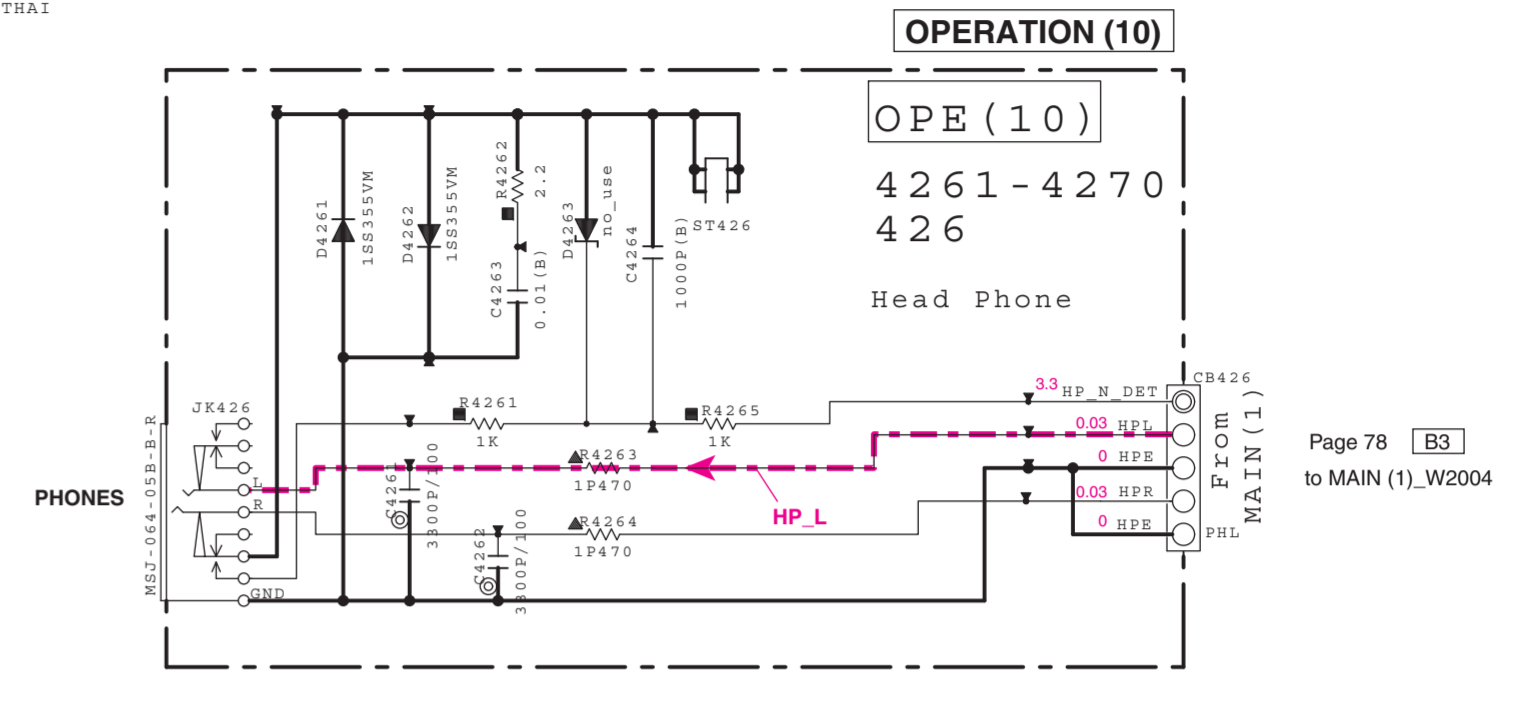
Table with 2 columns: REMARKS and PARTS NAME. Lists various capacitor types like ELECTROLYTIC CAPACITOR, TANTALUM CAPACITOR, CERAMIC CAPACITOR, etc.

Table with 2 columns: REMARKS and PARTS NAME. Lists various resistor types like CARBON FILM RESISTOR, METAL OXIDE FILM RESISTOR, METAL PLATE RESISTOR, etc.

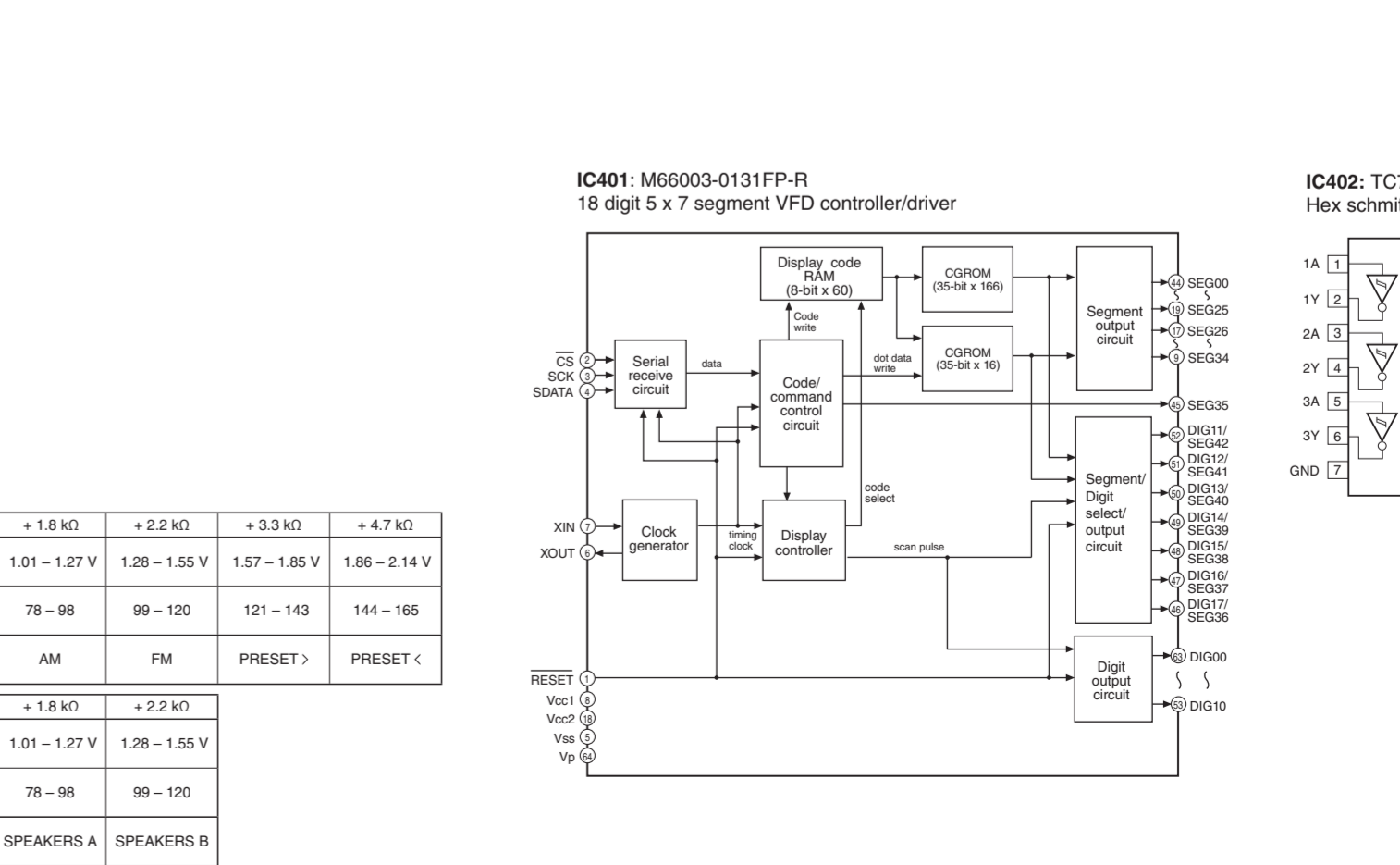


Page 78 [E10] to MAIN (5)\_CB274

Table for Key detection for A/D port. It lists detected voltage values and A/D values for various keys (KEY1, KEY2) and their corresponding functions.



Destination Part List table with columns for destination part numbers and their corresponding part numbers.



OPERATION 2/3

PHONO

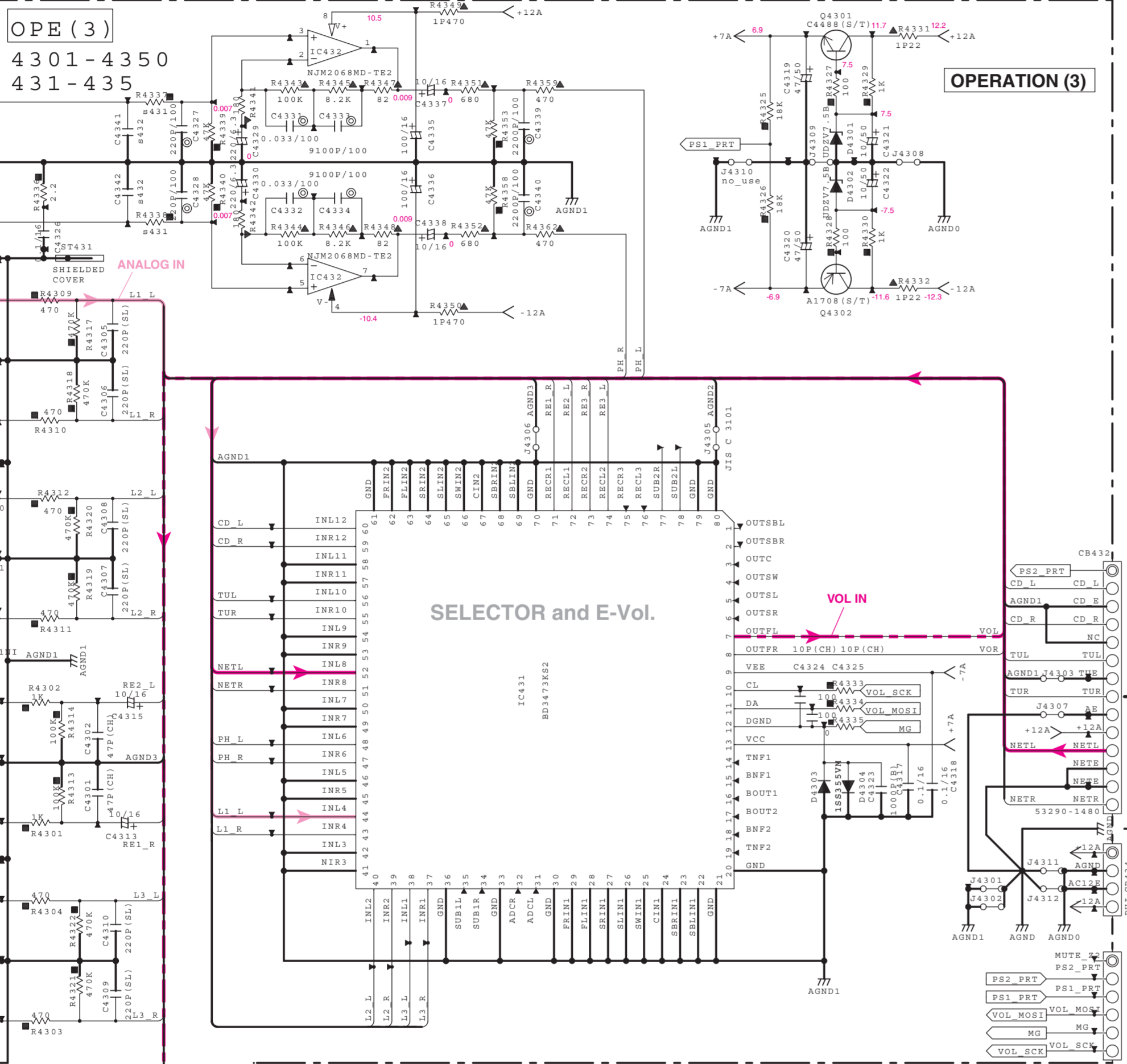
PB LINE 1

PB LINE 2

LINE REC LINE2 OUT

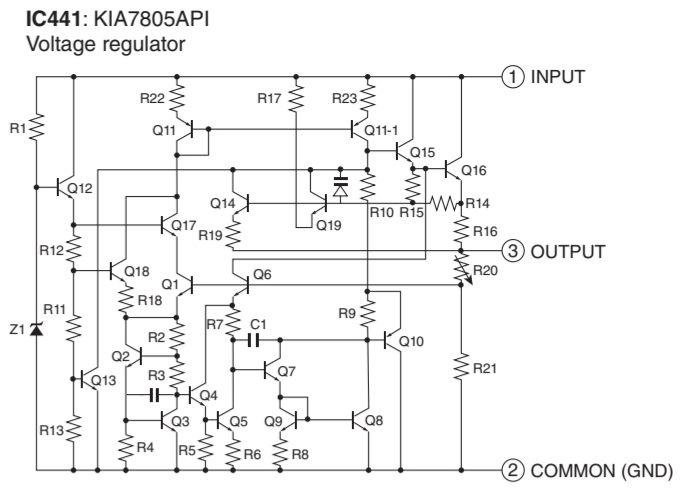
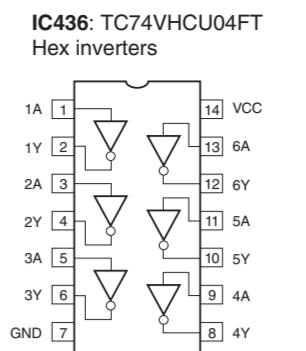
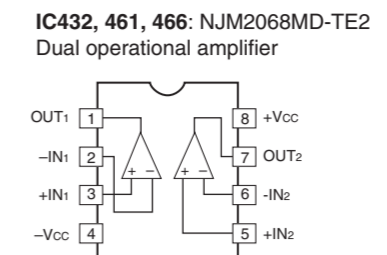
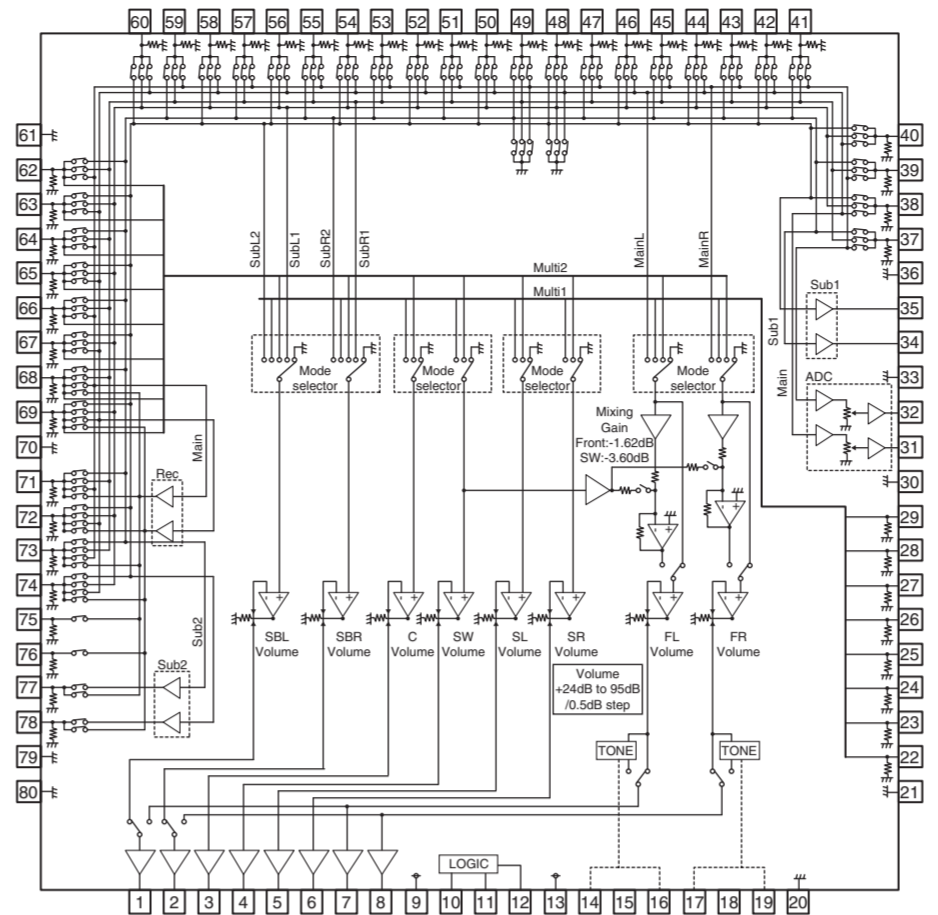
PB LINE 3

