

Service Manual

Telephone Equipment

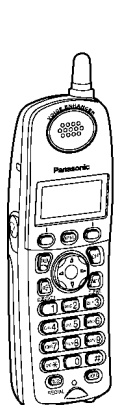
Caller ID Compatible

KX-TG5621BXS KX-TGA561BXS

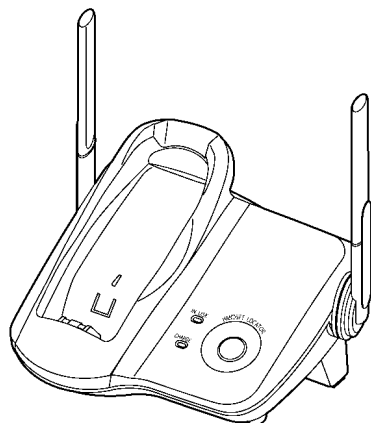
5.8 GHz Digital Cordless Phone

Silver Version

(for Asia, Middle Near East and Other area)



(Handset)



(Base Unit)

SPECIFICATIONS

	Base Unit	Handset
Power Supply	AC Adaptor (PQLV1BXY, 220-240 V AC, 50/60 Hz)	Rechargeable Ni-MH battery (3.6 V, 830 mAh) HHR-P104A
Power Output	200mW (max.)	200mW (max.)
Receiving/Transmitting Frequency	89 channels within 5.76 GHz-5.84 GHz	89 channels within 5.76 GHz-5.84 GHz
Receiving Method	Super Heterodyne	Super Heterodyne
Oscillation Method	PLL synthesizer	PLL synthesizer
Detecting Method	Quadrature Discriminator	Quadrature Discriminator
Tolerance of OSC Frequency	13.824 MHz $\pm$ 270 Hz	13.824 MHz $\pm$ 100 Hz
Modulation Method	Frequency Modulation	Frequency Modulation
Spread spectrum Method	Frequency Hopping Spread spectrum	Frequency Hopping Spread spectrum
ID Code	19 bit	22 bit
Security Codes	—	1,000,000
Ringer Equivalence No. (REN)	0.1	—
Dialing Mode	—	Tone (DTMF)/Pulse
Redial	—	Up to 48 digits
Speed Dialer	—	Up to 32 digits (Phone book)
Power Consumption	Standby: Approx. 2.0 W, Maximum: Approx. 5.6 W	11 days at Standby, 5 hours at Talk
Operating Environment	5°C - 40 °C (41 °F - 104 °F)	5°C - 40 °C (41 °F - 104 °F)
Dimensions (H x W x D)	Approx. 95 mm $\times$ 174 mm $\times$ 143 mm (3 ³ / ₄ " $\times$ 6 ²⁷ / ₃₂ " $\times$ 5 ⁵ / ₈ ")	Approx. 173 mm $\times$ 48 mm $\times$ 33 mm (6 ¹³ / ₁₆ " $\times$ 1 ⁷ / ₈ " $\times$ 1 ⁵ / ₁₆ ")
Mass (Weight)	Approx. 260 g	Approx. 170 g

- Optional Headset: KX-TCA89BX
- Design and specifications are subject to change without notice.
- The illustrations in this Service Manual may vary slightly from the actual product.

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF.

Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.

When this mark does appear, please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

Panasonic

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**WARNING**

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.

Note:

Because CONTENTS 4 is the extract from the Operating Instructions of this model, it is subject to change without notice. You can download and refer to the original Operating Instructions on TSN Server for further information.

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1 ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:

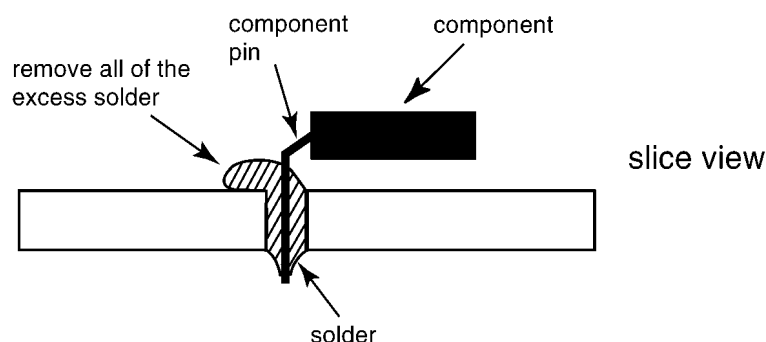
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

We will use PbF solder when discussing the lead free solder used in our manufacturing process which is made from Tin (Sn), Silver (Ag), and Copper (Cu).

This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder.

Caution

- PbF solder has a melting point that is 50°F ~ 70° F (30°C ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700°F ± 20° F (370°C ± 10°C).
- Exercise care while using higher temperature soldering irons.:
Do not heat the PCB for too long time in order to prevent solder splash or damage to the PCB.
- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F (600°C).
- When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See the figure below).



1.1. Suggested PbF Solder

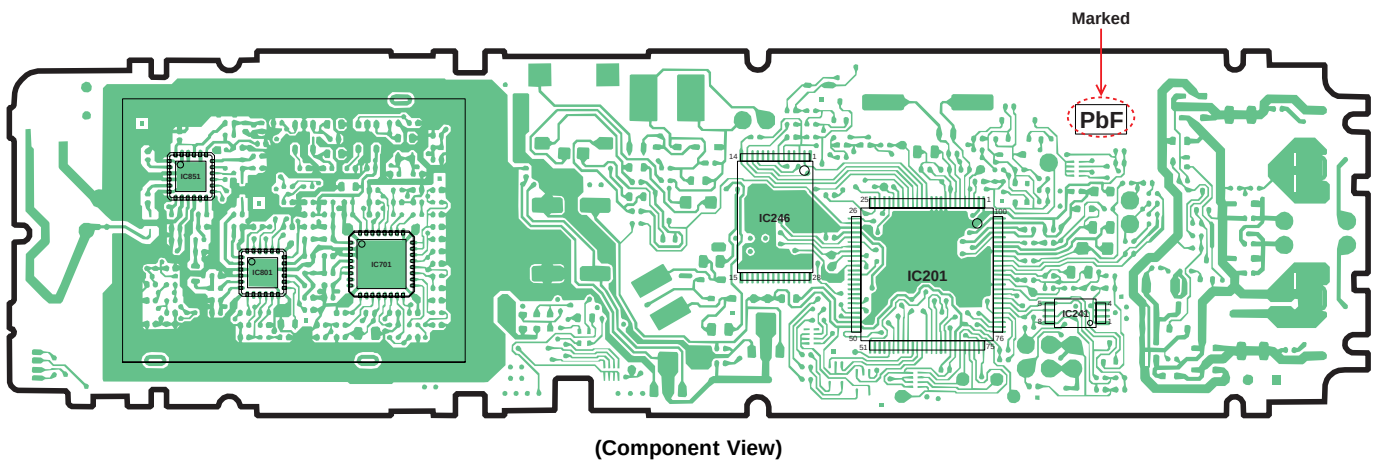
There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper (Sn+Ag+Cu), you can also use Tin and Copper (Sn+Cu), or Tin, Zinc, and Bismuth (Sn+Zn+Bi). Please check the manufacturer's specific instructions for the melting points of their products and any precautions for using their product with other materials.

The following lead free (PbF) solder wire sizes are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.

0.3mm X 100g	0.6mm X 100g	1.0mm X 100g

1.2. How to Recognize that Pb Free Solder is Used

(Example: Handset P.C.B.)



Note:

The location of the “PbF” mark is subject to change without notice.

2 FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help prevent recurring malfunctions.

1. Cover plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on worktable.
4. Do not grasp IC or LSI pins with bare fingers.

3 CAUTION

1. Danger of explosion if battery is incorrectly replaced.
2. Replace only with the same or equivalent type recommended by the manufacturer.
3. Dispose of used batteries according to the manufacturer’s Instructions.

4 OPERATING INSTRUCTIONS

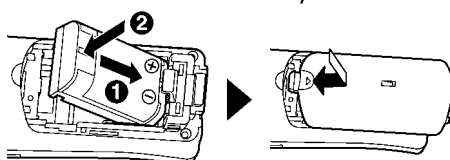
4.1. Battery

4.1.1. Battery Installation/Replacement

- 1 Press the notch of the handset cover firmly, and slide it in the direction of the arrow.
 - If necessary, remove the old battery.



- 2 Insert the battery (1), and press it down until it snaps into position (2). Then close the handset cover.

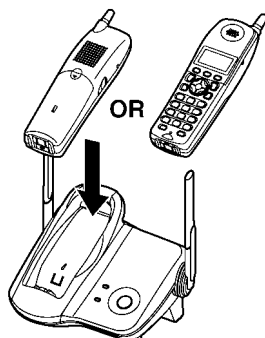


Important:

- Use only the rechargeable Panasonic battery HHR-P104A.

4.1.2. Battery Charge

Place the handset on the base unit for **7 hours** before initial use. While charging, "Charging" is displayed and the CHARGE indicator on the base unit lights. When the battery is fully charged, "Charge completed" is displayed.



Note:

- If you want to use the unit immediately, charge the battery for at least 15 minutes.
- To ensure that the battery charges properly, clean the charge contacts of the handset and base unit with a soft, dry cloth. Clean if the unit is subject to the exposure of grease, dust, or high humidity.

Note for service:

The battery strength may not be indicated correctly if the battery is disconnected and connected again, even after it is fully charged. In that case, by recharging the battery as mentioned above, you will get a correct indication of the battery strength.

4.1.3. Battery Level

Battery icon	Battery level
	Fully charged
	Medium
	Low Flashing: needs to be recharged.
	Empty

Note:

- When the battery needs to be charged, the handset beeps intermittently while it is in use.

4.1.4. Panasonic Battery Performance

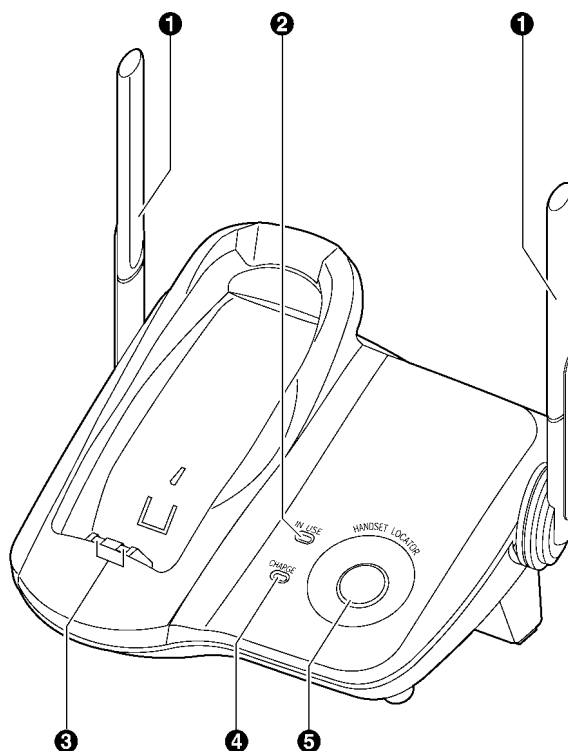
Operation	Operating time
While in use (talking)	Up to 5 hours
While not in use (standby)	Up to 11 days
While using the clarity booster feature	Up to 3 hours

Note:

- Battery operating time may be shortened over time depending on usage conditions and surrounding temperature.
- Battery power is consumed whenever the handset is off the base unit, even when the handset is not in use. Hence the longer you leave the handset off the base unit, the less time you may actually talk using the handset.
- After the handset is fully charged, displaying “**Charge completed**”, it may be left on the base unit (or charger) without any ill effect on the battery.
- The battery level may not be displayed correctly after you replace the battery. In this case, place the handset on the base unit and let charge for 7 hours.

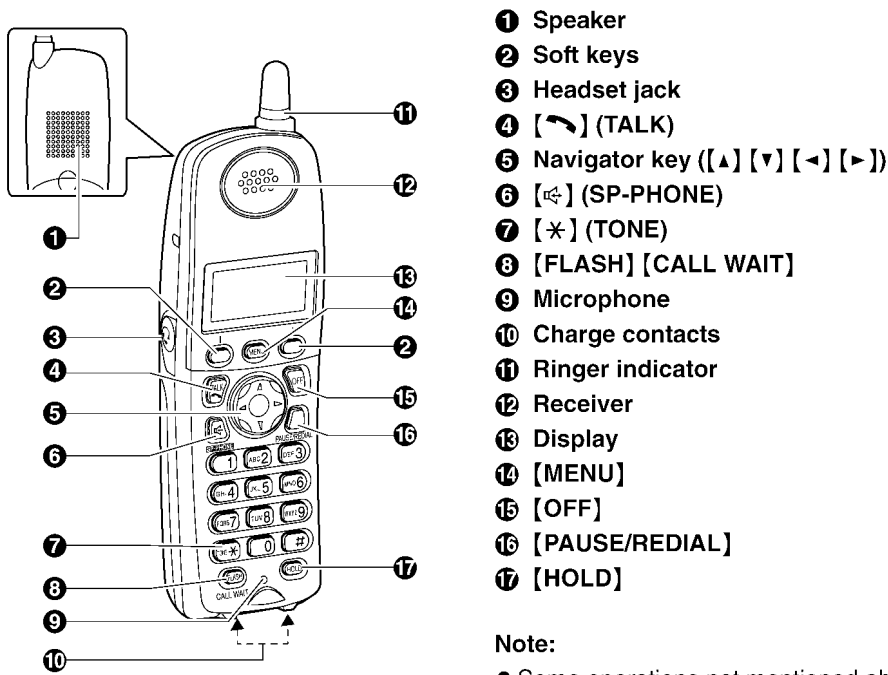
4.2. Location of Controls

4.2.1. Base Unit



- ❶ Antennas
- ❷ IN USE indicator
- ❸ Charge contacts
- ❹ CHARGE indicator
- ❺ [HANDSET LOCATOR]

4.2.2. Handset



Note:

- Some operations not mentioned above are displayed as soft key selections during operation.
Example: [Mute]

4.3. Displays

4.3.1. Display Items

Handset display items

Displayed item	Meaning
[[VE]]	Voice enhancer is on.
[]	Battery level

4.3.2. Troubleshooting (Handset LCD)

If the unit detects a problem, one of the following messages is shown on the display.

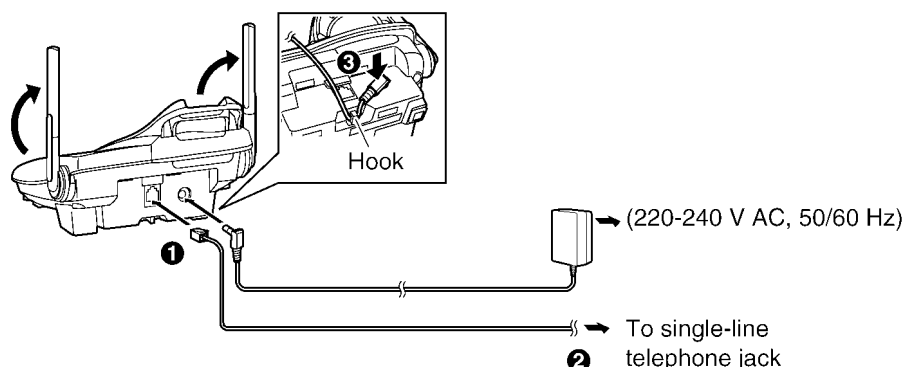
Display message	Cause/solution
Dial locked	● Dial lock is turned on. To turn it off, see "Dial Lock".
Error!!	● The handset's registration has failed. Move the handset and base unit away from all electrical appliances and try again. ● The entered password was wrong in programming dial lock. Enter the correct password.
No items stored	● Your phonebook or redial list is empty.
No link to base. Move closer to base, try again.	● The handset has lost communication with the base unit. Move closer to the base unit, and try again. ● Confirm that the base unit's AC adaptor is plugged in. ● Raise the base unit antennas. ● The handset's registration may have been canceled. Re-register the handset.
Phonebook full	● There is no space to store new items in the phonebook. Erase unnecessary items.
Please lift up and try again.	● A handset button was pressed while the handset was on the base unit. Lift the handset and press the button again.

4.4. Settings

4.4.1. Connecting the AC adaptor and telephone line cord

Connect the telephone line cord until it clicks into the base unit (❶) and telephone line jack (❷). Connect the AC adaptor cord by pressing the plug firmly (❸).

- Use only the included Panasonic AC adaptor PQLV1BXY.



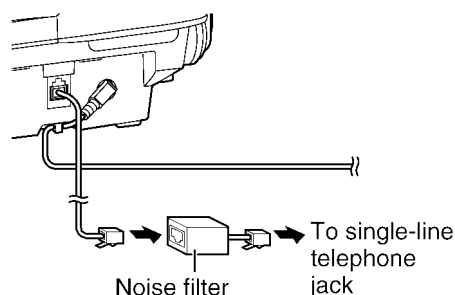
Note:

- The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)
- The AC adaptor should be connected to a vertically oriented or floor-mounted AC outlet. Do not connect the AC adaptor to a ceiling-mounted AC outlet, as the weight of the adaptor may cause it to become disconnected.
- When more than one unit is used, the units may interfere with each other. To prevent or reduce interference, please keep ample space between the base units.
- The unit will not work during a power failure. We recommend connecting a standard telephone to the same telephone line or to the same telephone jack using a T-adaptor. Emergency power can be supplied to the unit by connecting a Panasonic battery back-up power supply.

If you subscribe to a DSL service

Please attach a noise filter (contact your DSL provider) to the telephone line between the base unit and the telephone line jack in the event of the following:

- Noise is heard during conversations.
- Call Display features do not function properly.



4.4.2. Programmable settings

You can customize the unit by programming the following features using the handset. To access the features, there are 2 methods: scrolling through the display menus or using the direct commands.

- Mainly the direct command method is used in this Service Manual.

4.4.2.1. Programming by scrolling through the Display Menus

1 [MENU]

2 Press [▲] or [▼] to select the desired menu. → [Select]

- If there is a sub-menu(s), press [▲] or [▼] to select the desired item. → [Select]

Example: To access the handset ringer tone setting

Press [▲] or [▼] to select "Ringer setting". → [Select]

Then press [▲] or [▼] to select "Ringer tone". → [Select]

3 Press [▲] or [▼] to select the desired setting.

- This step may vary depending on the feature being programmed.

4 [Save] → [OFF]

Main menu	Sub-menu 1	Sub-menu 2
Ringer setting	Ringer volume	—
	Ringer tone	—
	Ring color	—
Date and time	—	—
Voice enhancer	—	—
Dial lock	—	—
Initial setting	LCD contrast	—
	Key tone	—
	Auto talk	—
	Set area code	—
	Time adjustment	—
	Set tel line	Set dial mode
		Set flash time
		Set line mode
	Registration	—

4.4.2.2. Programming using the Direct Commands

1 [MENU]

2 Enter the desired feature code.

3 Enter the desired setting code.

- This step may vary depending on the feature being programmed.

Note:

- In the following table, < > shows the default setting.
- If you make a mistake or enter the wrong code, press **[OFF]**, then start again by pressing **[MENU]**.

4 [Save] → [OFF]

Feature	Feature code	Setting code
Auto talk ^{*1}	[0][3]	[1]: On [0]: <Off>
Date and time	[4]	—
Dial lock	[6]	—
Key tone ^{*2}	[0][2]	[1]: <On> [0]: Off
LCD contrast (Display contrast)	[0][1]	[1]–[6]: Level 1–6 <3>
Registration	[0][0]	—
Ring color (Ringer indicator color)	[1][4]	[1]: <Color1>=Amber [2]: Color2=Green [3]: Color3=Red [4]: Multicolor
Ringer tone	[1][2]	[1]–[3]: Tone <1>–3 [4]–[7]: Melody 1–4
Ringer volume	[1][1]	[1]: Low [2]: Medium [3]: <High> [0]: Off
Set area code	[0][4]	—
Set dial mode	[0][5][1]	[1]: Pulse [2]: <Tone>
Set flash time ^{*3}	[0][5][2]	[1]: <700ms> [2]: 600ms [3]: 400ms [4]: 300ms [5]: 250ms [6]: 110ms [7]: 100ms [8]: 90ms
Set line mode ^{*4}	[0][5][3]	[1]: A [2]:
Time adjustment ^{*5} (Caller ID subscribers only)	[0][9]	[1]: Caller ID[auto] [0]: <Manual>
Voice enhancer	[5]	[1]: On [0]: <Off>

*1 If you subscribe to Caller ID service and want to view the caller's information after lifting up the handset to answer a call, turn off this feature.

*2 You can select whether or not key tones are heard when keys are pressed. Includes confirmation tones and error tones.

*3 The flash time depends on your telephone exchange or host PBX. Consult your PBX supplier if necessary.

*4 Generally, the line mode setting should not be adjusted. If "Line in use" is not displayed when another phone connected to the same line is in use, you need to change the line mode to "A".

*5 If the caller ID time and date display service is available in your area, this feature allows the unit to automatically adjust the date and time setting when caller information is received. To use this feature, set the date and time first.