REC LINE3 OUT

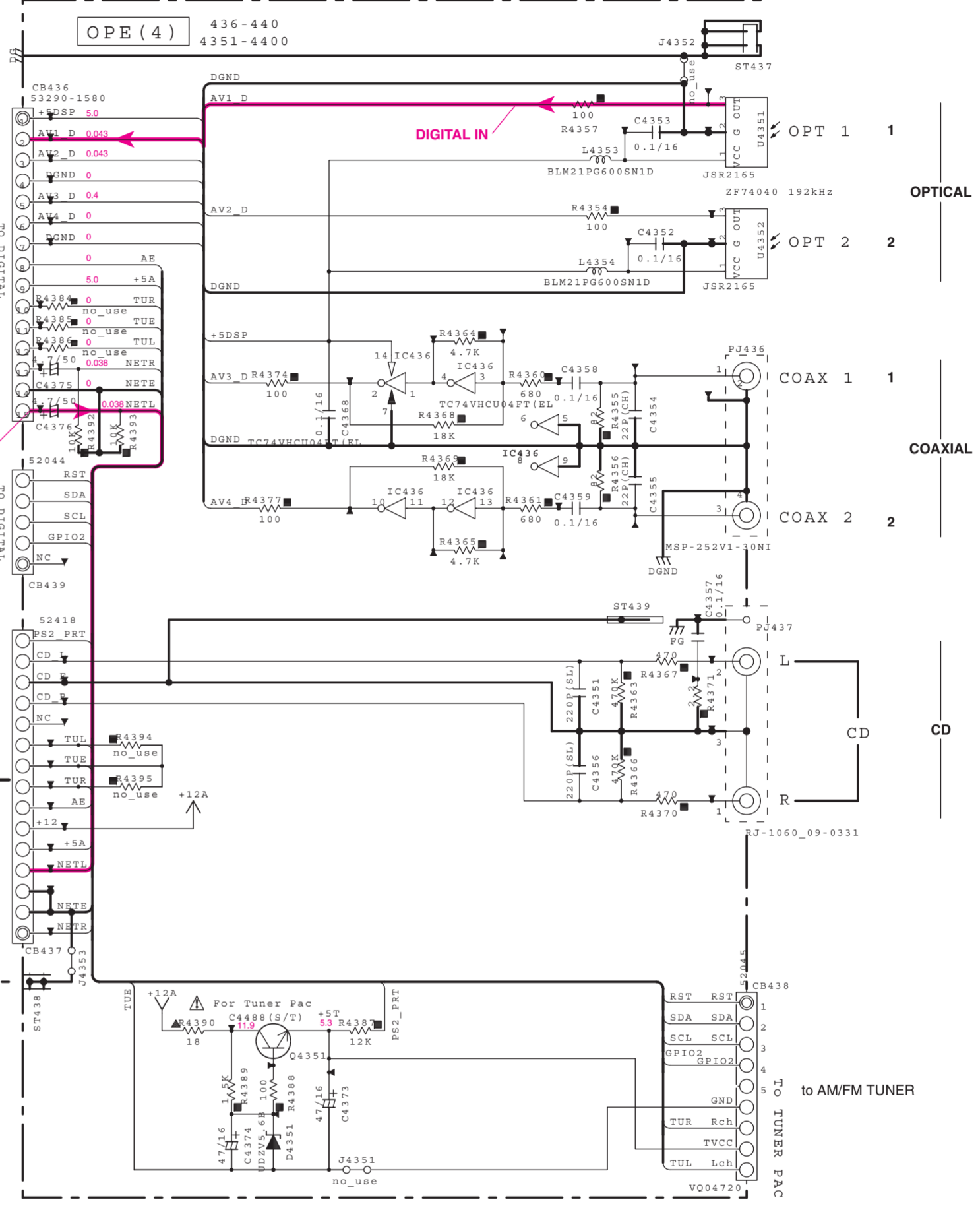


Page 78 [B6] to MAIN (1)\_W2002

IC431: BD3473KS2  
7.1-channel sound processor with built-in mode and input selectors



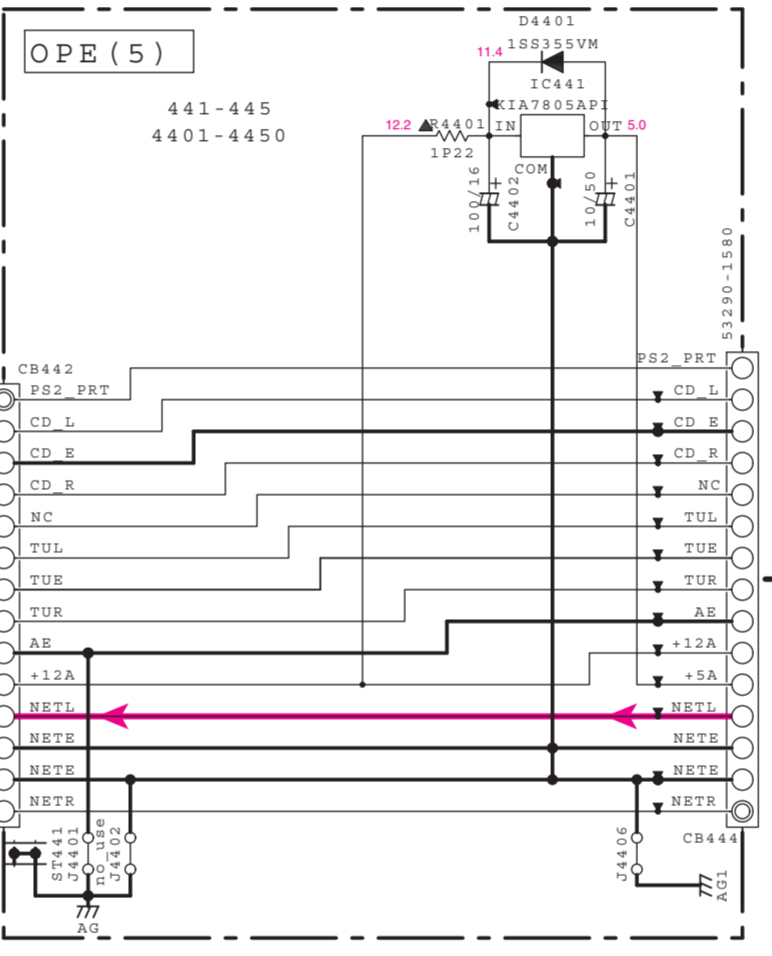
OPERATION (4)



Page 73 [K3] to DIGITAL\_CB2

Page 71 [J1] to DIGITAL\_CB30

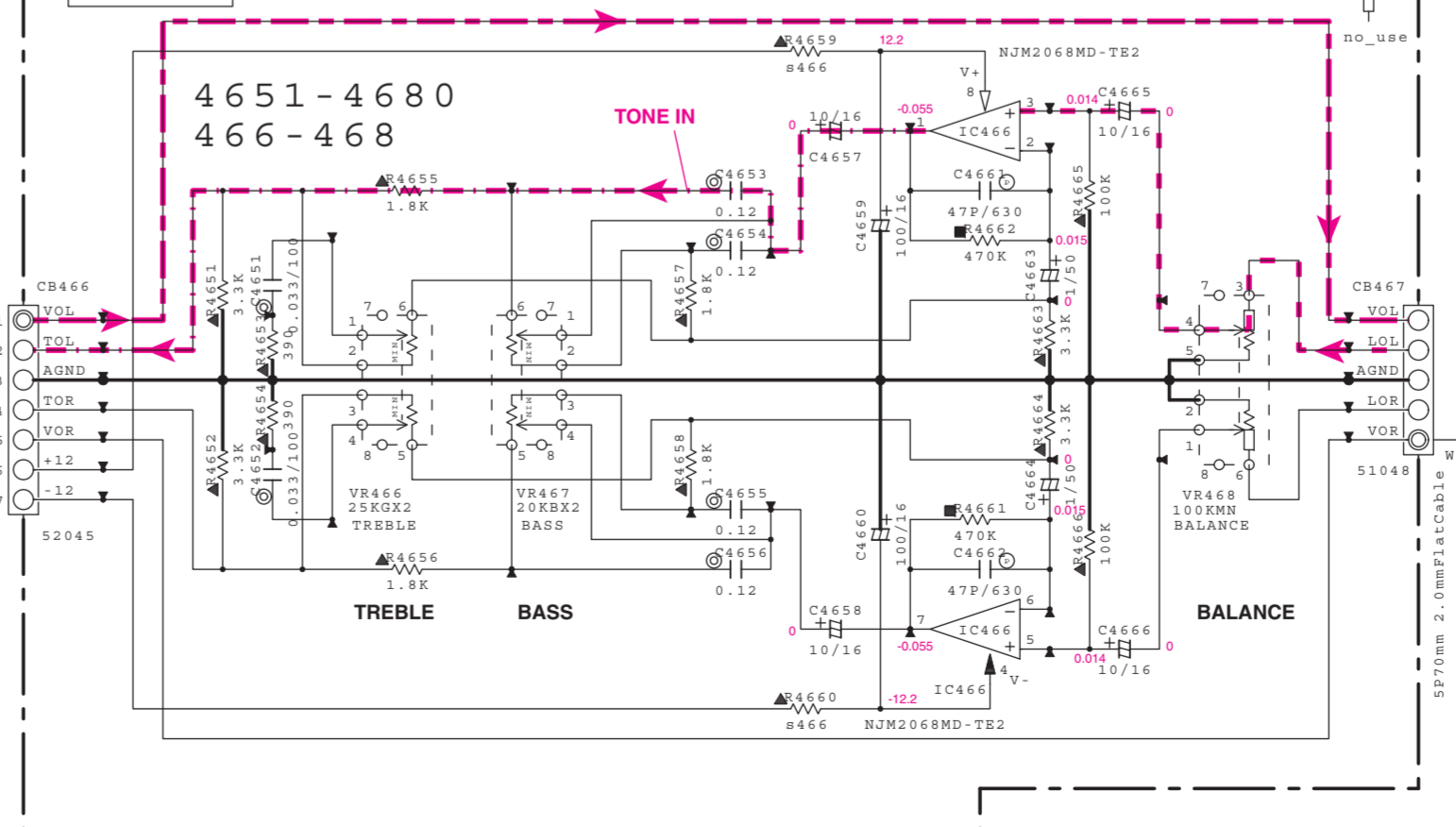
OPERATION (5)



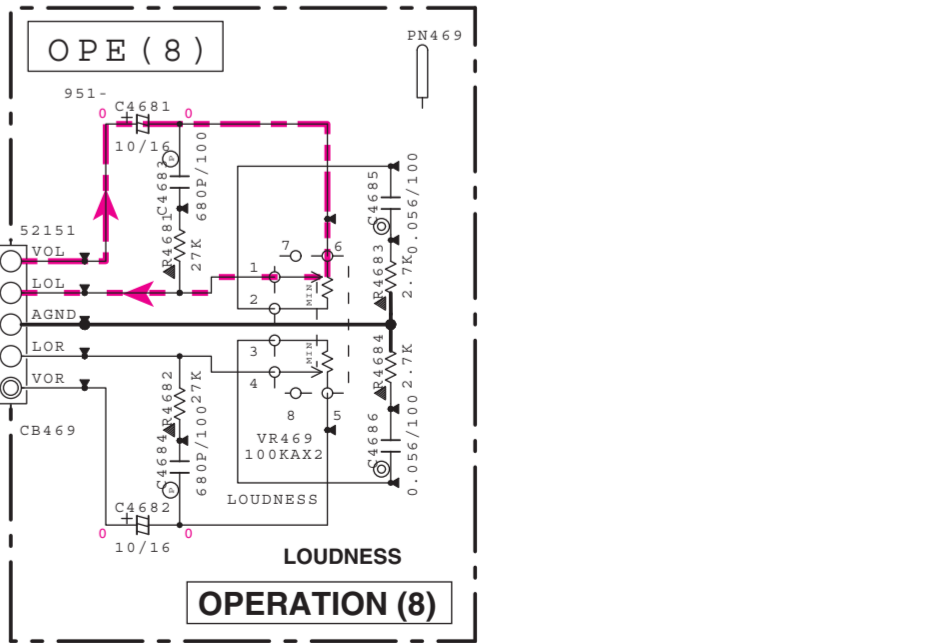
Page 78 [B3] to MAIN (1)\_CB209

Page 78 [B4] to MAIN (1)\_CB201

OPERATION (7)

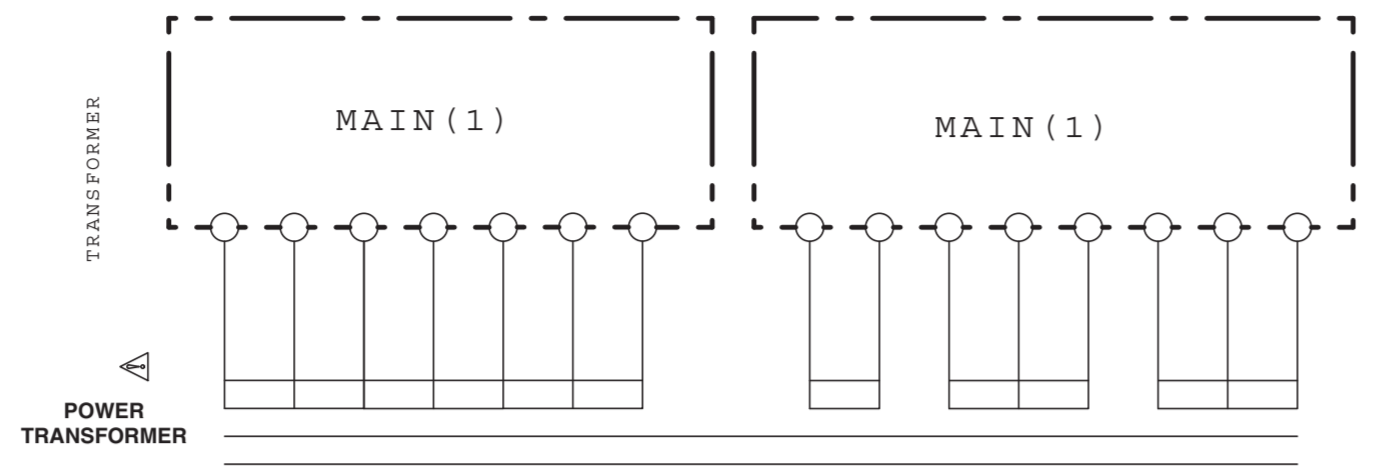


TC2 4681-4700  
469-470



\* All voltages are measured with a 10MΩ/V DC electronic voltmeter.  
 \* Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.  
 \* Schematic diagram is subject to change without notice.