4.4.3. Dial Lock

This feature prohibits making outside calls. The default setting is OFF.

Important:

- When dial lock is turned on, only phone numbers stored in the phonebook as emergency numbers (numbers stored with a # at the beginning of the name) can be dialed using the phonebook. We recommend storing emergency numbers in the phonebook before using this feature.
- When dial lock is turned on, you cannot store, edit, or erase items in the phonebook.

To turn dial lock on

1 [MENU] → [6]

2 Enter a 4-digit password*.

- This password is required when turning dial lock off. We recommend writing the password down.

3 [Save] → [Yes] → [OFF]

Note:

- If dial lock is turned on, the handset displays “Dial lock”. While there are missed calls, “Dial lock” is not displayed when the handset is off the base unit.

To turn dial lock off

1 [MENU] → [6]

2 Enter the same password* that was entered when dial lock was turned on.

3 [Save] → [Yes] → [OFF]

For Service Hint:

*: If the current password is forgotten, enter “726276642” and you will be able to go to step 3.

4.5. Troubleshooting

General use

Problem	Cause/solution
The unit does not work.	• Make sure the battery is installed correctly and fully charged. • Check the connections. • Unplug the base unit's AC adaptor to reset the unit. Reconnect the adaptor and try again. • The handset has not been registered to the base unit. Register the handset.
I cannot hear a dial tone.	• Confirm the telephone line cord is properly connected. • Disconnect the unit from the telephone line and connect a known working telephone. If the working telephone operates properly, contact our service personnel to have the unit repaired. If the working telephone does not operate properly, contact your telephone company.

Programmable settings

Problem	Cause/solution
While programming, the handset starts to ring.	• A call is being received. Answer the call and start again after hanging up.

Battery recharge

Problem	Cause/solution
I charged the battery fully, but  continues to flash, or  is displayed.	• Clean the charge contacts and charge again. • The battery may need to be replaced with a new one.
The handset display is blank.	• Confirm that the battery is properly installed. • Fully charge the battery.

Making/answering calls, intercom

Problem	Cause/solution
Static is heard, sound cuts in and out. Interference from other electrical units.	• Move the handset and the base unit away from other electrical appliances. • Move closer to the base unit. • Raise the base unit antennas. • Turn on the clarity booster feature. • If your unit is connected to a telephone line with DSL service, we recommend connecting a noise filter between the base unit and the telephone line jack. Contact your DSL provider for details.
The handset does not ring.	• The ringer volume is turned off. Adjust it.
I cannot make a call.	• The dialing mode may be set incorrectly. Change the setting. • Dial lock is turned on. To turn it off, see "Dial Lock".
I cannot redial by pressing [REDIAL] .	• If the last number dialed was more than 48 digits long, the number will not be redialed correctly. Dial the number manually. • Dial lock is turned on. To turn it off, see "Dial Lock".
I cannot have a conversation using the headset.	• Make sure that an optional headset is connected properly. • If "SP-phone" is displayed on the handset, press [hook icon] to switch to the headset.
I cannot page the handset.	• The called handset is too far from the base unit. • The called handset is in use. Try again later.

Caller ID

Problem	Cause/solution
The handset does not display the caller's phone number.	• You have not subscribed to Caller ID service. Contact your telephone company to subscribe. • If your unit is connected to any additional telephone equipment such as a Caller ID box or cordless telephone jack, disconnect the unit from the equipment and plug the unit directly into the wall jack. • If your unit is connected to a telephone line with DSL service, we recommend connecting a noise filter between the base unit and the telephone line jack. Contact your DSL provider for details. • Other telephone equipment may be interfering with this unit. Disconnect the other equipment and try again. • The caller requested not to send caller information.
Time setting is erased, and "ⓘ Press MENU." flashes on the handset display.	• If a power failure occurs, time setting may be erased. Set the date and time again.

5 DISASSEMBLY INSTRUCTIONS

5.1. Base Unit

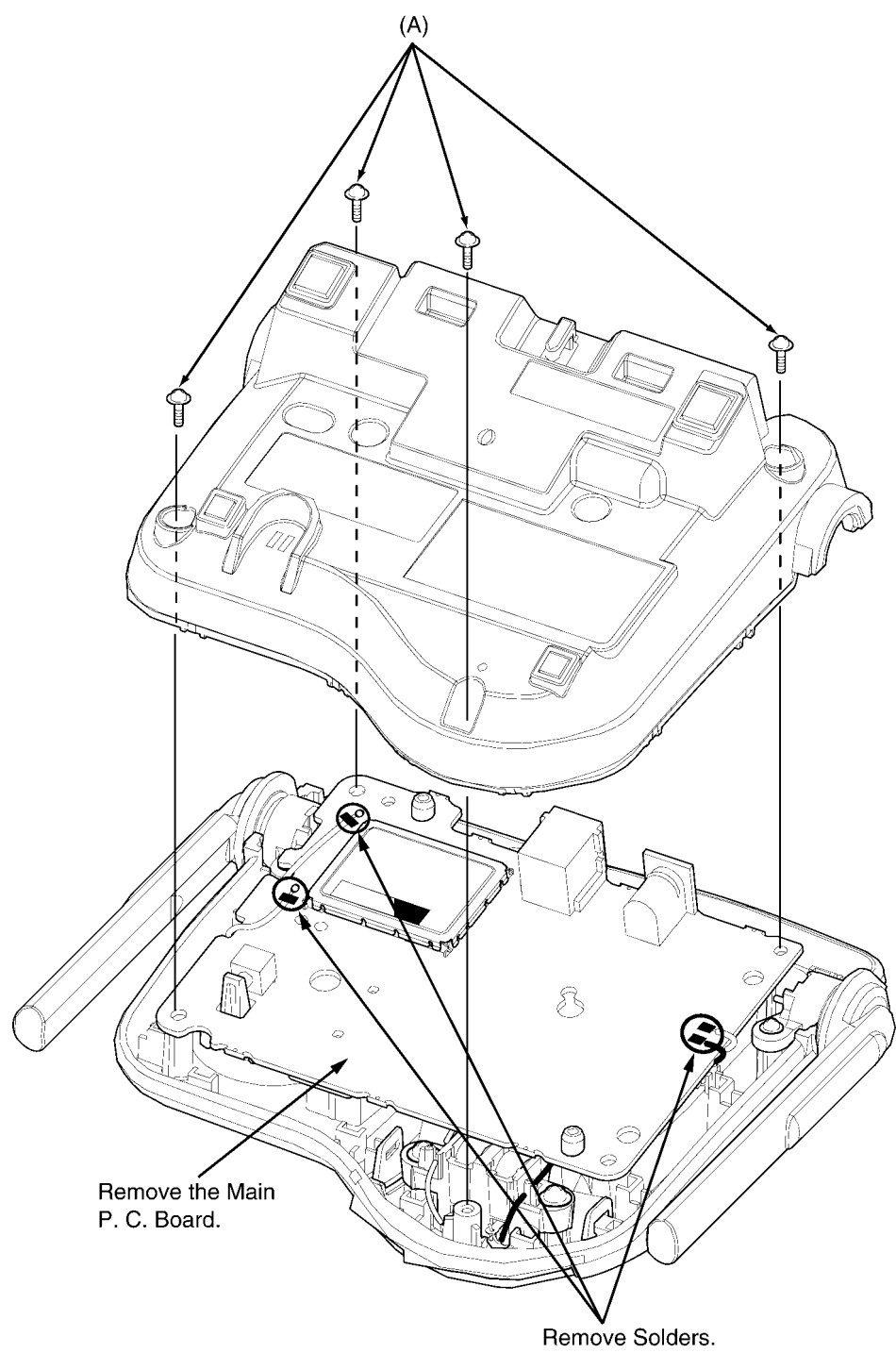


Fig. 1

Shown in Fig.-	To Remove -	Remove -
1	Cabinet Cover	Screws (2.6 × 12).....(A) × 4
	Main P.C. Board	Solders
		Main P.C. Board

5.2. Handset

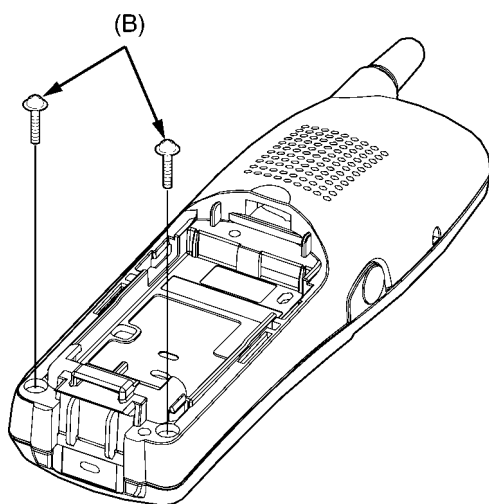


Fig. 2

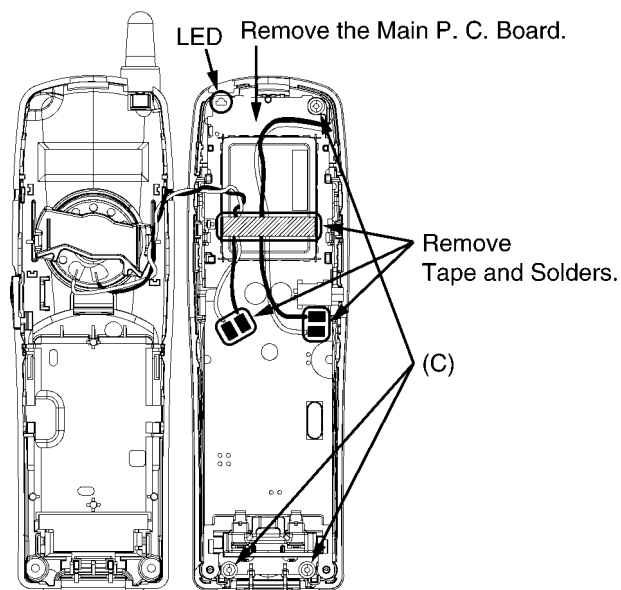
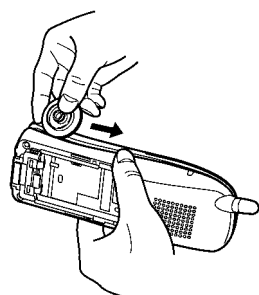
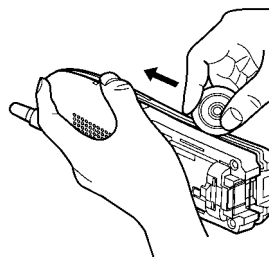


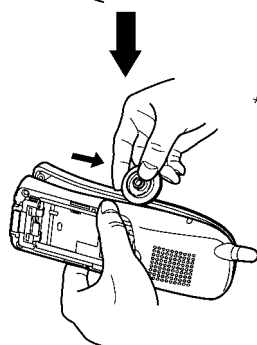
Fig. 4



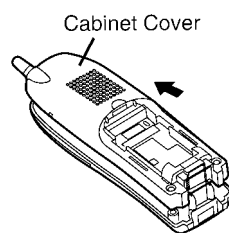
Insert a JIG (PQDJ10006Y) between the Cabinet Body and the Cabinet Cover, then pull it along the gap to open the Cabinet.