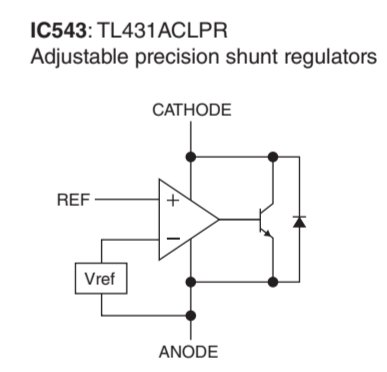
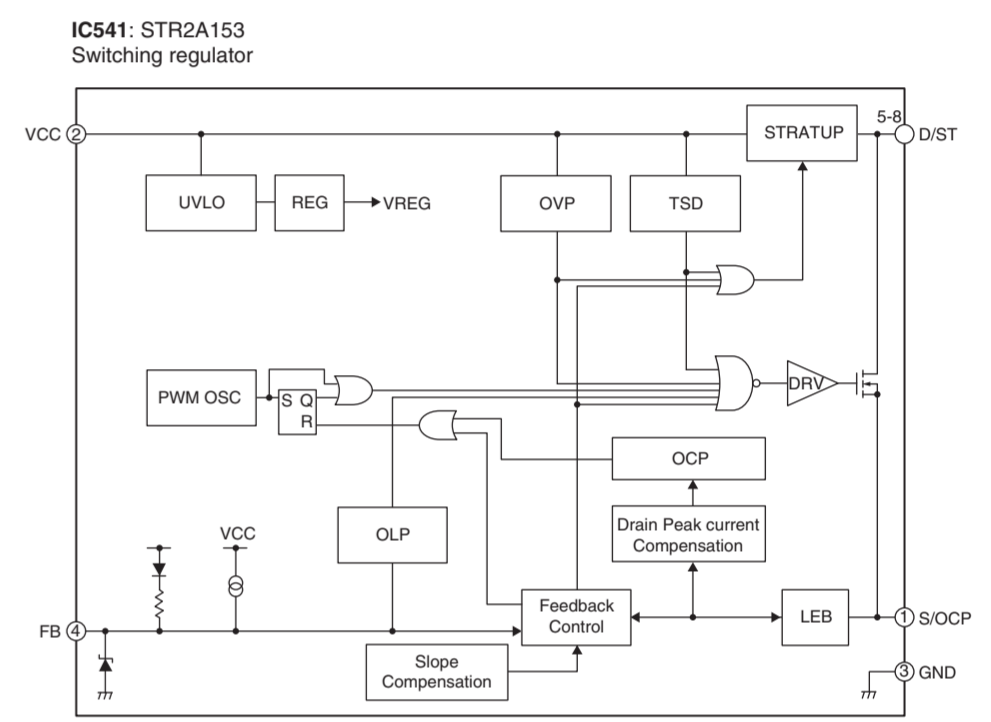
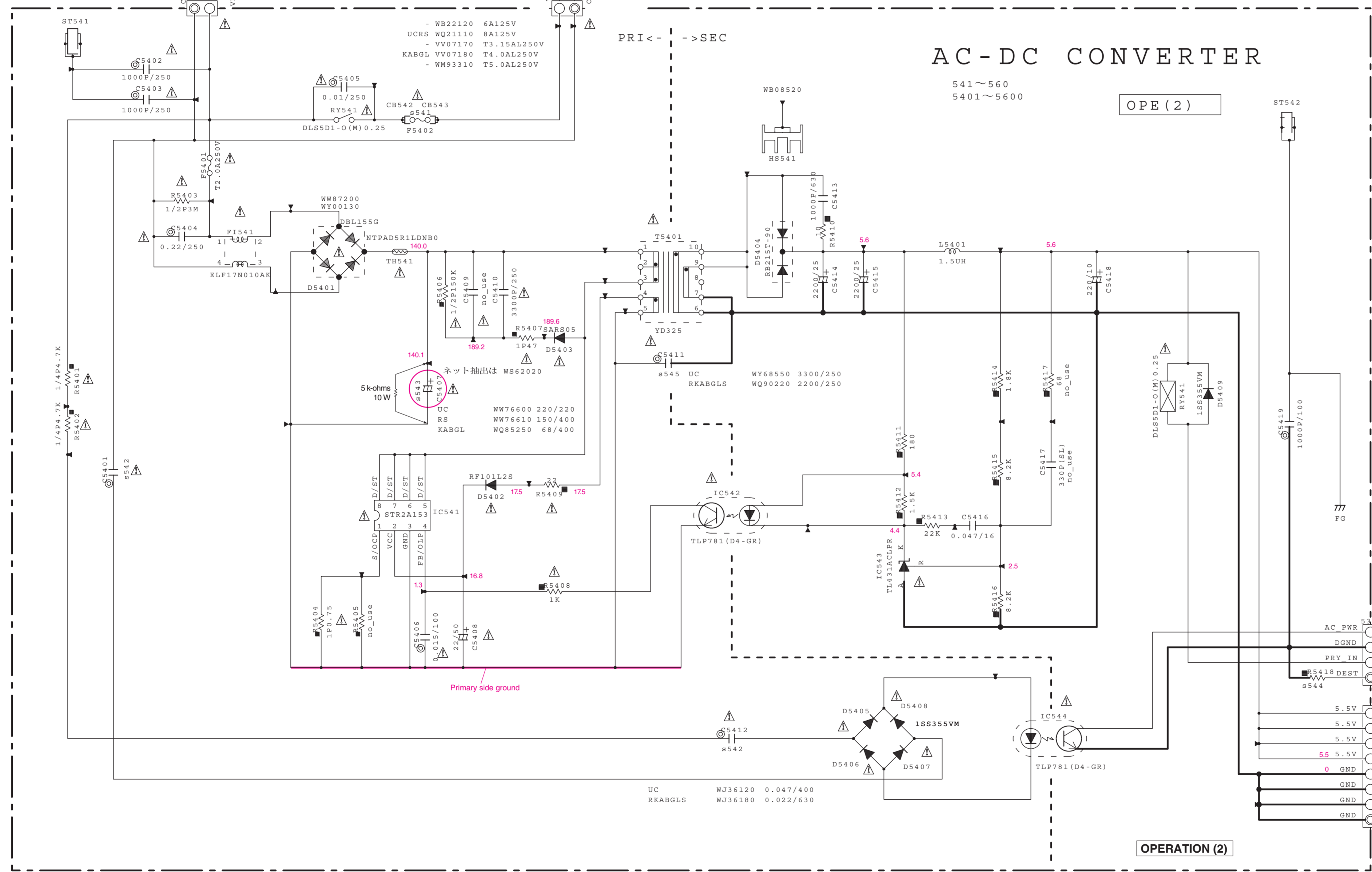
OPERATION 3/3



Notes

Safety measures

- Some internal parts in this product contain high voltages and are dangerous. Be sure to take safety measures during servicing, such as wearing insulating gloves.
- Note that the capacitors indicated below are dangerous even after the power is turned off because an electric charge remains and a high voltage continues to exist there. Before starting any repair work, connect a discharging resistor (5 k-ohms/10 W) to the terminals of each capacitor indicated below to discharge electricity. The time required for discharging is about 30 seconds per each. C5407 on OPERATION (2) P.C.B.



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Page 78 L8 to MAIN (3)\_CB279

★ All voltages are measured with a 10MQ/V DC electronic voltmeter.  
 ★ Components having special characteristics are marked Δ, and must be replaced with parts having specifications equal to those originally installed.  
 ★ Schematic diagram is subject to change without notice.



## ■ REPLACEMENT PARTS LIST

### • ELECTRICAL COMPONENT PARTS

#### WARNING

- Components having special characteristics are marked  $\Delta$  and must be replaced with parts having specifications equal to those originally installed.

#### ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS:

C.A.EL.CHP	: CHIP ALUMI.ELECTROLYTIC CAP	LED.CHP	: CHIP LED
C.CE	: CERAMIC CAP	LED.DSPLY	: LED DISPLAY
C.CE.ARRAY	: CERAMIC CAP ARRAY	LED.INFRD	: LED,INFRARED
C.CE.CHP	: CHIP CERAMIC CAP	PHOT.CPL	: PHOTO COUPLER
C.CE.M.CHP	: CHIP MULTILAYER CERAMIC CAP	PHOT.INTR	: PHOTO INTERRUPTER
C.CE.SAFTY	: RECOGNIZED CERAMIC CAP	PHOT.RFLCT	: PHOTO REFLECTOR
C.CE.TUBLR	: CERAMIC TUBULAR CAP	PHOT.TR	: PHOTO TRANSISTOR
C.CE.SMI	: SEMI CONDUCTIVE CERAMIC CAP	PIN.TEST	: PIN,TEST POINT
C.EL	: ELECTROLYTIC CAP	PTC.THERM	: POSITIVE TEMPERATURE COEFFICIENT THERMISTOR
C.EL.BP	: BIPOLAR ELECTROLYTIC CAP	R.ANTI.SURGE	: FIXED ANTI SURGE RESISTOR
C.EL.CHP	: CHIP ELECTROLYTIC CAP	R.ARRAY	: RESISTOR ARRAY
C.MICA	: MICA CAP	R.CAR.	: CARBON RESISTOR
C.ML.FLM	: MULTILAYER FILM CAP	R.CAR.CHP	: CHIP RESISTOR
C.MP	: METALLIZED POLYESTER FILM CAP	R.CAR.FP	: FLAME PROOF CARBON RESISTOR
C.MYLAR	: MYLAR FILM CAP	R.CEMENT	: CEMENT RESISTOR
C.MYLAR.ML	: MULTILAYER MYLAR FILM CAP	R.CHP	: CHIP RESISTOR
C.NIOB.OXD	: NIOBIUM OXIDE CAP	R.FUS	: FUSIBLE RESISTOR
C.PAPER	: PAPER CAPACITOR	R.MTL.CHP	: CHIP METAL FILM RESISTOR
C.PLS	: POLYSTYRENE FILM CAP	R.MTL.FLM	: METAL FILM RESISTOR
C.POL	: POLYESTER FILM CAP	R.MTL.OXD	: METAL OXIDE FILM RESISTOR
C.PP	: POLYPROPYLENE FILM CAP	R.MTL.PLAT	: METAL PLATE RESISTOR
C.PP.CHP	: CHIP POLYPROPYLENE FILM CAP	RSNR.CE	: CERAMIC RESONATOR
C.TNTL	: TANTALIUM CAP	RSNR.CRYS	: CRYSTAL RESONATOR
C.TNTL.CHP	: CHIP TANTALIUM CAP	SCR.BND.HD	: BIND HEAD B-TIGHT SCREW
C.TRIM	: TRIMMER CAP	SCR.TERM	: SCREW TERMINAL
CN	: CONNECTOR	SCR.TR	: SCREW,TRANSISTOR
CN.BS.PIN	: CONNECTOR,BASE PIN	SURG.PRTCT	: SURGE PROTECTOR
CN.CANNON	: CONNECTOR,CANNON	SUPRT.PCB	: P.C.B. SUPPORT
CN.DIN	: CONNECTOR,DIN	SW.LEVER	: LEVER SWITCH
CN.FLAT	: CONNECTOR,FLAT CABLE	SW.MICRO	: MICRO SWITCH
CN.FFC	: CONNECTOR,FLEXIBLE FLAT CABLE	SW.LEAF	: LEAF SWITCH
CN.HDMI	: HDMI CONNECTOR	SW.PUSH	: PUSH SWITCH
CN.PHOTO.R	: PHOTO FIBER SENSOR,RECEIVED	SW.RT	: ROTARY SWITCH
CN.PHOTO.T	: PHOTO FIBER SENSOR,TRANSMITTED	SW.RT.ENC	: ROTARY ENCODER
D.SCHOTTKY	: SCHOTTKY BARRIER DIODE	SW.RT.MTR	: ROTARY SWITCH WITH MOTOR
DIODE.ARRAY	: DIODE ARRAY	SW.SLIDE	: SLIDE SWITCH
DIODE.BRG	: DIODE BRIDGE	SW.TACT	: TACT SWITCH
DIODE.CHP	: CHIP DIODE	TERM.SP	: SPEAKER TERMINAL
DIODE.VAR	: VARACTOR DIODE	TERM.WRAP	: WRAPPING TERMINAL
DIODE.ZENR	: ZENER DIODE	THRMST.CHP	: CHIP THERMISTOR
DIODE.Z.CHP	: CHIP ZENER DIODE	TR	: TRANSISTOR
DIODE.PHOT	: PHOTO DIODE	TR.CHP	: CHIP TRANSISTOR
FER.BEAD	: FERRITE BEADS	TR.DGT	: DIGITAL TRANSISTOR
FER.CORE	: FERRITE CORE	TR.DGT.CHP	: CHIP DIGITAL TRANSISTOR
FET.CHP	: CHIP FET	TR.PAIR	: PAIR TRANSISTOR
FL.DSPLY	: FLUORESCENT DISPLAY	TRANS	: TRANSFORMER
FLTR.CE	: CERAMIC FILTER	TRANS.PULS	: PULSE TRANSFORMER
FLTR.COMB	: COMB FILTER MODULE	TRANS.PWR	: POWER TRANSFORMER
FLTR.LC.RF	: LC FILTER,EMI	VARISTOR.C	: CHIP VARISTOR
FUSE.CHP	: CHIP FUSE	VOLT.SELCT	: VOLTAGE SELECTOR
GND.MTL	: GROUND PLATE	VR	: ROTARY POTENTIOMETER
GND.TERM	: GROUND TERMINAL	VR.MTR	: POTENTIOMETER WITH MOTOR
JUMPER.CN	: JUMPER CONNECTOR	VR.SLIDE	: SLIDE POTENTIOMETER
JUMPER.TST	: JUMPER,TEST POINT	VR.SW	: POTENTIOMETER WITH SWITCH
L.DTCT	: LIGHT DETECTING MODULE	VR.TRIM	: TRIMMER POTENTIOMETER

## DIGITAL

Ref No.	Part No.	Description	Markets
*	ZH227000	P. C. B.	DIGITAL
CB21	VQ044900	CN. BS. PIN	19P
CB23	VQ045100	CN. BS. PIN	21P
CB24	VK026500	CN. BS. PIN	6P
CB25	VK026800	CN. BS. PIN	9P
CB27	VQ047200	CN. BS. PIN	9P
CB28	WC196000	CN	10P TE FMN
CB29	VB389900	CN. BS. PIN	3P
CB30	VU270500	CN	5P
CB61	LB919040	CN. BS. PIN	4P
CB62	VQ961800	CN. BS. PIN	15P
CB64	LB919050	CN. BS. PIN	5P
CB65	VB858300	CN. BS. PIN	4P
CB951	ZF286600	CN. LAN	8P HR903125C
CB952	VB858400	CN. BS. PIN	5P
CB953	WC195700	CN	7P TE
* C210-211	US661470	C. CE. CHP	47pF 50V
C214-217	US625100	C. CE. CHP	0. 1uF 10V
C218	US634100	C. CE. CHP	0. 01uF 16V
C219	US625100	C. CE. CHP	0. 1uF 10V
C220	US634100	C. CE. CHP	0. 01uF 16V
C221	US663100	C. CE. CHP	1000pF 50V
* C223	US661470	C. CE. CHP	47pF 50V
C224-233	US634100	C. CE. CHP	0. 01uF 16V
C234	US663100	C. CE. CHP	1000pF 50V
C245	US126100	C. CE. CHP	1uF 10V
C246-248	US625100	C. CE. CHP	0. 1uF 10V
C255	US634100	C. CE. CHP	0. 01uF 16V
C256	US662100	C. CE. CHP	100pF 50V
C258-260	US046100	C. CE. CHP	1uF 25V
C261	US662100	C. CE. CHP	100pF 50V
C264	US662100	C. CE. CHP	100pF 50V
C265	US663100	C. CE. CHP	1000pF 50V
C266	US046100	C. CE. CHP	1uF 25V
C267	WG251600	C. CE. CHP	4. 7uF 6. 3V
C268	US046100	C. CE. CHP	1uF 25V
C269	WG251600	C. CE. CHP	4. 7uF 6. 3V
C301-302	UF027330	C. EL. CHP	33uF 10V
C450	US046100	C. CE. CHP	1uF 25V
C452	US046100	C. CE. CHP	1uF 25V
C453	US634100	C. CE. CHP	0. 01uF 16V
C601	US625100	C. CE. CHP	0. 1uF 10V
C602-603	US634100	C. CE. CHP	0. 01uF 16V
C605	US625100	C. CE. CHP	0. 1uF 10V
C606	US662100	C. CE. CHP	100pF 50V
C607	WG888300	C. CE. M. CHP	10uF 6. 3V
C608	US126100	C. CE. CHP	1uF 10V
C609	US046100	C. CE. CHP	1uF 25V
C610	WG888300	C. CE. M. CHP	10uF 6. 3V
C611	US634100	C. CE. CHP	0. 01uF 16V
C613	US661120	C. CE. CHP	12pF 50V
C614	US661150	C. CE. CHP	15pF 50V
C615	WG251600	C. CE. CHP	4. 7uF 6. 3V
C616	WG888300	C. CE. M. CHP	10uF 6. 3V
C617	US126100	C. CE. CHP	1uF 10V
C618	US634100	C. CE. CHP	0. 01uF 16V
C619	US126100	C. CE. CHP	1uF 10V