Likewise, open the other side of the Cabinet.



* Be careful not to damage LED. Refer to Fig. 5.



Cabinet Cover

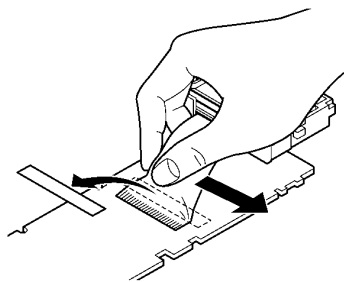
Remove the Cabinet Cover by pushing it upward.

Fig. 3

Shown in Fig.-	To Remove -	Remove -
2	Cabinet Cover	Screws (2 × 14).....(B) × 2
3		Follow the procedure
4	Main P.C. Board	Tape and Solders
		Screws (2 × 9).....(C) × 3
		Main P.C. Board

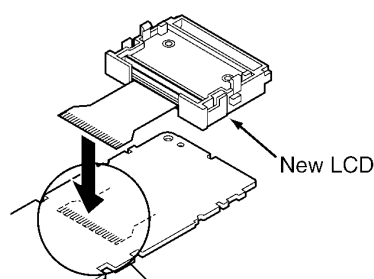
6 HOW TO REPLACE THE HANDSET LCD

①



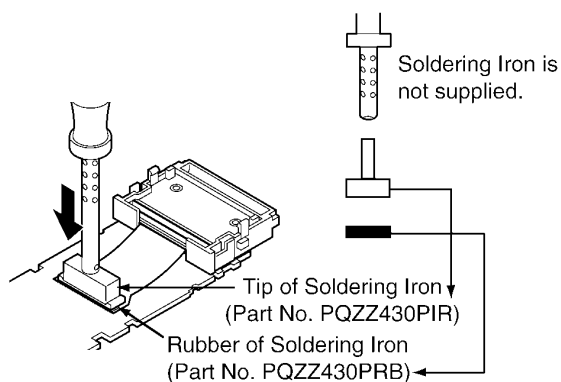
Remove the tape, and then peel off the FFC (Flexible Flat Cable) of LCD in the direction of the arrow not to damage the foil on the P.C. Board.

②



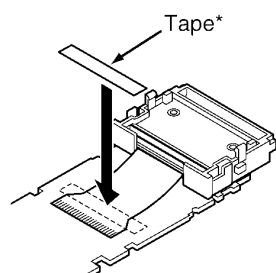
Fit the Heatseal of a New LCD to the P.C. Board.

③



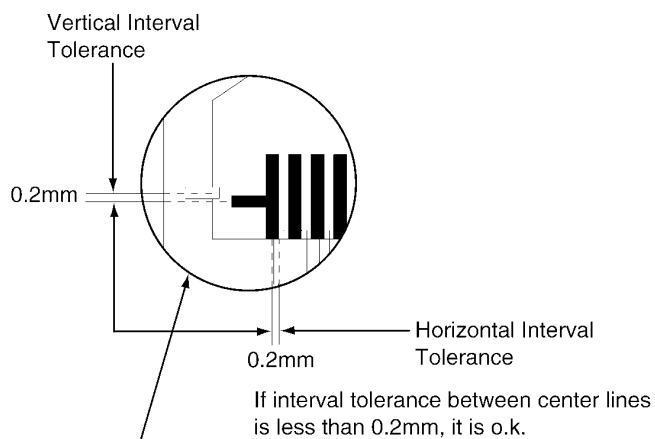
Heatweld with the Tip of Soldering Iron about 5 to 8 seconds (in case of 60W soldering iron).

④

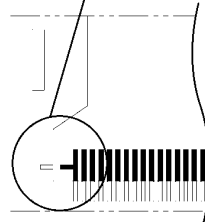


Stick the Tape* over the Heatseal.

* Use the Tape which was removed first.

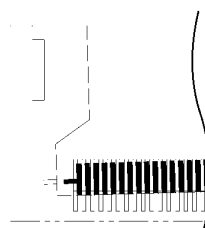


OK



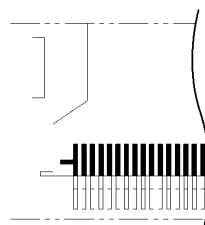
NG

(Inclined)



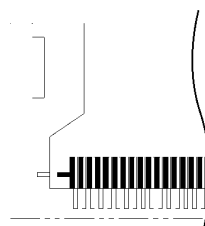
NG

(Vertical interval tolerance is more than 0.2mm.)



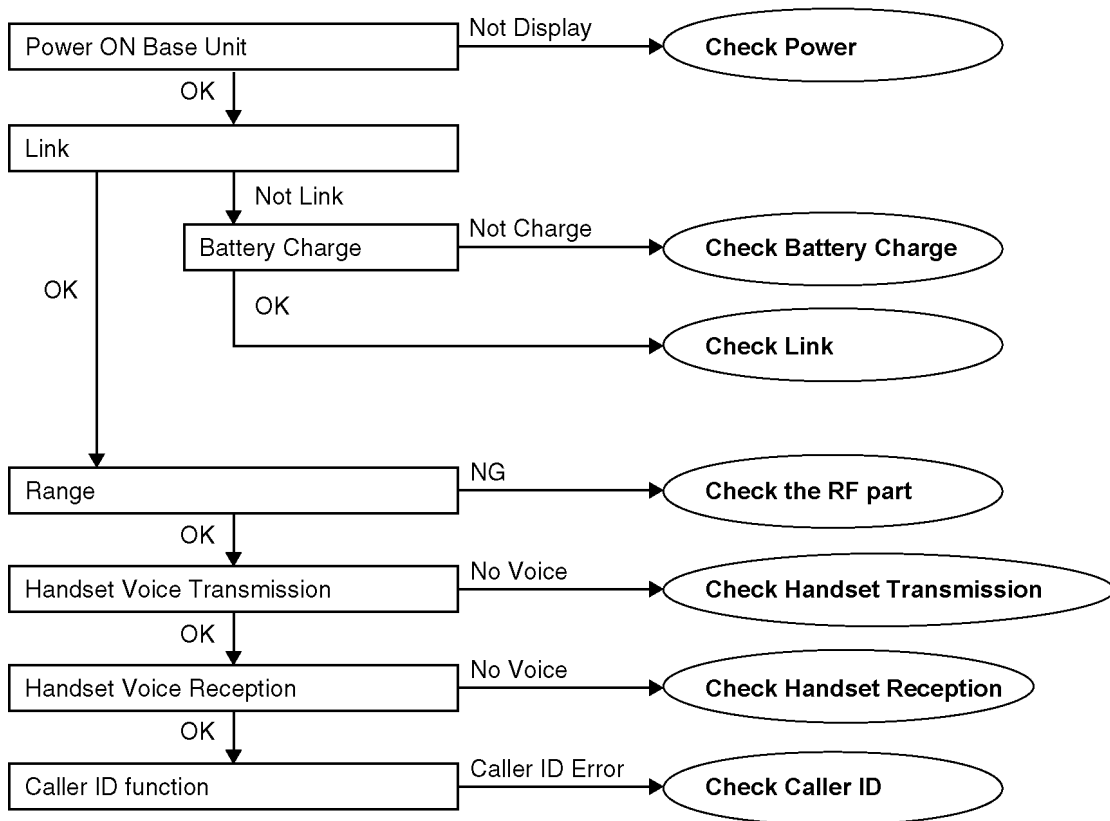
NG

(Horizontal interval tolerance is more than 0.2mm.)



7 TROUBLESHOOTING GUIDE

FLOW CHART



Cross Reference:

Check Power (P.20)

Check Battery Charge (P.21)

Check Link (P.22)

Check the RF part (P.23)

Check Handset Transmission (P.29)

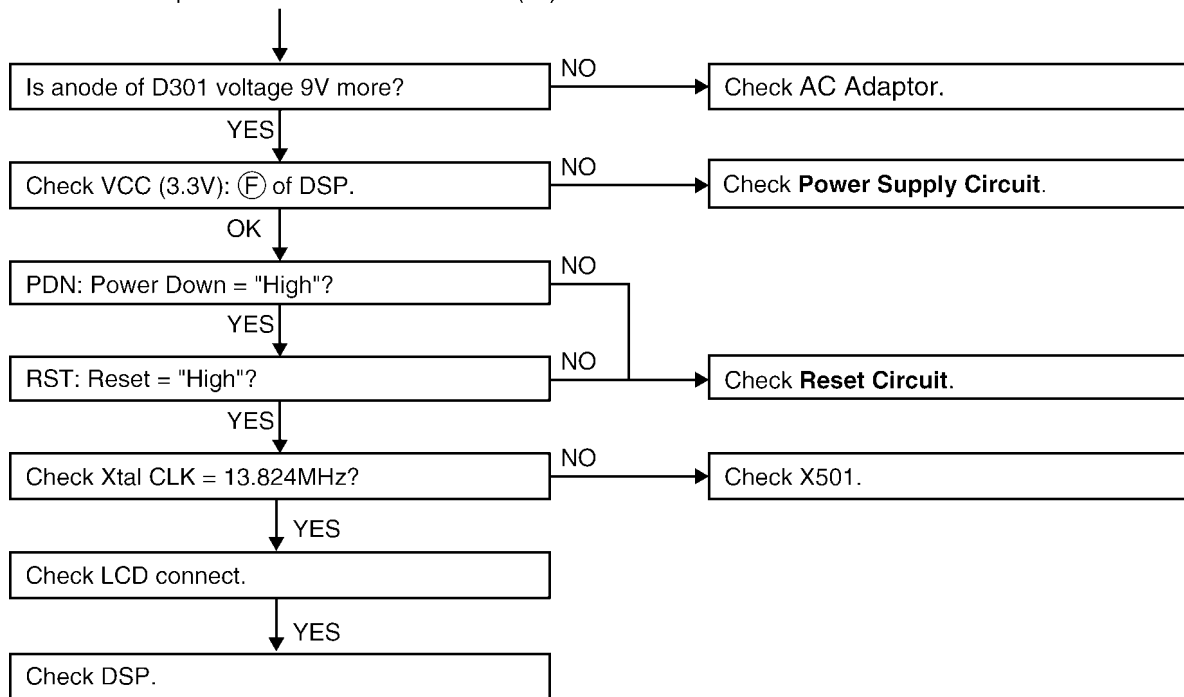
Check Handset Reception (P.29)