\* New Parts

Ref No.	Part No.	Description	Markets
C620	US634100	C. CE. CHP	0. 01uF 16V
C621	UB214680	C. CE. CHP	0. 068uF 25V
C622	US643470	C. CE. CHP	4700pF 25V
C623	US625100	C. CE. CHP	0. 1uF 10V
C624	WD758300	C. CE. CHP	10uF 10V
C625	US625100	C. CE. CHP	0. 1uF 10V
C626	US663100	C. CE. CHP	1000pF 50V
C627	US625100	C. CE. CHP	0. 1uF 10V
C628	WD758300	C. CE. CHP	10uF 10V
C629	US634100	C. CE. CHP	0. 01uF 16V
C630	US663100	C. CE. CHP	1000pF 50V
C631	WJ344400	C. CE. CHP	22uF 6. 3V
C635	US625100	C. CE. CHP	0. 1uF 10V
C637	US625100	C. CE. CHP	0. 1uF 10V
C638	US663390	C. CE. CHP	3900pF 50V
C639	US663100	C. CE. CHP	1000pF 50V
C640	WV169100	C. CE. CHP	2. 2uF 10V
C641	US663330	C. CE. CHP	3300pF 50V
C642	US625100	C. CE. CHP	0. 1uF 10V
C643	US663100	C. CE. CHP	1000pF 50V
C644-645	US625100	C. CE. CHP	0. 1uF 10V
C646	WV169100	C. CE. CHP	2. 2uF 10V
C647	US663220	C. CE. CHP	2200pF 50V
C649	US663220	C. CE. CHP	2200pF 50V
C650	WD758300	C. CE. CHP	10uF 10V
C653	US625100	C. CE. CHP	0. 1uF 10V
C654	WJ344400	C. CE. CHP	22uF 6. 3V
C656	US663390	C. CE. CHP	3900pF 50V
C657	US663100	C. CE. CHP	1000pF 50V
C658	US643680	C. CE. CHP	6800pF 25V
C659	US663100	C. CE. CHP	1000pF 50V
C660-661	US625100	C. CE. CHP	0. 1uF 10V
C670	WD758300	C. CE. CHP	10uF 10V
C672	US634100	C. CE. CHP	0. 01uF 16V
C673-674	US663100	C. CE. CHP	1000pF 50V
C676	US625100	C. CE. CHP	0. 1uF 10V
C679	WD758300	C. CE. CHP	10uF 10V
C680	WG888300	C. CE. M. CHP	10uF 6. 3V
C682	WD758300	C. CE. CHP	10uF 10V
C684	WD758300	C. CE. CHP	10uF 10V
C687	US663100	C. CE. CHP	1000pF 50V
C688	US625100	C. CE. CHP	0. 1uF 10V
C701	UF438100	C. EL. CHP	100uF 16V
C705	UF438100	C. EL. CHP	100uF 16V
C706	UF437100	C. EL. CHP	10uF 16V
C9501-9502	UF018100	C. EL. CHP	100uF 6. 3V
C9503-9509	WG888300	C. CE. M. CHP	10uF 6. 3V
C9510-9528	US625100	C. CE. CHP	0. 1uF 10V
C9530-9533	US663100	C. CE. CHP	1000pF 50V
C9535-9543	US663100	C. CE. CHP	1000pF 50V
C9545	US663100	C. CE. CHP	1000pF 50V
C9548-9557	US634100	C. CE. CHP	0. 01uF 16V
C9558	WJ932500	C. CE. CHP	1uF 6. 3V
C9559	US625100	C. CE. CHP	0. 1uF 10V
C9560	WJ932500	C. CE. CHP	1uF 6. 3V
C9562	US044220	C. CE. CHP	0. 022uF 25V B
C9563-9568	WG251600	C. CE. CHP	4. 7uF 6. 3V

\* New Parts



## DIGITAL and OPERATION

Ref No.	Part No.	Description	Markets	Ref No.	Part No.	Description	Markets
C9570-9571	WJ932500	C. CE. CHP	1uF 6.3V		CB439	VQ044100	CN. BS. PIN 5P
C9572-9573	US661150	C. CE. CHP	15pF 50V		CB442	VQ961700	CN. BS. PIN 14P
C9575	US634100	C. CE. CHP	0.01uF 16V		CB444	VQ963600	CN. BS. PIN 15P
C9577	US634100	C. CE. CHP	0.01uF 16V		CB461	VB858400	CN. BS. PIN 5P
C9588-9589	US634100	C. CE. CHP	0.01uF 16V		CB462	VQ044300	CN. BS. PIN 7P
C9590-9591	US625100	C. CE. CHP	0.1uF 10V		CB463	VB858500	CN. BS. PIN 6P
D205	WW783900	DIODE	1SS355VM		CB466	VQ047100	CN. BS. PIN 7P
IC22	YE182A00	IC. MEMORY	R1EX25032ATA00A		CB469	VK026400	CN. BS. PIN 5P
IC24-25	YC288A00	IC	RP130Q331D-TR-F	△	CB541	VG879900	CN. BS. PIN 2P
IC26	X8388A00	IC	TC7WH126FK		CB542-543	WN103000	CLIP. FUSE TP00351-31
IC44	YC289A00	IC	RP130Q501D-TR	△	CB544	VG879900	CN. BS. PIN 2P
IC61	YD216A00	IC	PCM9211PTR		CB545	VQ962900	CN. BS. PIN 8P
IC63	YD570A00	IC	PCM5101PWR		CB546	VQ962500	CN. BS. PIN 4P
IC64	YC288A00	IC	RP130Q331D-TR-F		C4001	US065100	C. CE. CHP 0.1uF 50V B
IC65	X9292A00	IC	R1172H121D-T1-F		C4004-4007	US064100	C. CE. CHP 0.01uF 50V B
IC66	YE478A00	IC	BD7542F-E2 OPAMP		C4008-4009	US135100	C. CE. CHP 0.1uF 16V
IC69	YC288A00	IC	RP130Q331D-TR-F		C4010	UM388100	C. EL 100uF 6.3V
IC70	YA255A00	IC	R1172H501D-T1-F		C4011	WG251600	C. CE. CHP 4.7uF 6.3V
IC71	X8201A00	IC	TC7WH125FK		C4012	US135100	C. CE. CHP 0.1uF 16V
IC952	YF282A00	IC. MEMORY	A3V56S30FTP-G6		C4014	UR268220	C. EL 220uF 50V
* IC953	YF742B00	IC. MEMORY	X29GL256FLT21-90Q	(written)	C4015	UM388330	C. EL 330uF 6.3V
IC954	YF282A00	IC. MEMORY	A3V56S30FTP-G6		C4016	US135100	C. CE. CHP 0.1uF 16V
Q201-203	WY001400	TR. ARRAY	HN4B01JE		C4017	US061680	C. CE. CHP 68pF 50V B
Q204	WZ461800	TR. CHP	2SC4081UBTLR		C4018	US065100	C. CE. CHP 0.1uF 50V B
Q205-210	WZ461700	TR. CHP	2SA1576UBTLR		C4019	US062220	C. CE. CHP 220pF 50V B
Q401	WZ703400	FET	RAL035P01		C4020	US064100	C. CE. CHP 0.01uF 50V B
Q402	WW782000	TR. DGT	DTA044EUBTL		C4021	US065100	C. CE. CHP 0.1uF 50V B
Q601	WW782100	TR. DGT	DTC014EUBTL		C4022	US062100	C. CE. CHP 100pF 50V B
Q602	WW782000	TR. DGT	DTA044EUBTL		C4024	US062100	C. CE. CHP 100pF 50V B
Q604	WW782000	TR. DGT	DTA044EUBTL		C4025	UM388100	C. EL 100uF 6.3V
Q605-607	WZ703400	FET	RAL035P01		C4026-4029	US135100	C. CE. CHP 0.1uF 16V
R615	WZ713400	R. CHP	0.027Ω 1/3W		C4030	US064100	C. CE. CHP 0.01uF 50V B
R9501-9504	WZ748900	R. CHP	49.9Ω 1/16W		C4031	US135100	C. CE. CHP 0.1uF 16V
R9505	WZ749000	R. CHP	12.4KΩ 1/16W		C4032-4033	US063100	C. CE. CHP 1000pF 50V B
XL21	WA782500	RSNR. CE	8MHz		C4034-4035	US061470	C. CE. CHP 47pF 50V B
XL61	WS190000	RSNR. CRYST	24.576MHZ DSX321G		C4211-4212	US063100	C. CE. CHP 1000pF 50V B
XL951	WJ081300	RSNR. CRYST	24MHZ DSX321G		C4261-4262	WJ609500	C. MYLAR 3300pF 100V
					C4263	US064100	C. CE. CHP 0.01uF 50V B
					C4264	US063100	C. CE. CHP 1000pF 50V B
					* C4271	UR229100	C. EL 1000uF 10V
					C4272	US063100	C. CE. CHP 1000pF 50V B
					C4273	WD758300	C. CE. CHP 10uF 10V
					C4301-4304	US061470	C. CE. CHP 47pF 50V B
					C4305-4310	US062220	C. CE. CHP 220pF 50V B
					C4313-4316	UR837100	C. EL 10uF 16V
					C4317-4318	US035100	C. CE. CHP 0.1uF 16V B
					C4319-4320	UR267470	C. EL 47uF 50V
					C4321-4322	UR267100	C. EL 10uF 50V
					C4323	US063100	C. CE. CHP 1000pF 50V B
					C4324-4325	US061100	C. CE. CHP 10pF 50V B
					C4326	US135100	C. CE. CHP 0.1uF 16V
					C4327-4328	WJ608300	C. MYLAR 220pF 100V
					C4329-4330	UR218220	C. EL 220uF 6.3V
					C4331-4332	WJ610800	C. MYLAR 0.033uF 100V
					C4333-4334	WJ610100	C. MYLAR 9100pF 100V
					C4335-4336	UR238100	C. EL 100uF 16V
					C4337-4338	UR237100	C. EL 10uF 16V
CB402	VQ044900	CN. BS. PIN	19P				
CB422	VB858300	CN. BS. PIN	4P				
CB426	VB858400	CN. BS. PIN	5P				
CB427	WQ680200	CN. USB	4P TE AAPVA004C0				
CB432	VQ963500	CN. BS. PIN	14P				
CB433	VQ047000	CN. BS. PIN	6P				
CB434	VB390000	CN. BS. PIN	4P				
CB436	VQ963600	CN. BS. PIN	15P				
CB437	VQ961800	CN. BS. PIN	15P				
CB438	VQ047200	CN. BS. PIN	9P				

\* New Parts

\* New Parts

## OPERATION

Ref No.	Part No.	Description	Markets	Ref No.	Part No.	Description	Markets
C4339-4340	WJ609300	C. MYLAR 2200pF 100V		D4401	WW783900	DIODE 1SS355VM	
C4341-4342	US062220	C. CE. CHP 220pF 50V B	KABGL	△ D5401	WW872000	DIODE. BRG DBL155G 1.5A 600	
C4351	US062220	C. CE. CHP 220pF 50V B		△ D5402	WE665600	DIODE RF101L2STE25	
C4352-4353	US035100	C. CE. CHP 0.1uF 16V B		△ D5403	WW170700	DIODE SARS05	
C4354-4355	US061220	C. CE. CHP 22pF 50V B		D5404	WW745500	D. SCHOTTKY RB215T-90 20A 90V	
C4356	US062220	C. CE. CHP 220pF 50V B		△ D5405-5409	WW783900	DIODE 1SS355VM	
C4357	US135100	C. CE. CHP 0.1uF 16V		△ F5401	WR944000	FUSE 2A 250V	
C4358-4359	US035100	C. CE. CHP 0.1uF 16V B		△ F5402	WQ211100	FUSE 8A 125V	UCRS
C4368	US035100	C. CE. CHP 0.1uF 16V B		△ F5402	VV071800	FUSE 4A 250V	KABGL
C4373-4374	UR237470	C. EL 47uF 16V		IC401	X6386A00	IC M66003-0131FP	
C4375-4376	UR266470	C. EL 4.7uF 50V		IC402	X6406A00	IC TC74HC14AF (EL, F)	
C4401	UR267100	C. EL 10uF 50V		IC431	YD953A00	IC BD3473KS2	
C4402	UU238100	C. EL 100uF 16V		IC432	X3505A00	IC NJM2068MD-TE2	
C4601-4602	UR237100	C. EL 10uF 16V		IC436	XZ509A00	IC TC74VHC04FT INVER	
C4603-4604	UR238100	C. EL 100uF 16V		IC441	X4928A00	IC KIA7805AP1 5V	
C4605-4606	UR237100	C. EL 10uF 16V		IC461	X3505A00	IC NJM2068MD-TE2	
C4607	US064100	C. CE. CHP 0.01uF 50V B	KBGL	IC466	X3505A00	IC NJM2068MD-TE2	
C4651-4652	WJ610800	C. MYLAR 0.033uF 100V		△ IC541	YD188A00	IC STR2A153	
C4653-4656	VR168400	C. MYLAR 0.12uF 50V		△ IC542	WP388200	PHOT. CPL TLP781 (D4-GR, F)	
C4657-4658	UR237100	C. EL 10uF 16V		△ IC543	YA276A00	IC TL431AC 2.5-36V	
C4659-4660	UR238100	C. EL 100uF 16V		△ IC544	WP388200	PHOT. CPL TLP781 (D4-GR, F)	
C4661-4662	WE100400	C. PP 47pF 630V K		JK426	WZ975700	JACK. PHONE MSJ-064-05B-B-RF	
C4663-4664	UR266100	C. EL 1uF 50V		PJ431-432	V7046800	JACK. PIN 6P MSP-246V1-01NI	
C4665-4666	UR237100	C. EL 10uF 16V		PJ436	V9420700	JACK. PIN 2P MSP-252V1-30NI	
C4681-4682	UR237100	C. EL 10uF 16V		PJ437	WD195100	JACK. PIN 2P	
C4683-4684	WE101500	C. PP 680pF 100V J		Q4001-4004	WC529400	TR KTC3875S Y GR RTK	
C4685-4686	WJ611100	C. MYLAR 0.056uF 100V		Q4005-4006	VV556400	TR 2SC2412K Q, R, S	
△ C5401	WJ361200	C. POL. MTL 0.047uF 400V	UC	Q4007	WW782100	TR. DGT DTC014EUBTL	
△ C5401	WJ361800	C. POL. MTL 0.022uF 630V	RKABGLS	Q4301	VP872700	TR 2SC4488 S, T	
△ C5402-5403	WQ902300	C. CE. SAFTY 1000pF 250V		Q4302	VP872600	TR 2SA1708 S, T	
△ C5404	V5877700	C. MYLAR 0.22uF 250V		Q4351	VP872700	TR 2SC4488 S, T	
△ C5405	WQ939400	C. CE. SAFTY 0.01uF 250V		Q4601-4602	WC883400	TR 2SD2704 K	
△ C5406	WJ610400	C. MYLAR 0.015uF 100V		R4263-4264	V8071300	R. MTL. FLM 470 Ω 1W	
△ C5407	WW766000	C. EL 220uF 220V	UC	R4331-4332	V8070500	R. MTL. FLM 22 Ω 1W	
C5407	WW766100	C. EL 150uF 400V	RS	R4349-4350	V8071300	R. MTL. FLM 470 Ω 1W	
C5407	WQ852500	C. EL 68uF 400V	KABGL	R4351-4352	WW971300	R. MTL. OXD 680 Ω 1/4W	
△ C5408	UR267220	C. EL 22uF 50V		R4359	WW970900	R. MTL. OXD 470 Ω 1/4W	
△ C5410	WR246900	C. CE. CHP 3300pF 250V		R4362	WW970900	R. MTL. OXD 470 Ω 1/4W	
△ C5411	WY685500	C. CE. SAFTY 3300pF 250V	UC	△ R4390	WW967500	R. MTL. OXD 18 Ω 1/4W	
△ C5411	WQ902200	C. CE. SAFTY 2200pF 250V	RKABGLS	R4401	V8070500	R. MTL. FLM 22 Ω 1W	
△ C5412	WJ361200	C. POL. MTL 0.047uF 400V	UC	R4659-4660	V8070000	R. MTL. FLM 1 Ω 1W	
△ C5412	WJ361800	C. POL. MTL 0.022uF 630V	RKABGLS	△ R5401-5402	WR033300	R. CHP 4.7K Ω 1/4W	
C5413	WJ322300	C. CE. M. CHP 1000pF 630V		△ R5403	WU547900	R. ANTI. SURGE 3M Ω 1/2W	
C5414-5415	WH776400	C. EL 2200uF 25V		△ R5404	WY078600	R. CHP 0.75 Ω 1W	
C5416	US034470	C. CE. CHP 0.047uF 16V B		△ R5406	WW745400	R. CHP 150K Ω 1/2W	
C5418	WH771600	C. EL 220uF 10V		△ R5407	VF167800	R. CHP 47 Ω 1W	
C5419	WJ608900	C. MYLAR 1000pF 100V		△ RY541	WQ804100	RELAY DC DLS5D1-0(M) 0.25	
D4001-4008	WW783900	DIODE 1SS355VM		SW401-406	WD483100	SW. TACT SKRGAAD010	
D4009	V2598200	LED SIR-505ST		SW410-416	WD483100	SW. TACT SKRGAAD010	
D4010	WW783900	DIODE 1SS355VM		SW417	ZE287300	SW. RT XRE0126 299-9834	
D4011-4012	WY163000	DIODE. ZENR UDZV4. 3B		SW422	ZF974300	SW. RT. ENC XREB12505PVB25FINA	
D4013	WW783900	DIODE 1SS355VM		SW461	VV399800	SW. PUSH SPUN12	
D4014	WA467800	LED SEL6910A-CD		△ T5401	YD325A00	TRANS. PWR	
D4261-4262	WW783900	DIODE 1SS355VM		△ TH541	WF544600	PTC. THERM NTPAD5R1LDNB0 5.1	
D4301-4302	WY163600	DIODE. ZENR UDZV7. 5B		U4001	WR153900	L. DTCT RPM7238-H9R	
D4303-4304	WW783900	DIODE 1SS355VM		U4351-4352	ZF740400	CN. PHOTO. R 1P JSR2165	
D4351	WY163300	DIODE. ZENR UDZV5. 6B		V4001	ZG266300	FL. DSPLY 18-MT-11GNAK	

\* New Parts

\* New Parts

<b>OPERATION and MAIN</b>
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Ref No.	Part No.	Description	Markets	Ref No.	Part No.	Description	Markets
VR466	WP293500	VR G 25K Ω	(EVJC50FA3GF4)	C2043	UR818100	C. EL 100uF 6.3V	
VR467	WP293400	VR B 20K Ω	(EVJC50FA3B2)	* C2044-2045	ZH488800	C. EL 8200uF 71V	
VR468	WP293600	VR BH 100K Ω	(EVJC50FA3375)	C2046	US163100	C. CE. CHP 1000pF 50V	
VR469	WP293300	VR A 100K Ω	(EVJC20FA3A15)	C2047	VR169100	C. MYLAR 0.39uF 50V	
	WM187700	SHEET		C2049-2050	WJ610600	C. MYLAR 0.022uF 100V	
	ZA889400	SPACER 4. 3x8x30		C2051	VR168300	C. MYLAR 0.1uF 50V	
	WE774200	SCR. BND. HD 3x10 MFZ2W3		C2052	UR268100	C. EL 100uF 50V	
	ZH227400	P. C. B.	MAIN UCA	C2054-2055	US135100	C. CE. CHP 0.1uF 16V	
*	ZH227500	P. C. B.	MAIN RS	C2056-2057	UR237470	C. EL 47uF 16V	
*	ZH227600	P. C. B.	MAIN KBGL	C2058	UR267100	C. EL 10uF 50V	
	CB201	VQ047000	CN. BS. PIN 6P	C2059	UR278100	C. EL 100uF 63V	
	CB203	VQ963400	CN. BS. PIN 13P	C2060	UR237470	C. EL 47uF 16V	
	CB204	VQ963300	CN. BS. PIN 12P	C2061-2066	WN165300	C. PP 0.01uF 100V	RKBGLS
	CB205	VK025300	CN. BS. PIN 9P	C2067	WN165300	C. PP 0.01uF 100V	
	CB206	VL845000	CN. BS. PIN 6P	C2068	WN165500	C. PP 0.022uF 100V	
	CB207	LB932050	CN. BS. PIN 5P	C2070	WJ610200	C. MYLAR 0.01uF 100V	
	CB261	VQ961600	HOUSING 13P	C2071	US163100	C. CE. CHP 1000pF 50V	
	CB262	VQ961500	CN. BS. PIN 12P	C2073-2075	US063100	C. CE. CHP 1000pF 50V B	
	CB263	VQ047600	CN. BS. PIN 21P	C2077	US163100	C. CE. CHP 1000pF 50V	
	CB266	VB858200	CN. BS. PIN 3P	C2078	US065100	C. CE. CHP 0.1uF 50V B	
	CB271	V9377900	CN. BS. PIN 4P	C2079	US064100	C. CE. CHP 0.01uF 50V B	KBGL
	CB272-273	WNO77700	CLIP. FUSE CLIP PFC5000-0202F	C2661	US135100	C. CE. CHP 0.1uF 16V	
	CB274	VB858200	CN. BS. PIN 3P	C2741-2742	US063100	C. CE. CHP 1000pF 50V B	
	CB275	VK026300	CN. BS. PIN 4P	C2761	UR838100	C. EL 100uF 16V	
	CB276	VK026200	CN. BS. PIN 3P	C2762	US063100	C. CE. CHP 1000pF 50V B	
	CB277	WZ022500	CN. USB 4P UAR27 SE	C2781	US064100	C. CE. CHP 0.01uF 50V B	
	CB278	VB389800	CN. BS. PIN 2P	C2782	UM416100	C. EL 1uF 50V	
	CB279	VQ961100	CN. BS. PIN 8P	C2783	UR266220	C. EL 2.2uF 50V	
	CB281	VQ960700	HOUSING 4P	C2784	US064100	C. CE. CHP 0.01uF 50V B	
	C2001-2002	UR266470	C. EL 4.7uF 50V	△ D2001-2002	WY163900	DIODE. ZENR UDZV10B	
	C2003-2006	WE100400	C. PP 47pF 630V K	D2003-2005	WW783900	DIODE 1SS355VM	
	C2007	WP420700	C. PP 100pF 100V	△ D2006-2007	WY163200	DIODE. ZENR UDZV5.1B	
	C2008-2009	UR267100	C. EL 10uF 50V	D2008	WW783900	DIODE 1SS355VM	
	C2010	US064100	C. CE. CHP 0.01uF 50V B	D2009	WY165000	DIODE. ZENR UDZV30B	RS
	C2011	UR238100	C. EL 100uF 16V	D2012-2013	WY164200	DIODE. ZENR UDZV13B	
	C2012-2013	WN164600	C. PP 1000pF 100V	△ D2016	WH487300	DIODE. BRG RS203M 2.0A 200V	
	C2014	UR238100	C. EL 100uF 16V	D2017-2018	WW783900	DIODE 1SS355VM	
	C2015	US064100	C. CE. CHP 0.01uF 50V B	△ D2019	WB212700	DIODE. BRG RS603M 6A 200V	
	C2017-2018	WE100200	C. PP 22pF 630V K	* D2021	ZC567500	DIODE. ZENR UDZV39B	
	C2020	UR278330	C. EL 330uF 63V	△ D2022	WU201600	DIODE 1N4003S TP	
	C2021-2022	WN165300	C. PP 0.01uF 100V	D2023-2024	WW783900	DIODE 1SS355VM	
	C2023-2024	UU267470	C. EL 47uF 50V	D2027	WW783900	DIODE 1SS355VM	
	C2025	UR267470	C. EL 47uF 50V	D2751	WA467800	LED SEL6910A-CD	
	C2026-2027	WE100500	C. PP 100pF 630V K	D2781-2785	WW783900	DIODE 1SS355VM	
	C2028	UR267470	C. EL 47uF 50V	△ F2701	VV071800	FUSE 4A 250V	RS
	C2029-2030	WE100500	C. PP 100pF 630V K	G2001	V5995800	PLATE. GND	
	C2031	UR258100	C. EL 100uF 35V	IC201	X2331A00	IC NJM4580E OP AMP	
	* C2032-2033	UR248330	C. EL 330uF 25V	IC267	YA381A00	IC LM19C1Z/LF THERMAL	
	C2034-2035	UR267100	C. EL 10uF 50V	JK201-202	WE260000	JACK. MINI LGY6501-0900FC	
	C2036-2037	UR249680	C. EL 6800uF 25V	PJ201	V7189700	JACK. PIN 1P	
	C2036-2037	UR049680	C. EL 6800uF 25V	△ # Q201-202	VV586400	TR. PAIR 2SA1695/C4468 OPY	(A:1X630850, C:1X630860)
	C2038	UR866470	C. EL 4.7uF 50V	△ * Q2001-2002	WK452200	TR 2SAZH219103M	
	C2039-2040	WN165500	C. PP 0.022uF 100V	△ Q2003-2004	WC397700	TR 2N5401C-AT	
	C2041-2042	WJ610600	C. MYLAR 0.022uF 100V	△ * Q2005-2006	WK452200	TR 2SAZH219103M	
				△ Q2007	WW782100	TR. DGT DTC014EUBTL	
				△ Q2008	WW782000	TR. DGT DTA044EUBTL	
				△ Q2009-2010	WC292200	TR KTC3206Y-AT	

\* New Parts

\* New Parts

**Note)** Those parts marked with “#” are not included in the P.C.B. assembly.

MAIN

Ref No.	Part No.	Description	Markets
△	Q2011	WW782100 TR. DGT DTC014EUBTL	
△	Q2012	WW782000 TR. DGT DTA044EUBTL	
△	Q2013-2014	ZD495300 TR 2SC4115S S	
△	Q2015	WW782100 TR. DGT DTC014EUBTL	
△	Q2016	WW782000 TR. DGT DTA044EUBTL	
△	Q2017	WW782100 TR. DGT DTC014EUBTL	
△	Q2018	WW782000 TR. DGT DTA044EUBTL	
△	Q2019	VP872700 TR 2SC4488 S, T	
△	Q2020-2021	VP872600 TR 2SA1708 S, T	
	Q2022	VP872700 TR 2SC4488 S, T	
△	Q2023	WF691400 TR 2SD2014	
△	Q2024	WF691300 TR 2SB1257	
	Q2025-2026	ZF457100 TR INC6002AC1-T112-1W	
	Q2027	ZF457000 TR INA6002AC1-TH12-1W	
	Q2028	WB228800 TR KTC3198 Y AT	
△	Q2030	VP872600 TR 2SA1708 S, T	
	Q2031-2032	WC883400 TR 2SD2704 K	
	Q2751	WC529400 TR KTC3875S Y GR RTK	
	Q2781-2782	WZ461800 TR. CHP 2SC4081UBTLR	
	Q2783	WW782300 TR. DGT DTC044EUBTL	
*	R2001-2002	WW976500 R. MTL. OXD 100K Ω 1/4W	
*	R2003-2004	WW971700 R. MTL. OXD 1K Ω 1/4W	
	R2005-2006	WW972100 R. MTL. OXD 1.5K Ω 1/4W	
*	R2007-2008	WW975300 R. MTL. OXD 33K Ω 1/4W	
	R2009-2010	WA622400 R. MTL. OXD 8.2K Ω 1W	
	R2011	WW965300 R. MTL. OXD 2.2 Ω 1/4W	
*	R2012	WW971900 R. MTL. OXD 1.2K Ω 1/4W	
*	R2013-2014	WW970700 R. MTL. OXD 390 Ω 1/4W	
*	R2015	WW971900 R. MTL. OXD 1.2K Ω 1/4W	
*	R2016-2017	WW974900 R. MTL. OXD 22K Ω 1/4W	
	R2018-2019	WW975700 R. MTL. OXD 47K Ω 1/4W	
*	R2020-2021	WW976500 R. MTL. OXD 100K Ω 1/4W	
△	R2022-2023	HL004470 R. MTL. OXD 47 Ω 1/2W	
△	R2024	V8070700 R. MTL. FLM 47 Ω 1W	
	R2025-2028	WW973500 R. MTL. OXD 5.6K Ω 1/4W	
	R2029	HL005390 R. MTL. OXD 390 Ω 1/2W	
	R2030-2031	HL005820 R. MTL. OXD 820 Ω 1/2W	
	R2032	HL005390 R. MTL. OXD 390 Ω 1/2W	
	R2033	WW865300 R. CAR. FP 2.7K Ω 1/4W	
	R2034-2035	HL006100 R. MTL. OXD 1K Ω 1/2W	
	R2036	WW865300 R. CAR. FP 2.7K Ω 1/4W	
	R2037-2038	WW861700 R. CAR. FP 4.7 Ω 1/4W	
△ *	R2039-2040	WW863700 R. CAR. FP 220 Ω 1/4W	
	R2041	WW972500 R. MTL. OXD 2.2K Ω 1/4W	RS
	R2042-2045	WW861700 R. CAR. FP 4.7 Ω 1/4W	
△	R2049-2050	V3873200 R. CEMENT 0.22 Ω 3W	
	R2055-2056	WW969300 R. MTL. OXD 100 Ω 1/4W	
△	R2059-2060	WW972100 R. MTL. OXD 1.5K Ω 1/4W	
△	R2064-2065	V8070300 R. MTL. FLM 10 Ω 1W	
	R2069-2070	WW862100 R. CAR. FP 10 Ω 1/4W	
△	R2080	WW861700 R. CAR. FP 4.7 Ω 1/4W	
△	R2082	WW861700 R. CAR. FP 4.7 Ω 1/4W	
	R2083	WW861300 R. CAR. FP 2.2 Ω 1/4W	
	R2085-2086	WW968100 R. MTL. OXD 33 Ω 1/4W	
	R2100	WW966900 R. MTL. OXD 10 Ω 1/4W	
*	R2101	WW973100 R. MTL. OXD 3.9K Ω 1/4W	
△	R2105	WW965300 R. MTL. OXD 2.2 Ω 1/4W	

\* New Parts

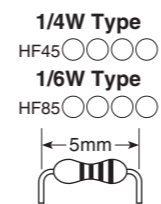
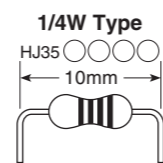
Ref No.	Part No.	Description	Markets
R2112	WW970100	R. MTL. OXD 220 Ω 1/4W	
R2117	WA622000	R. MTL. OXD 1.2K Ω 1W	
R2118-2119	V8072500	R. MTL. OXD 22K Ω 1W	
△	RY201-203	WJ122400 RELAY 981-2A-24DS-SP7	
	RY204	WE648700 RELAY DC DH24D2-0-Q	
	SW271	WV382900 SW. SLIDE SL14	RS
	SW274	WQ270000 SW. PUSH SPUN122100	
	SW275	WU974000 SW. RT. ENC REB161 (9X7)PVB20FI	
	TE201	WU987000 TERM. SP 4P MST-224VD-03	UCARS
	TE201	WU987200 TERM. SP 4P MST-224VD-03	KBGL
	TE202	WU986900 TERM. SP 4P MST-224VD-02	UCARS
	TE202	WU987100 TERM. SP 4P MST-224VD-02	KBGL
	TH201	V9760200 THRMST. CHP NCP18XH103J03RB	
		WE774200 SCR. BND. HD 3x10 MFZN2W3	