Check Caller ID (P.29)

7.1. Check Power

BASE UNIT

Is the AC Adaptor inserted into AC outlet? (*1)



Cross Reference:

Power Supply Circuit (P.50)

Reset Circuit (P.52)

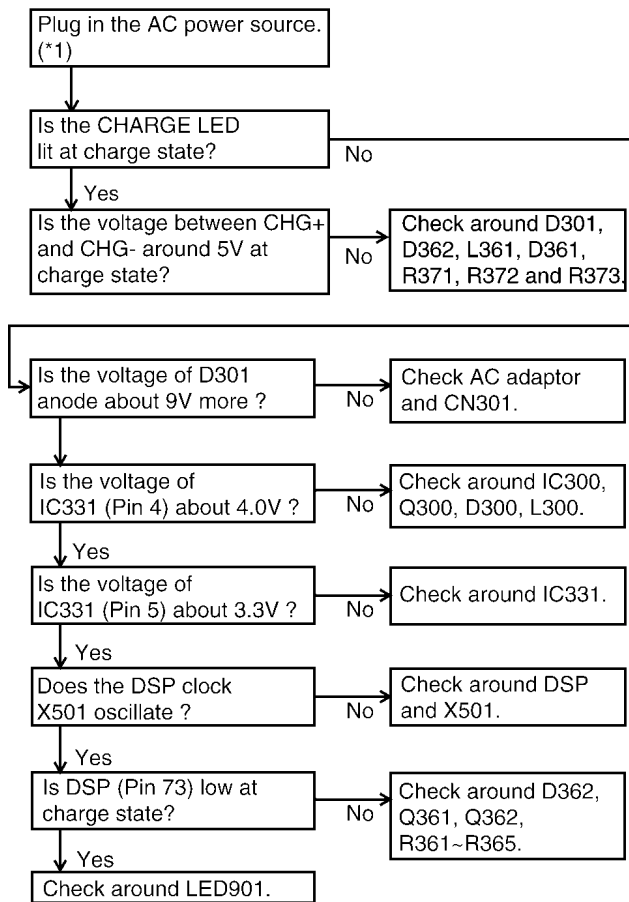
Note:

DSP is IC501.

(*1) Refer to "**SPECIFICATIONS**" on cover page for part number and supply voltage of AC adaptor.

7.2. Check Battery Charge

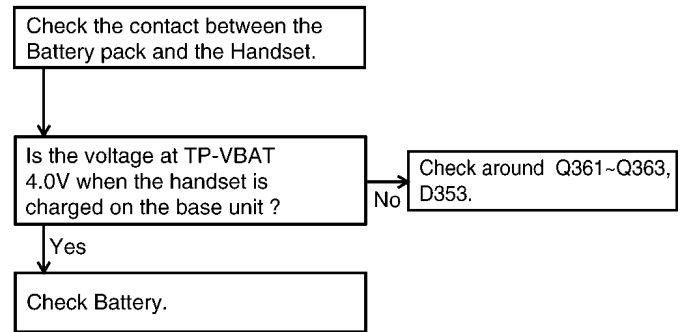
BASE UNIT



Note:

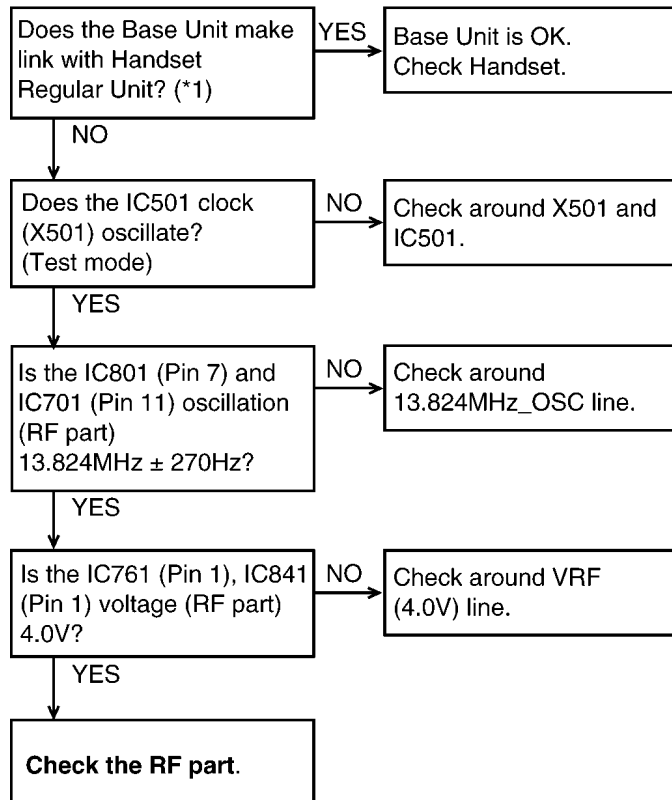
DSP is IC501.

HANDSET



7.3. Check Link

BASE UNIT

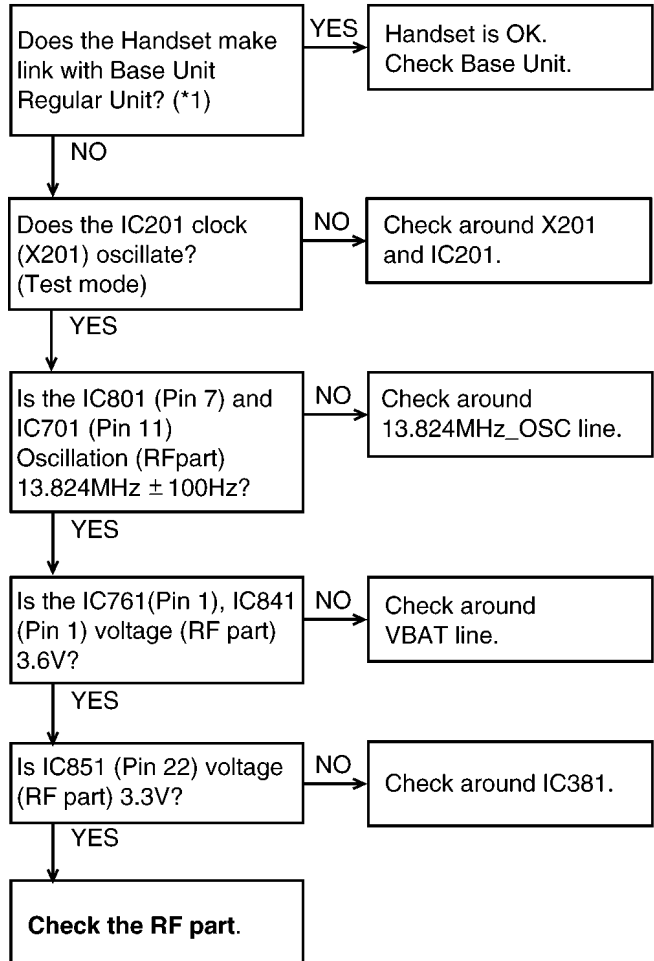


Note:

DSP is IC501.

(*1) Refer to **Finding out the Defective part** (P.23).

HANDSET



Cross Reference:

Check the RF part (P.23)

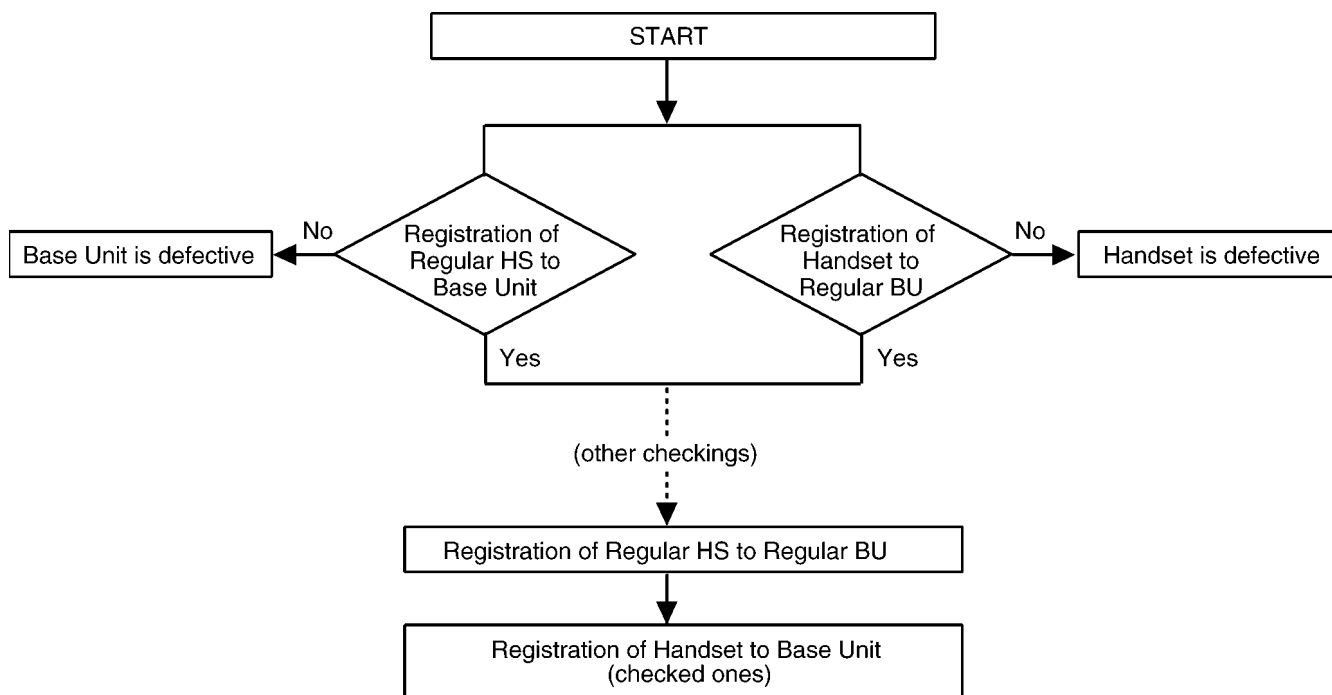
7.4. Check the RF part

7.4.1. Finding out the Defective part

1. Prepare Regular HS(*1) and Regular BU(*2).
2. a. Re-register regular HS (Normal mode) to Base Unit (to be checked).
If this operation fails in some ways, the Base Unit is defective.
- b. Re-register Handset (to be checked) to regular BU (Normal mode).
If this operation fails in some ways, the Handset is defective.