\* New Parts

R-N500

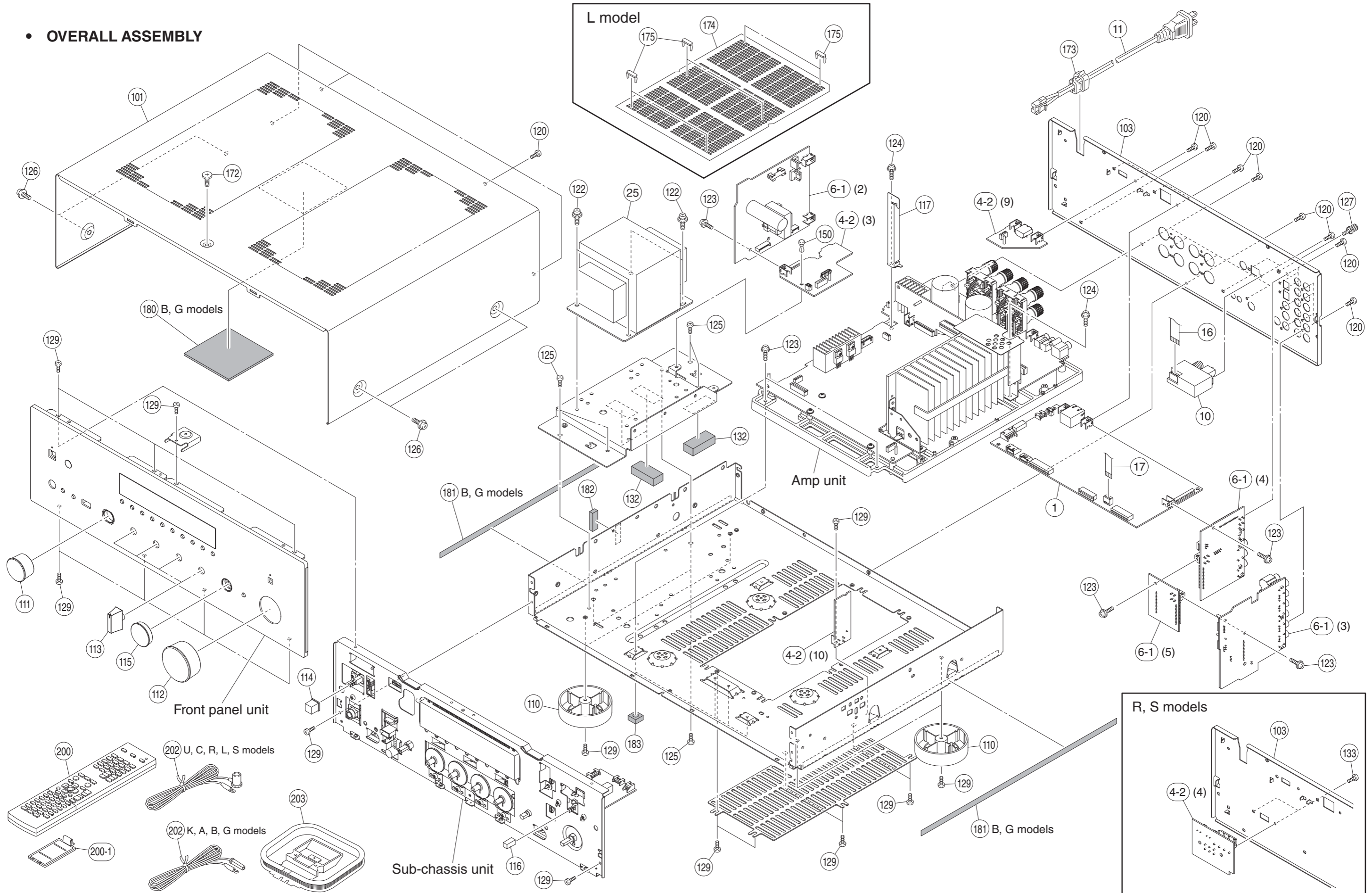
## Carbon Resistors

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ35 3100	HF85 3100	11 kΩ	HF45 7110	HF45 7110
1.8 Ω	HJ35 3180	*	12 kΩ	HJ35 7120	HF85 7120
2.2 Ω	HJ35 3220	HF85 3220	13 kΩ	HF45 7130	HF45 7130
3.3 Ω	HJ35 3330	HF85 3330	15 kΩ	HF45 7150	HF45 7150
4.7 Ω	HJ35 3470	HF85 3470	18 kΩ	HF45 7180	HF45 7180
5.6 Ω	HJ35 3560	HF85 3560	22 kΩ	HF45 7220	HF45 7220
10 Ω	HF45 4100	HF45 4100	24 kΩ	HF45 7240	HF45 7240
15 Ω	HJ35 4150	HF85 4150	27 kΩ	HJ35 7270	HF85 7270
22 Ω	HF45 4220	HF45 4220	30 kΩ	HF45 7300	HF45 7300
27 Ω	HJ35 4270	HF85 4270	33 kΩ	HF45 7330	HF45 7330
33 Ω	HF45 4330	HF45 4330	36 kΩ	HF45 7360	HF45 7360
39 Ω	HJ35 4470	HF85 4390	39 kΩ	HF45 7390	HF45 7390
47 Ω	HF45 4470	HF45 4470	47 kΩ	HF45 7470	HF45 7470
56 Ω	HF45 4560	HF45 4560	51 kΩ	HF45 7510	HF45 7510
68 Ω	HF45 4680	HF45 4680	56 kΩ	HF45 7560	HF45 7560
75 Ω	HF45 4750	HF45 4750	62 kΩ	HF45 7620	HF45 7620
82 Ω	HF45 4820	HF45 4820	68 kΩ	HF45 7680	HF45 7680
91 Ω	HF45 4910	HF45 4910	82 kΩ	HF45 7820	HF45 7820
100 Ω	HF45 5100	HF45 5100	91 kΩ	HF45 7910	HF45 7910
110 Ω	HJ35 5110	HF85 5110	100 kΩ	HF45 8100	HF45 8100
120 Ω	HF45 5120	HF45 5120	110 kΩ	HF45 8110	HF45 8110
150 Ω	HF45 5150	HF45 5150	120 kΩ	HF45 8120	HF45 8120
160 Ω	HJ35 5160	*	130 kΩ	HF45 8130	*
180 Ω	HF45 5180	HF45 5180	150 kΩ	HF45 8150	HF45 8150
200 Ω	HF45 5200	HF45 5200	180 kΩ	HF45 8180	HF45 8180
220 Ω	HF45 5220	HF45 5220	220 kΩ	HJ35 8220	HF85 8220
270 Ω	HF45 5270	HF45 5270	270 kΩ	HF45 8270	HF45 8270
330 Ω	HF45 5330	HF45 5330	300 kΩ	HF45 8300	HF45 8300
390 Ω	HF45 5390	HF45 5390	330 kΩ	HF45 8330	HF45 8330
430 Ω	HF45 5430	HF45 5430	390 kΩ	HJ35 8390	HF85 8390
470 Ω	HF45 5470	HF45 5470	470 kΩ	HF45 8470	HF45 8470
510 Ω	HF45 5510	HF45 5510	560 kΩ	HJ35 8560	HF85 8560
560 Ω	HF45 5560	HF45 5560	680 kΩ	HJ35 8680	HF85 8680
680 Ω	HF45 5680	HF45 5680	820 kΩ	HJ35 8820	HF85 8820
820 Ω	HF45 5820	HF45 5820	1.0 MΩ	HF45 9100	HF45 9100
910 Ω	HF45 5910	HF45 5910	1.2 MΩ	HJ35 9120	*
1.0 kΩ	HF45 6100	HF45 6100	1.5 MΩ	HJ35 9150	HF85 9150
1.2 kΩ	HF45 6120	HF45 6120	1.8 MΩ	HJ35 9180	HF85 9180
1.5 kΩ	HF45 6150	HF45 6150	2.2 MΩ	HJ35 9220	HF85 9220
1.8 kΩ	HF45 6180	HF45 6180	3.3 MΩ	HJ35 9330	HF85 9330
2.0 kΩ	HJ35 6200	HF85 6200	3.9 MΩ	HJ35 9390	*
2.2 kΩ	HF45 6220	HF45 6220	4.7 MΩ	HJ35 9470	HF85 9470
2.4 kΩ	HJ35 6240	HF85 6240			
2.7 kΩ	HF45 6270	HF45 6270			
3.0 kΩ	HF45 6300	HF45 6300			
3.3 kΩ	HF45 6330	HF45 6330			
3.6 kΩ	HJ35 6360	HF85 6360			
3.9 kΩ	HF45 6390	HF45 6390			
4.7 kΩ	HF45 6470	HF45 6470			
5.1 kΩ	HF45 6510	HF45 6510			
5.6 kΩ	HF45 6560	HF45 6560			
6.8 kΩ	HF45 6680	HF45 6680			
8.2 kΩ	HF45 6820	HF45 6820			
9.1 kΩ	HF45 6910	HF45 6910			
10 kΩ	HF45 7100	HF45 7100			



\* : Not available

• OVERALL ASSEMBLY



Ref No.	Part No.	Description	Remarks	Markets
1	ZH227000	P. C. B. ASSEMBLY	DIGITAL	
* 4-2	ZH227400	P. C. B. ASSEMBLY	MAIN	UCA
* 4-2	ZH227500	P. C. B. ASSEMBLY	MAIN	RS
* 4-2	ZH227600	P. C. B. ASSEMBLY	MAIN	KBGL
* 6-1	ZH227800	P. C. B. ASSEMBLY	OPERATION	U
* 6-1	ZH227900	P. C. B. ASSEMBLY	OPERATION	C
* 6-1	ZH228000	P. C. B. ASSEMBLY	OPERATION	RS
* 6-1	ZH228100	P. C. B. ASSEMBLY	OPERATION	K
* 6-1	ZH228200	P. C. B. ASSEMBLY	OPERATION	A
* 6-1	ZH228300	P. C. B. ASSEMBLY	OPERATION	BG
* 6-1	ZH228400	P. C. B. ASSEMBLY	OPERATION	L
10	WW891000	AM/FM TUNER	FAEH08-W02	UCRLS
10	WW891100	AM/FM TUNER	FAEH08-E02	KABG
△ 11	WY040900	POWER CABLE	1. 8m	UC
△ 11	WY042500	POWER CABLE	1. 8m	R
△ 11	WY042400	POWER CABLE	1. 8m	K
△ 11	WY042100	POWER CABLE	1. 8m	A
△ 11	WY041100	POWER CABLE	1. 8m	B
△ 11	WY041700	POWER CABLE	1. 8m	GL
△ 11	ZC898500	POWER CABLE	1. 8m	S
16	MF109100	FLEXIBLE FLAT CABLE	9P 100mm P=1. 25	
* 17	MF105120	FLEXIBLE FLAT CABLE	5P 120mm P=1. 25	
△ * 25	YF668A00	POWER TRANSFORMER		UC
△ * 25	YF669A00	POWER TRANSFORMER		RS
△ * 25	YF670A00	POWER TRANSFORMER		K
△ * 25	YF671A00	POWER TRANSFORMER		AL
△ * 25	YF672A00	POWER TRANSFORMER		BG
101	WQ616500	TOP COVER		BL
101	WQ616600	TOP COVER		SI
* 103	ZG191900	REAR PANEL		UC
* 103	ZG192000	REAR PANEL		RS
* 103	ZG192300	REAR PANEL		KABGL
110	WQ379900	LEG	D60 H21	
111	WV002800	KNOB	INPUT	BL
111	WV002700	KNOB	INPUT	SI
112	WV004900	KNOB	VOLUME	BL
112	WV004800	KNOB	VOLUME	SI
113	WP083200	KNOB	TONE CONTROL	BL
113	WP083100	KNOB	TONE CONTROL	SI
* 114	ZJ461100	CAP	POWER	BL
* 114	ZJ461000	CAP	POWER	SI
* 115	ZG193100	KNOB	SELECT	BL
* 115	ZG193000	KNOB	SELECT	SI
116	WU966400	CAP	DIRECT	BL

\* New Parts

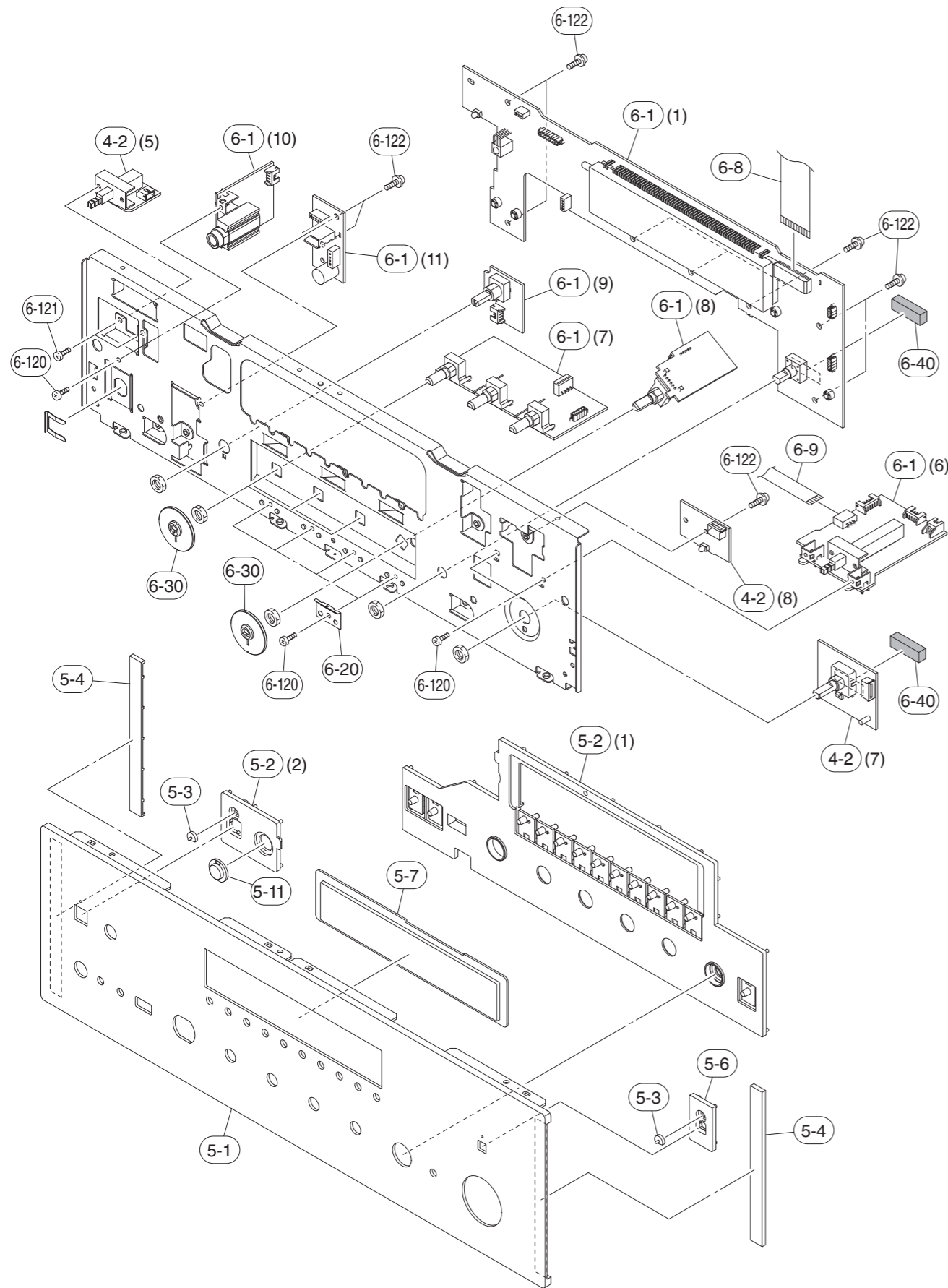
Finish ..... BL: Black color, SI: Silver color

Ref No.	Part No.	Description	Remarks	Markets
116	WU966300	CAP	DIRECT	SI
* 117	ZG193900	SUPPORT	PCB	
120	WE774100	BIND HEAD BONDING B-T. SCREW	3x8 MFZN2B3	
122	WU048900	BIND HEAD S-TIGHT SCREW	4x10 MFZN2W3	
123	WF002600	PW HEAD B-TIGHT SCREW	3x8 MFZN2W3	
124	VT669400	PW HEAD B-TIGHT SCREW	3x15-8 MFC2	
125	WF821300	BIND HEAD S-TIGHT SCREW	4x7 MFZN2W3	
126	VH313200	PW HEAD S-TIGHT SCREW	4x8-10 MFN13BL	BL
126	VDO69600	PW HEAD S-TIGHT SCREW	4x8-10 MFN133	SI
127	AA627310	GROUND TERMINAL		
129	WE774300	BIND HEAD B-TIGHT SCREW	3x8 MFZN2W3	
132	WQ790900	DAMPER	15x35x10	
133	WE877900	BIND HEAD S-TIGHT SCREW	3x6 MFZN2W3	
150	VQ368500	PUSH RIVET	P3545-B	
172	WE200500	DISH HEAD B-TIGHT SCREW	3x6 MFN13BL	BL
172	WE200400	DISH HEAD B-TIGHT SCREW	3x6 MFN133	SI
173	V2438700	CORD STOPPER	10P1	
* 174	ZH513300	SHEET	TOP COVER	L
175	WJ053800	RIVET	TOP COVER	L
180	WT769600	DAMPER	70x70x2	BG
181	WQ621800	DAMPER	2x10x310	BG
182	V5881100	CUSHION	5x8x25	
183	WC879000	DAMPER	SCREW MASK	
		ACCESSORIES		
* 200	ZH445400	REMOTE CONTROL	RAS9	000-213280010
200-1	WW606600	BATTERY COVER	CG-2209 Gray	10030-0057100
202	V6267000	FM ANTENNA	1. 4m 1pc	UCRLS
202	VQ147100	FM ANTENNA	1. 4m 1pc	KABG
203	VQ307400	AM ANTENNA	1. 2m 1pc	
		BATTERY	RO3, AAA, UM-4 2pcs	

\* New Parts

Finish ..... BL: Black color, SI: Silver color

• FRONT PANEL UNIT and SUB-CHASSIS UNIT



Ref No.	Part No.	Description	Remarks	Markets
* 4-2	ZH227400	P. C. B. ASSEMBLY	MAIN	UCA
* 4-2	ZH227500	P. C. B. ASSEMBLY	MAIN	RS
* 4-2	ZH227600	P. C. B. ASSEMBLY	MAIN	KBGL
5-1	ZG191700	FRONT PANEL	BL	
5-1	ZG191600	FRONT PANEL	SI	
5-2	ZG432900	SUB-PANEL	BL	
5-2	ZG432800	SUB-PANEL	SI	
5-3	WP080600	LENS LED		
5-4	WP081200	SIDE PLATE	BL	
5-4	WP081100	SIDE PLATE	SI	
5-6	WW649200	SUPPORT LENS	DIRECT	
* 5-7	ZG192800	WINDOW SHEET		
5-11	WK863700	LENS RC	PURPLE	BL
5-11	WK863600	LENS RC	MEDIUM	SI
* 6-1	ZH227800	P. C. B. ASSEMBLY	OPERATION	U
* 6-1	ZH227900	P. C. B. ASSEMBLY	OPERATION	C
* 6-1	ZH228000	P. C. B. ASSEMBLY	OPERATION	RS
* 6-1	ZH228100	P. C. B. ASSEMBLY	OPERATION	K
* 6-1	ZH228200	P. C. B. ASSEMBLY	OPERATION	A
* 6-1	ZH228300	P. C. B. ASSEMBLY	OPERATION	BG
* 6-1	ZH228400	P. C. B. ASSEMBLY	OPERATION	L
6-8	MF119500	FLEXIBLE FLAT CABLE	19P 500mm P=1.25	
* 6-9	MF107160	FLEXIBLE FLAT CABLE	7P 160mm P=1.25	
6-20	WP084400	SPRING		
6-30	WU966500	DISC	TONE CONTROL	
6-40	V5881100	CUSHION	5x8x25	
6-120	WE774300	BIND HEAD B-TIGHT SCREW	3x8 MFZN2W3	
6-121	WE877900	BIND HEAD S-TIGHT SCREW	3x6 MFZN2W3	
6-122	WF002600	PW HEAD B-TIGHT SCREW	3x8 MFZN2W3	

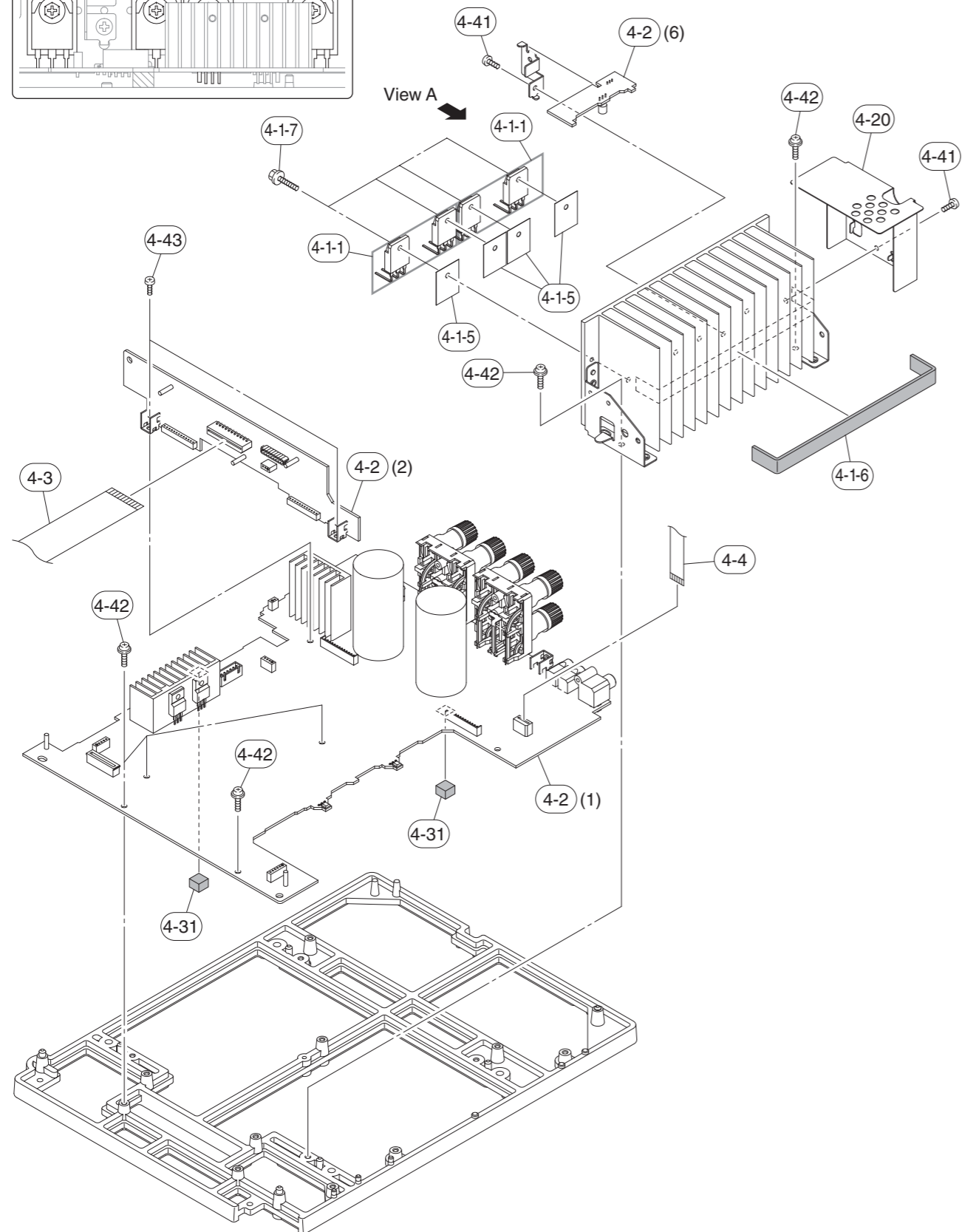
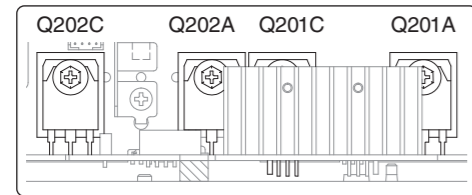
\* New Parts

Finish ..... BL: Black color, SI: Silver color



• AMP UNIT

View A



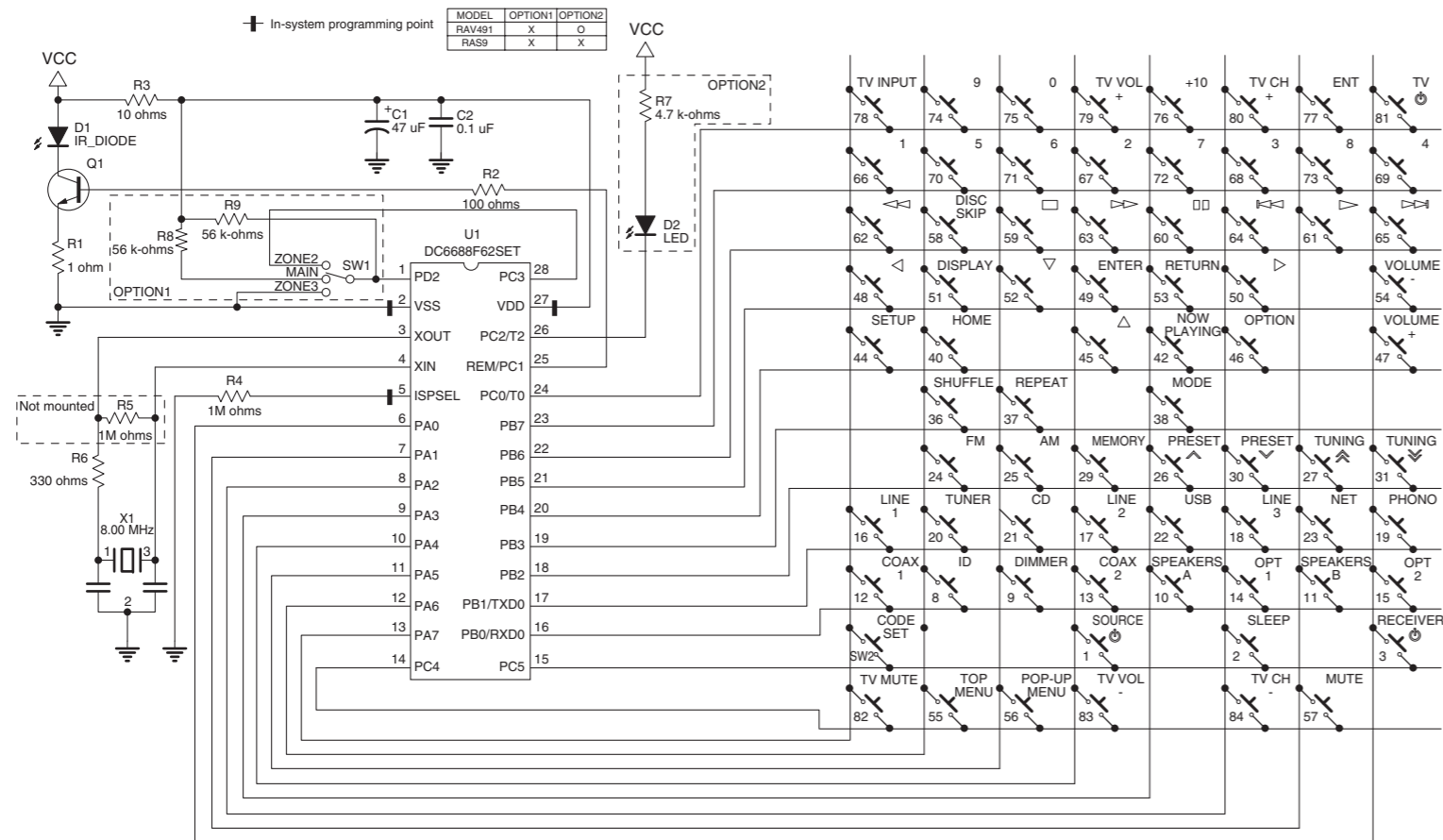
Ref No.	Part No.	Description	Remarks	Markets
# 4-1-1	VV586400	PAIR TRANSISTOR	2SA1695/C4468 OPY	Q201A, Q201C, Q202A, Q202C
4-1-5	VV849300	RADIATION SHEET	19x24	
4-1-6	VP922500	DAMPER	2x10x170	
4-1-7	WE774200	BIND HEAD B-TIGHT SCREW	3x10 MFZN2W3	
* 4-2	ZH227400	P. C. B. ASSEMBLY	MAIN	UCA
* 4-2	ZH227500	P. C. B. ASSEMBLY	MAIN	RS
* 4-2	ZH227600	P. C. B. ASSEMBLY	MAIN	KBGL
4-3	MF121100	FLEXIBLE FLAT CABLE	21P 100mm P=1.25	
* 4-4	MF106140	FLEXIBLE FLAT CABLE	6P 140mm P=1.25	
* 4-20	ZG193600	BARRIER		
* 4-31	ZJ031700	DAMPER	6x8x8	
4-41	WE774300	BIND HEAD B-TIGHT SCREW	3x8 MFZN2W3	
4-42	VB770200	PW HEAD P-TIGHT SCREW	3x10-8 MFC2	
4-43	WF268000	BIND HEAD P-TIGHT SCREW	3x10 MFZN2B3	

\* New Parts

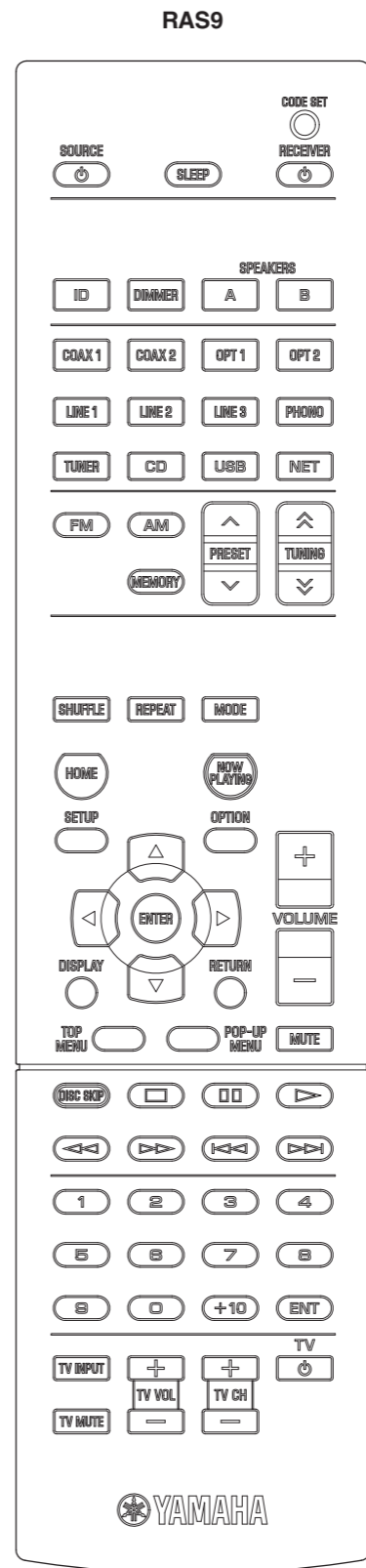
Finish ..... BL: Black color, SI: Silver color

**Note)** Those parts marked with “#” are not included in the P.C.B. assembly. **89**

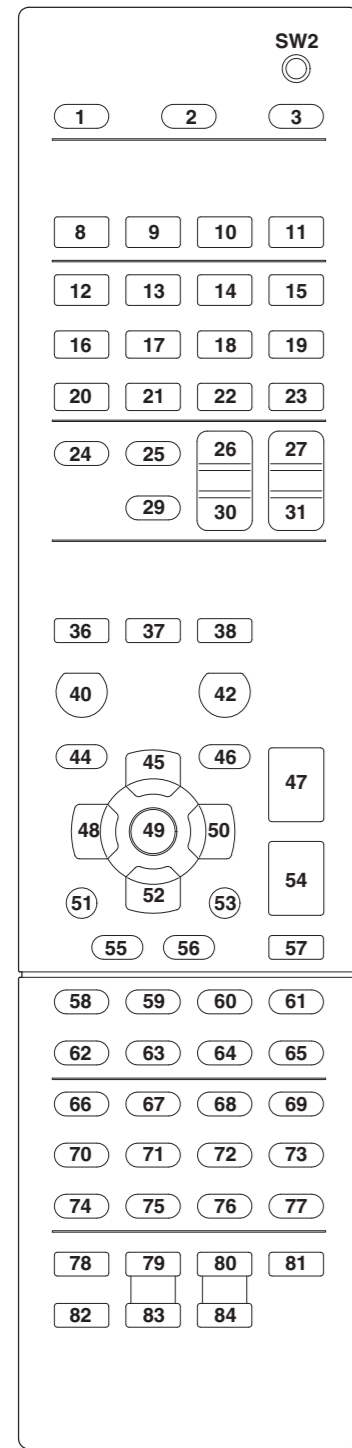
# REMOTE CONTROL SCHEMATIC DIAGRAM



# PANEL



## KEY NO. LAYOUT



## KEY CODE

## AMP MODE

Key No.	FUNCTION	ID1	ID2
SW2	CODE SET	[CODE SET]	[CODE SET]
1	SOURCE	79-60	79-609E
2	SLEEP	7A-30	7A-30CE
3	RECEIVER	7E-2A	7E-2AD4
8	ID	Shown "Function sheet"	
9	DIMMER	7A85-82FD	7A85-82FC
10	SPEAKERS A	7A85-9A65	7A85-9A64
11	SPEAKERS B	7A85-9B64	7A85-9B65
12	COAX 1	7A85-18E7	7A85-18E6
		Switch to "DEVICE" mode/go to COAX 1 page	
13	COAX 2	7F01-4AB5	7F01-4AB4
		Switch to "DEVICE" mode/go to COAX 2 page	
14	OPT 1	7A-532C	7A-532D
		Switch to "DEVICE" mode/go to OPT 1 page	
15	OPT 2	7A-5629	7A-5628
		Switch to "DEVICE" mode/go to OPT 1 page	
16	LINE 1	7A85-19E6	7A85-19E7
		Switch to "DEVICE" mode/go to LINE 1 page	
17	LINE 2	7A85-C13E	7A85-C13F
		Switch to "DEVICE" mode/go to LINE 2 page	
18	LINE 3	7A85-C03F	7A85-C03E
		Switch to "DEVICE" mode/go to LINE 3 page	
19	PHONO	7A85-14EB	7A85-14EA
		Switch to "DEVICE" mode/go to PHONO page	
20	TUNER	7A85-16E9	7A85-16E8
		Switch to "DEVICE" mode/go to TUNER page	
21	CD	7A85-15EA	7A85-15EB
		Switch to "DEVICE" mode/go to CD page	
22	USB	7F01-720D	7F01-720C
		Switch to "DEVICE" mode/go to USB page	
23	NET	7F01-3F	7F01-3FC1
		Switch to "DEVICE" mode/go to NET page	
24	FM	7F01-5827	7F01-5826
25	AM	7F01-552A	7F01-552B
26	PRESET	7F01-5B24	7F01-5B25
27	TUNING	7F01-611E	7F01-611F
29	MEMORY	7F01-6718	7F01-6719
30	PRESET	7F01-5E21	7F01-5E20
31	TUNING	7F01-641B	7F01-641A
36	SHUFFLE	7F01-46	7F01-46B8
37	REPEAT	7F01-45	7F01-45BB
38	MODE	7F01-66	7F01-6698
40	HOME	7A-C2	7A-C23C