After All the Checkings or Repairing

1. Re-register the checked Handset to the checked Base Unit, and Regular HS to Regular BU.



Note:

- (*1) HS: Handset
(*2) BU: Base Unit

7.4.1.1. Re-registering a Handset

The included handset and base unit are preregistered. If for some reason the handset is not registered to the base unit, register the handset.

1 Handset:

[MENU] → [0][0]

2 Base unit:

Press and hold [HANDSET LOCATOR] until the CHARGE indicator flashes.

- After the CHARGE indicator starts flashing, the rest of the procedure must be completed within 1 minute.

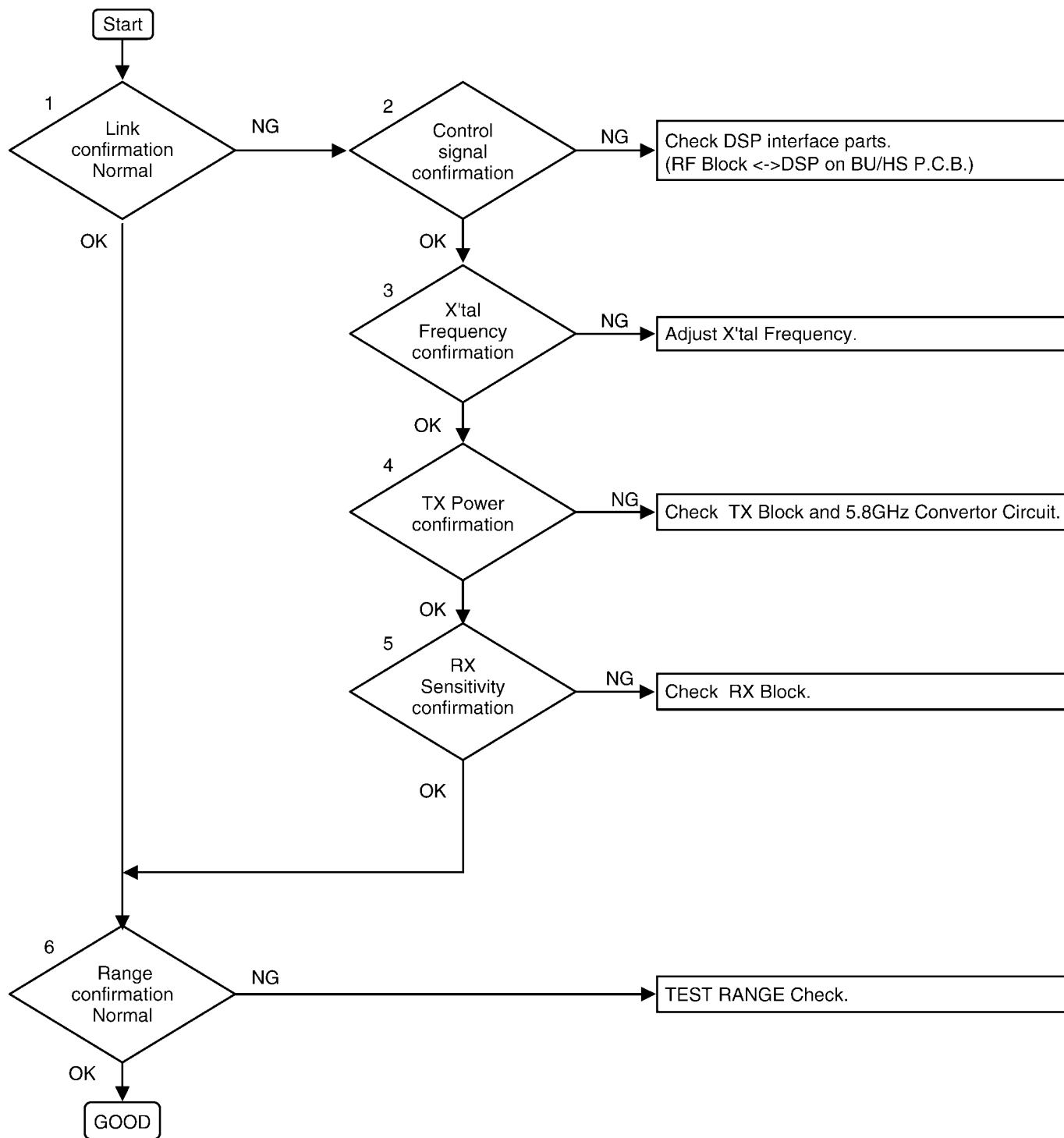
3 Handset:

Press [OK], then wait until the handset beeps.

7.4.2. RF Check Flowchart

Each item (1 ~ 6) of RF Check Flowchart corresponds to **Check Table for RF part** (P.25).

Please refer to the each item.



7.4.3. Check Table for RF part

No.	Item	BU (Base Unit) Check	HS (HandSet) Check
1	Link Confirmation Normal HS, BU Mode: [Normal Mode]	1. Register Regular HS to BU (to be checked). 2. Press [Talk] key of the Regular HS to establish link.	1. Register HS (to be checked) to Regular BU. 2. Press [Talk] key of the HS to establish link.
2	Control signal confirmation HS, BU Mode: [Test Burst Mode] (*1)	Check DSP interface. (*2)	Check DSP interface. (*2)
3	X'tal Frequency confirmation (*7) HS, BU Mode: [Adjustment] (*3)	Check X'tal Frequency. (13.824000MHz $\pm$ 270Hz)	Check X'tal Frequency. (13.824000MHz $\pm$ 100Hz)
4	TX Power confirmation Regular HS, BU Mode: [RX-CW Mode.] (*4) HS, BU (to be checked) Mode: [Test Burst Mode.] (*1)	1. Place the Regular HS about 15cm away from the BU. 2. Confirm that RSSI of the Regular HS is approximately 2V by Oscilloscope. (*5)	1. Place the HS about 15cm away from the Regular BU. 2. Confirm that RSSI of the Regular BU is approximately 2V by Oscilloscope. (*6)
5	RX Sensitivity confirmation Regular HS, BU Mode: [Test Burst Mode.] (*1) HS, BU (to be checked) Mode: [RX-CW Mode.] (*4)	1. Place the Regular HS about 15cm away from the BU. 2. Confirm that RSSI of the BU is approximately 2V by Oscilloscope. (*5)	1. Place the HS about 15cm away from the Regular BU. 2. Confirm that RSSI of the HS is approximately 2V by Oscilloscope. (*6)
6	Range Confirmation Normal HS, BU Mode: [Normal Mode]	1. Register Regular HS to BU (to be checked). 2. Press [Talk] key of the Regular HS to establish link. 3. Compare the range of the BU (being checked) with that of the Regular BU.	1. Register HS (to be checked) to Regular BU. 2. Press [Talk] key of the HS to establish link. 3. Compare the range of the HS (being checked) with that of the Regular HS.

Note:

(*1)(*3)(*4) **ADJUSTMENT AND TEST MODE** (P.30)

(*2) **RF-DSP Interface Signal Wave Form** (P.27)

(*5) **Base Unit Reference Drawing** (P.39)

(*6) **Handset Reference Drawing** (P.40)

(*7) **X501 (Base Unit), X201 (Handset) Check** (P.38)

7.4.4. TEST RANGE Check

Circuit block which range is defective can be found by the following check.

Item	BU (Base Unit) Check	HS (HandSet) Check
Range Confirmation TX TEST (TX Power check) HS, BU Mode: [Test Link Mode] (*1)	1. Register Regular HS to BU (to be checked). 2. Set BU to "Test Link mode". 3. Set Regular HS to "Test Link mode". *Set TX Power and RX Sensitivity of the BU and the Regular HS by CHART1. * At distance of about 20m between HS and BU, Link OK = TX Power of the BU is OK. No Link = TX Power of the BU is NG.	1. Register HS (to be checked) to Regular BU. 2. Set Regular BU to "Test Link mode". 3. Set HS to "Test Link mode". *Set TX Power and RX Sensitivity of the HS and the Regular BU by CHART1. * At distance of about 20m between HS and BU, Link OK = TX Power of the HS is OK. No Link = TX Power of the HS is NG.
Range Confirmation RX TEST (RX sensitivity check) HS, BU Mode: [Test Link Mode] (*1)	1. Register Regular HS to BU (to be checked). 2. Set BU to "Test Link mode". 3. Set Regular HS to "Test Link mode". *Set TX Power and RX Sensitivity of the BU and Regular HS by CHART1. * At distance of about 20m between HS and BU, Link OK= RX Sensitivity of the BU is OK. No Link = RX Sensitivity of the BU is NG.	1. Register HS (to be checked) to Regular BU. 2. Set Regular BU to "Test Link mode". 3. Set HS to "Test Link mode". * Set TX Power and RX Sensitivity of Checking_HS and Regular_BU by CHART1. * At distance of about 20m between HS and BU, Link OK= RX Sensitivity of the HS is OK. No Link = RX Sensitivity of the HS is NG.

CHART1: Setting of TX Power and RX Sensitivity in Range Confirmation TX TEST, RX TEST

	BU (to be checked)		Regular_HS	
	TX Power	RX Sens.	TX Power	RX Sens.
BU (Base Unit) TX Power Check	High	High	High	Low
BU (Base Unit) RX Sensitivity Check	High	High	Low	High