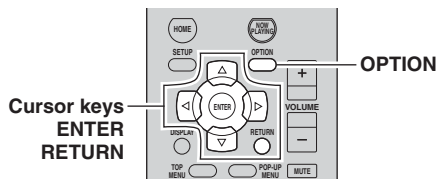
Key No.	FUNCTION	ID1	ID2
42	NOW PLAYING	7A-433C	7A-433D
44	SETUP	7A-84	7A-847A
45	(UP)	7A-9D	7A-9D63
46	OPTION	7A-6B14	7A-6B15
47	VOLUME +	7A-1A	7A-1AE4
48	(LEFT)	7A-9F	7A-9F61
49	ENTER	7A-DE	7A-DE20
50	(RIGHT)	7A-9E	7A-9E60
51	DISPLAY	7F01-60	7F01-609E
52	(DOWN)	7A-9C	7A-9C62
53	RETURN	7A-AA	7A-AA54
54	VOLUME -	7A-1B	7A-1BE5
55	TOP MENU	7A-A0DF	7A-A0DE
56	POP-UP MENU	7A-A4DB	7A-A4DA
57	MUTE	7A-1C	7A-1CE2
58	DISK SKIP	7986-4FB0	7986-4FB0
59	(STOP)	7F01-69	7F01-6997
60	(PAUSE)	7F01-67	7F01-6799
61	(PLAY)	7F01-68	7F01-6896
62	(REW)	7F01-6A	7F01-6A94
63	(FF)	7F01-6B	7F01-6B95
64	(SKIP -)	7F01-6C	7F01-6C92
65	(SKIP +)	7F01-6D	7F01-6D93
66	1	7F01-51	7F01-51AF
67	2	7F01-52	7F01-52AC
68	3	7F01-53	7F01-53AD
69	4	7F01-54	7F01-54AA
70	5	7F01-55	7F01-55AB
71	6	7F01-56	7F01-56A8
72	7	7F01-57	7F01-57A9
73	8	7F01-58	7F01-58A6
74	9	7F01-59	7F01-59A7
75	0	7F01-5A	7F01-5AA4
76	+10	7F01-5B	7F01-5BA5
77	ENT	7F01-5C	7F01-5CA2
78	TV INPUT	TV MODE	
79	TV VOL ( + )		
80	TV CH ( + )		
81	TV		
82	TV MUTE		
83	TV VOL ( - )		
84	TV CH ( - )		



## ■ SETUP MENU

### ▼ OPTION MENU

You can configure separate playback settings for different playback sources. This menu allows you to easily configure settings during playback.



#### 1 Press **OPTION**.



#### 2 Use the cursor keys to select an item and press **ENTER**.



To return to the previous state during menu operations, press **RETURN**.

#### 3 Use the cursor keys (◀/▶) to select a setting.

#### 4 To exit from the menu, press **OPTION**.

### *OPTION menu items*



Available items vary depending on the selected input source.

Item	Function
<b>Volume Trim</b>	Corrects volume differences between input sources.
<b>Signal Info</b>	Displays information about the audio signal.
<b>Auto Preset</b>	Automatically registers FM radio stations with strong signals as presets.
<b>Clear Preset</b>	Clear radio stations registered to preset numbers.
<b>TrafficProgram</b>	Automatically searches for a traffic information station.
<b>Repeat</b>	Configures the repeat setting for the iPod, USB storage device, or media server.
<b>Shuffle</b>	Configures the shuffle setting for the iPod, USB storage device, or media server.
<b>Vol.Interlock</b>	Enables/disables volume controls from iTunes/iPod via AirPlay.
<b>PandoraAccount Create Station Delete Station</b>	(While the Pandora station list is displayed) Configures the Pandora accounts and create/delete Pandora stations.
<b>RateThisTrack Bookmark WhyThisTrack?</b>	(While the Pandora playback information is displayed) Configures the track rating, bookmark, etc.

(B, G models)

(U, C, R, K, A, L, S models)

### ■ Volume Trim

Corrects volume differences between input sources. If you are bothered by volume differences when switching between input sources, use this function to correct it.



This setting is applied separately to each input source.

#### Setting range

-10.0 dB to +10.0 dB (0.5 dB increments)

#### Default

0.0 dB

### ■ Signal Info

Displays information about audio signal.

#### Choices

<b>FORMAT</b>	Audio format of the input signal
<b>CHAN</b>	If other than two-channel audio is being input, the indication will be “---.”
<b>SAMPL</b>	The number of samples per second of the input digital signal



To switch the information on the front display, press the cursor keys (Δ/▽) repeatedly.

### ■ Vol.Interlock

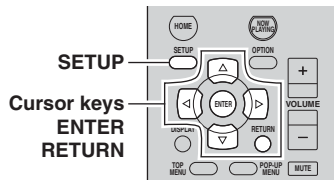
Enables/disables volume controls from iTunes/iPod via AirPlay.

#### Settings

<b>Off</b>	Disables volume controls from iTunes/iPod.
<b>Ltd (default)</b>	Enables volume controls from iTunes/iPod within the limited range (-80.0 dB to 0.0 dB and mute).
<b>Full</b>	Enables volume controls from iTunes/iPod in the full range (-80.0 dB to +16.5 dB and mute).

## ▼ SETUP MENU

You can configure the unit's various functions.



### 1 Press SETUP.



### 2 Use the cursor keys ( $\Delta/\nabla$ ) to select a menu.



### 3 Press ENTER.



### 4 Use the cursor keys ( $\leftarrow/\rightarrow$ ) to select a setting and press ENTER.



To return to the previous state during menu operations, press RETURN.

### 5 Exit from the menu, press SETUP.

## SETUP menu items

Menu item	Function	
Network Setup	Information	Displays the network information on the unit.
	IP Address	Configures the network parameters (such as IP address).
	MAC Filter	Filter Sets the MAC address filter to limit access to the unit from other network devices.
	DMC Control	Selects whether to allow a DLNA-compatible Digital Media Controller (DMC) to control playback.
	NET Standby	Selects whether to enable/disable the function that turns on the unit from other network devices.
	Network Name	Edits the network name (the unit's name on the network) displayed on other network devices.
Update	Updates the firmware via the network.	
Max Volume	Sets the maximum volume to prevent excessive loudness.	
Initial Volume	Sets the initial volume for when this receiver is turned on.	
AutoPowerStdby	Sets the amount of time for the auto-standby function.	
ECO Mode	Enables/disables the eco mode (power saving mode).	
DC OUT	Selects how to supply power through the DC OUT jack.	

## Network Setup

Configures the network settings.

### Information

Displays the network information on the unit.

<b>NewFwAvailable</b>	Appears if an update for this unit's firmware is available.
<b>STATUS</b>	The connection status of the NETWORK jack
<b>MAC</b>	MAC address
<b>IP</b>	IP address
<b>SUBNET</b>	Subnet mask
<b>GTWY</b>	The IP address of the default gateway
<b>DNS P</b>	The IP address of the primary DNS server
<b>DNS S</b>	The IP address of the secondary DNS server
<b>VTUNER</b>	The ID of the Internet radio (vTuner)

### IP Address

Configures the network parameters (such as IP address).

#### DHCP

Select whether to use a DHCP server.

<b>Off</b>	Does not use a DHCP server. Configure the network parameters manually. For details, see "Manual network settings".
<b>On (default)</b>	Uses a DHCP server to automatically obtain the unit's network parameters (such as IP address).

#### Manual network settings

##### 1 Set "DHCP" to "Off".

##### 2 Use the cursor keys ( $\Delta/\nabla$ ) to select a parameter type.

<b>Address</b>	Specifies an IP address.
<b>Subnet Mask</b>	Specifies a subnet mask.
<b>Default Gateway</b>	Specifies the IP address of the default gateway.
<b>DNS Server(P)</b>	Specifies the IP address of the primary DNS server.
<b>DNS Server(S)</b>	Specifies the IP address of the secondary DNS server.

##### 3 Use the cursor keys ( $\leftarrow/\rightarrow$ ) to select the edit position.



(Example: IP address setting)

Use the cursor keys ( $\leftarrow/\rightarrow$ ) to switch between segments (Address1, Address2...) of the address.

##### 4 Use the Cursor keys ( $\Delta/\nabla$ ) or numeric keys to change a value.

##### 5 To exit from the menu, press SETUP.

### MAC Filter

Sets the MAC address filter to limit access to the unit from other network devices.

#### Filter

Enables/disables the MAC address filter.

<b>Off (default)</b>	Disables the MAC address filter.
<b>On</b>	Enables the MAC address filter. In "MAC Address 01-10", specify the MAC addresses of the network devices that will be permitted access to the unit.

#### MAC address filter settings

##### 1 Set "Filter" to "On".

##### 2 Use the cursor keys ( $\Delta/\nabla$ ) to select an MAC address number (01 to 10).

##### 3 Use the cursor keys ( $\leftarrow/\rightarrow$ ) to move the edit position and the cursor keys ( $\Delta/\nabla$ ) to select a value.

##### 4 To exit from the menu, press SETUP.



When using "AirPlay" and "DMC Control", you cannot limit access from network devices regardless of the MAC address filter.

### DMC Control

Selects whether to allow DLNA-compatible Digital Media Controller (DMC) to control playback.

<b>Disable</b>	Does not allow DMCs to control playback.
<b>Enable (default)</b>	Allows DMCs to control playback.



A Digital Media Controller (DMC) is a device that can control other network devices through the network. When this function is enabled, you can control playback of the unit from DMCs (such as Windows Media Player 12) on the same network.

### NET Standby

Selects whether the unit can be turned on from other network devices (network standby).

<b>Off (default)</b>	Disables the network standby function.
<b>On</b>	Enables the network standby function. (The unit consumes more power than when "Off" is selected.)

## ■ Network Name

Edits the network name (the unit's name on the network) displayed on other network devices.

### 1 Select "Network Name".



### 2 Press ENTER to enter the name edit display.



### 3 Use the cursor keys (</>) to move the edit position and the cursor keys (△/▽) to select a character.



### 4 To confirm the new name, press ENTER.

### 5 To exit from the menu, press SETUP.

## ■ Update

Updates the firmware via the network.

<b>Perform Update</b>	Starts the process to update the unit's firmware. For details, see "Updating the unit's firmware via the network".
<b>Version</b>	Displays the version of the firmware installed on the unit.
<b>ID</b>	Displays the system ID number.

## Max Volume

Sets the maximum volume to prevent excessive loudness.

### Setting range

-30.0 dB to +15.0 dB (5.0 dB increments), +16.5 dB

### Default

+16.5 dB

## Initial Volume

Sets the initial volume when the receiver is turned on.

<b>Off (default)</b>	Sets the level to the volume level of the unit when it last entered standby mode.
<b>Mute</b>	Sets the unit to mute the audio output.
<b>-80.0 dB to +16.5dB (0.5 dB increments)</b>	Sets the level to the specified volume level.

## AutoPowerStdby

Sets the amount of time for the auto-standby function. If you do not operate the unit for the specified time, the unit will automatically go into standby mode.

<b>Off (default)</b> (U, C, R, K, A, L, S models)	Does not set the unit to standby mode automatically.
<b>2 hours,</b> <b>4 hours,</b> <b>8 hours (default),</b> <b>12 hours</b> (B, G models)	Sets the unit to standby mode when you have not operated the unit for the specified time. For example, when "2 hours" is selected, the unit will switch to standby mode if you do not operate it for 2 hours.



Just before the unit enters standby mode, "AutoPowerStdby" appears and then countdown starts in the front display.

## ECO Mode

Enables/disables the eco (power saving) mode. When the eco mode is enabled, you can reduce the unit's power consumption.

<b>Off (default)</b>	Disables the eco mode.
<b>On</b>	Enables the eco mode.

### Notes

- Be sure to press ENTER to restart the unit after selecting a setting. The new setting will take effect after the unit is restarted.
- When "ECO Mode" is set to "On", the front display may become dark.
- If you want to play audio at high volume, set "ECO Mode" to "Off".

## DC OUT

Configures the DC OUT jack setting.

### Power Mode

Selects how to supply power to the Yamaha AV accessory connected to the DC OUT jack.

<b>Cont (default)</b>	Supplies power through the DC OUT jack continuously regardless of the power state (on/standby) of the unit.
<b>Sync</b>	Supplies power through the DC OUT jack only when the unit is turned on.

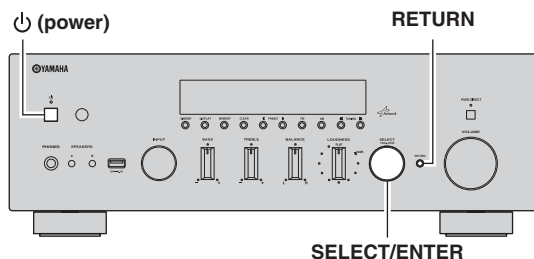


## ▼ ADVANCED SETUP MENU

Configure the system settings of the unit while viewing the front display.

**1** Turn off the unit.

**2** While holding down RETURN on the front panel, press  $\text{\textcircled{P}}$  (power).



**3** Rotate SELECT/ENTER to select an item.

**4** Press SELECT/ENTER to select a setting.

**5** Press  $\text{\textcircled{P}}$  (power) to set the unit to turn off and turn it on again.

The new settings take effect.

### ADVANCED SETUP menu items

Item	Function
SP IMP.	Changes the speaker impedance setting.
REMOTE ID	Selects the unit's remote control ID.
INIT	Restores the default settings.
UPDATE	Updates the firmware.
VERSION	Checks the version of firmware currently installed on the unit.

### Changing the speaker impedance setting (SP IMP.)

SP IMP. ■ 8ΩMIN

Change the unit's speaker impedance settings depending on the impedance of the speakers connected.

#### Settings

4 Ω MIN	Select this option when you connect 4-ohm speakers to the unit.
8 Ω MIN (default)	Select this option when you connect 8-ohm or higher speakers to the unit.

### Selecting the remote control ID (REMOTE ID)

REMOTE ID ■ ID2

Change the unit's remote control ID so that it matches the remote control's ID (default: ID2). When using multiple Yamaha AV receivers, you can set each remote control with a unique remote control ID for its corresponding receiver.

#### Settings

ID1, ID2 (default)

#### ■ Changing the remote control ID of the remote control

**1** To select ID1, while holding down the ID, hold down numeric key "1" for more than 3 seconds.

To select ID2, while holding down the ID, hold down numeric key "2" for more than 3 seconds.

Once the remote control code is successfully registered, "Rem: Success" appears on the front display.

If "Rem: Fail" appears on the front display, registration has failed. Repeat from Step 1.



The registered remote control codes are not cleared even if you change the remote control ID.

## Restoring the default settings (INIT)



Restores the default settings for the unit.

### Choices

ALL	Restores the default settings for the unit.
CANCEL	Does not perform an initialization.

## Updating the firmware (UPDATE)



New firmware that provides additional features or product improvements will be released as needed. Updates can be downloaded from our website. If the unit is connected to the Internet, you can download the firmware via the network. For details, refer to the information supplied with updates.

### ■ Firmware update procedure

Do not perform this procedure unless firmware update is necessary. Also, make sure you read the information supplied with updates before updating the firmware.

- 1 Press SELECT/ENTER repeatedly to select “USB” or “NETWORK” and press DISPLAY to start firmware update.

### Choices

USB	Update the firmware using a USB memory device.
NETWORK	Update the firmware via the network.



If the unit detects newer firmware over the network, “NewFwAvailable” appears as the “Information” menu item in “Network Setup”. In this case, you can also update the unit’s firmware by following the procedure in “Updating the unit’s firmware via the network”.

## Checking the firmware version (VERSION)

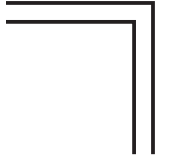
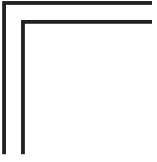


Check the version of firmware currently installed on the unit.



- You can also check the firmware version in “Update” in the “SETUP” menu.
- It may take a while until the firmware version is displayed.

MEMO



# R-N500

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