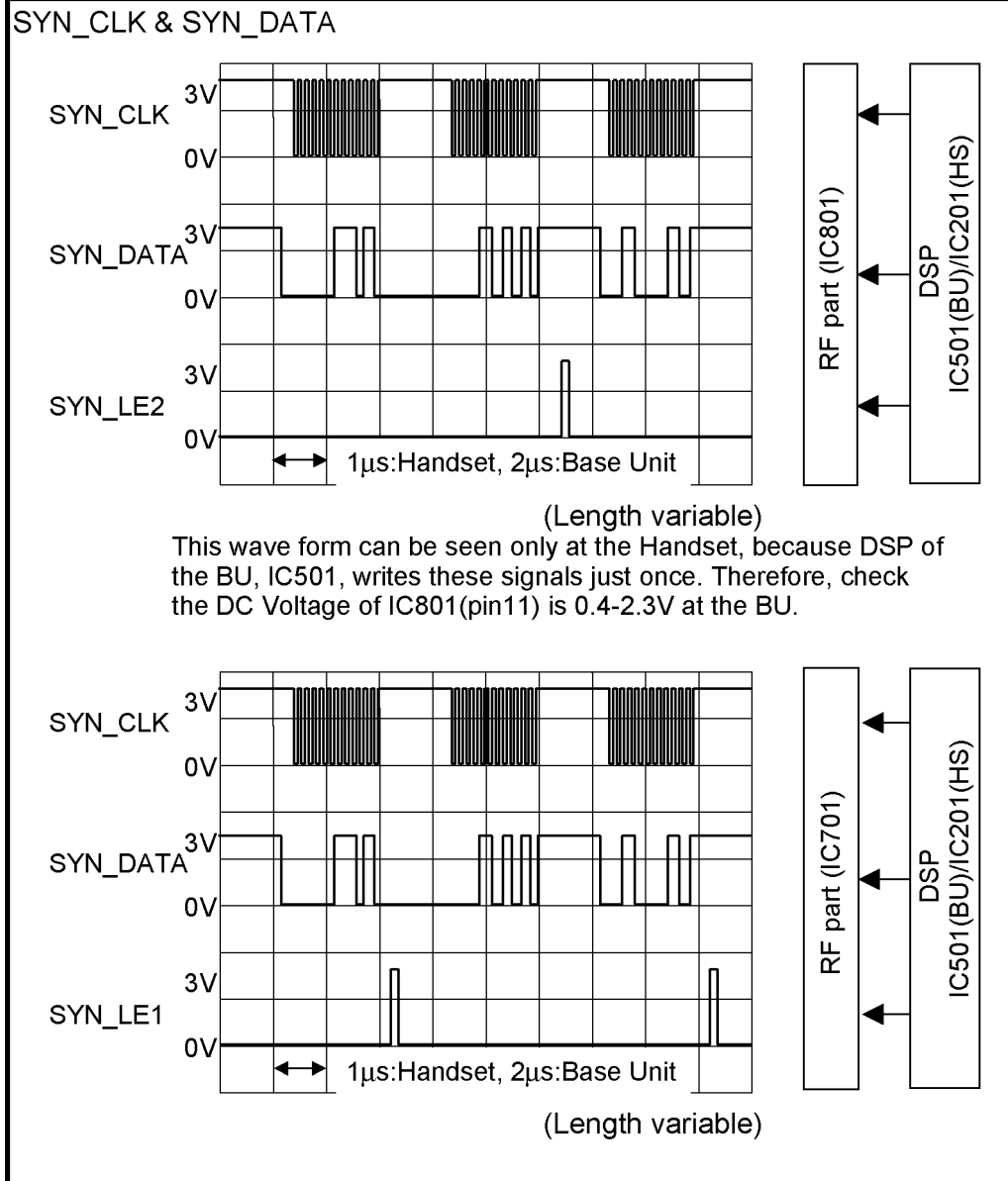
	HS (to be checked)		Regular_BU	
	TX Power	RX Sens.	TX Power	RX Sens.
HS (Handset) TX Power Check	High	High	High	Low
HS (Handset) RX Sensitivity Check	High	High	Low	High

Note:

(*1) **ADJUSTMENT AND TEST MODE** (P.30)

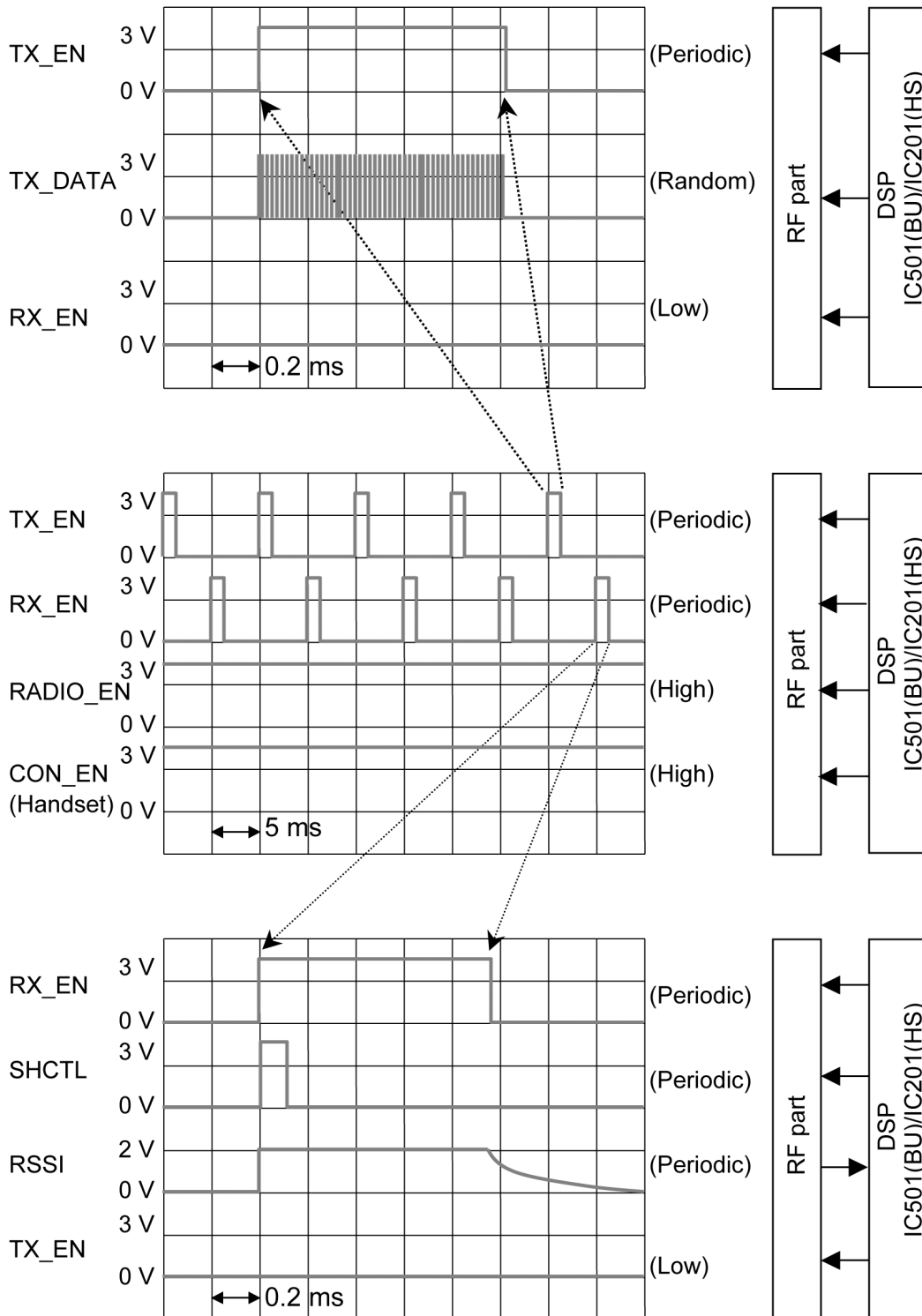
7.4.5. RF-DSP Interface Signal Wave Form

<Test Burst Mode>

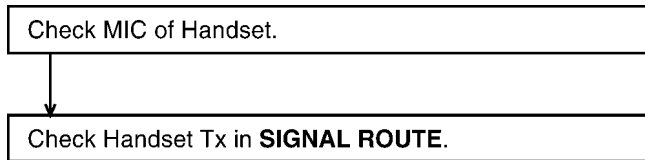


<Test Burst Mode>

TX & RX



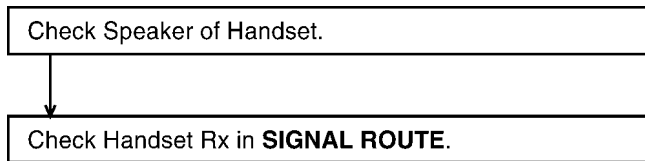
7.5. Check Handset Transmission



Cross Reference:

SIGNAL ROUTE (P.68).

7.6. Check Handset Reception



Cross Reference:

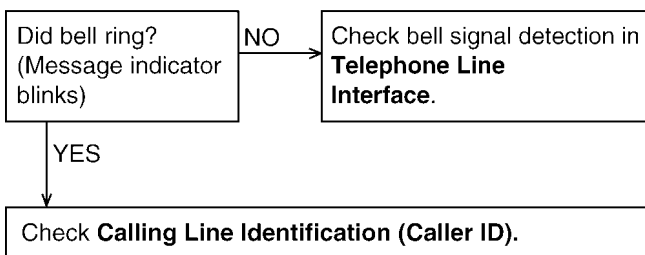
SIGNAL ROUTE (P.68).

Note:

When checking the RF part, Refer to **Check the RF part** (P.23)

7.7. Check Caller ID

BASE UNIT



Cross Reference:

Telephone Line Interface (P.53).

Calling Line Identification (Caller ID) (P.55).

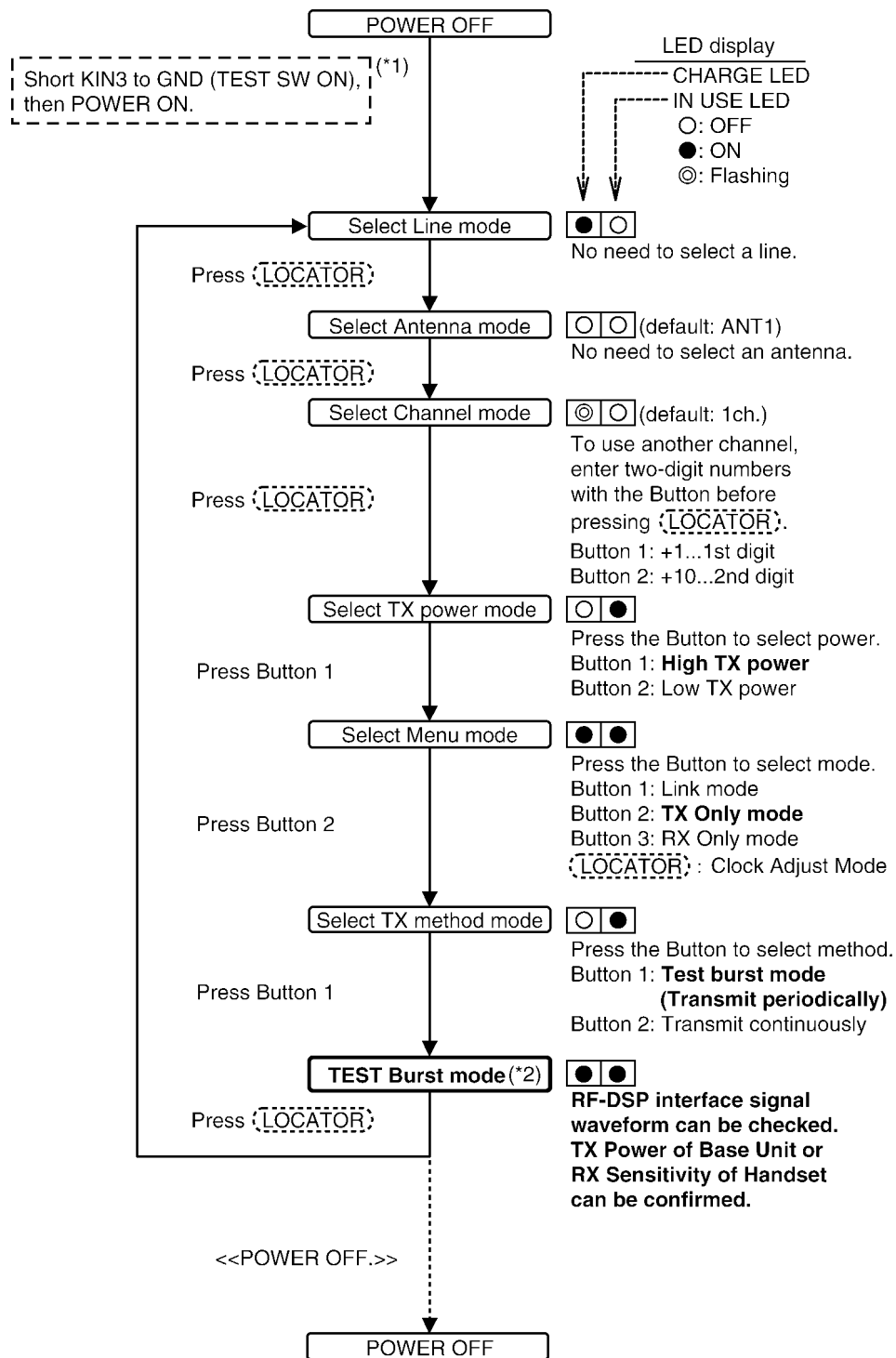
Note:

- Make sure the format of the Caller ID service of the Telephone company that the customer subscribed to.
- Also we recommend to confirm that the customer is really a subscriber of the service.

8 ADJUSTMENT AND TEST MODE

8.1. Test Mode Flow Chart for Base Unit

8.1.1. Test Burst Mode

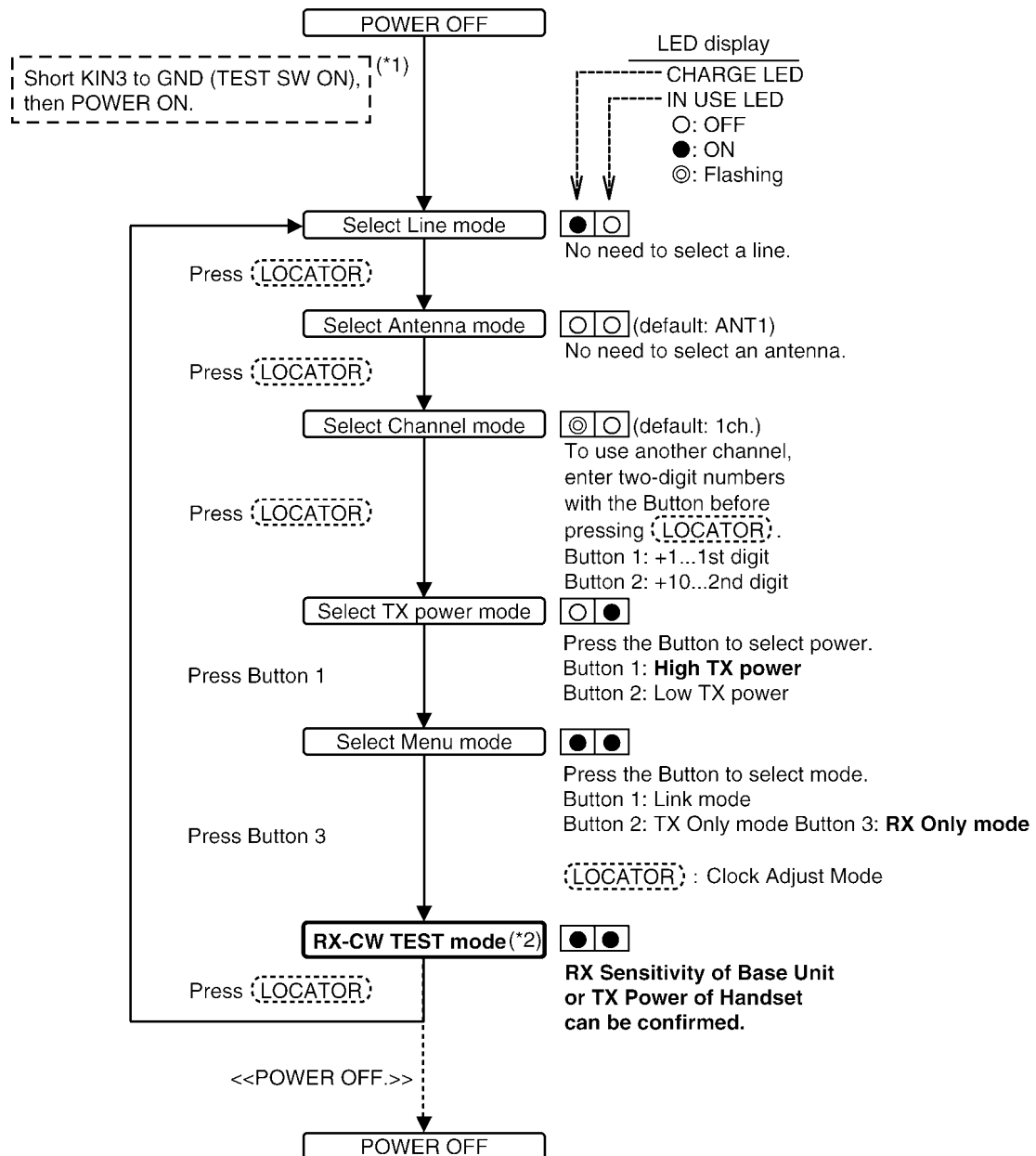


Note:

(*) When you check test mode, connect to the external Buttons because Base Unit has only LOCATOR key. To short KIN3 to GND, refer to a method of connection of TEST_SW in "For Test Mode" in **Base Unit Reference Drawing** (P.39). -Insert AC adaptor during checking.

(*) Refer to **Check Table for RF part** (P.25) and **RX-CW Test Mode** (P.35) for proper Handset settings.

8.1.2. RX-CW TEST Mode

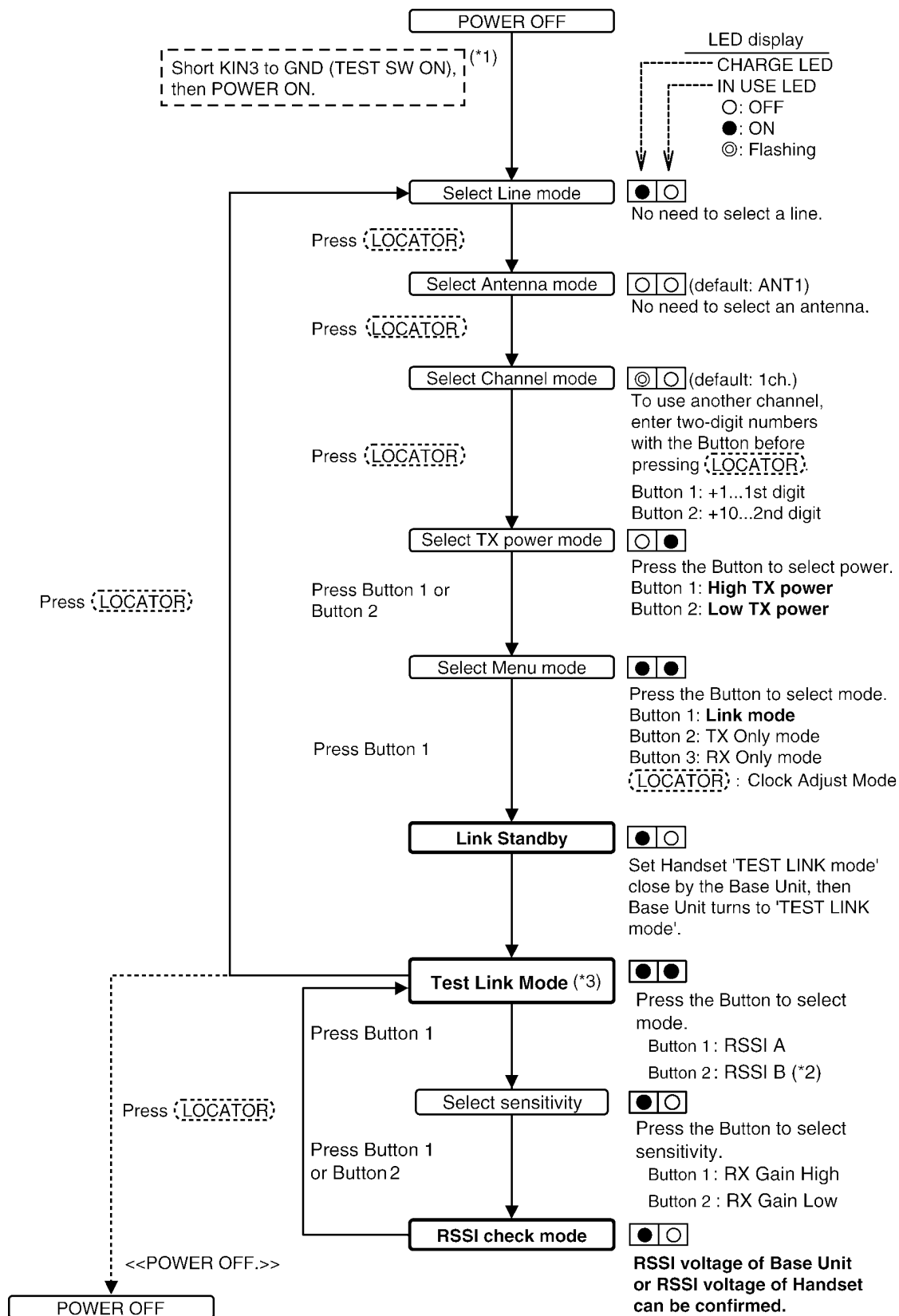


Note:

(*1) When you check test mode, connect to the external Buttons because Base Unit has only LOCATOR key. To short KIN3 to GND, refer to a method of connection of TEST_SW in "For Test Mode" in **Base Unit Reference Drawing** (P.39). -Insert AC adaptor during checking.

(*2) Refer to **Check Table for RF part** (P.25) and **Test Burst Mode** (P.34) for proper Handset settings.

8.1.3. Test Link Mode



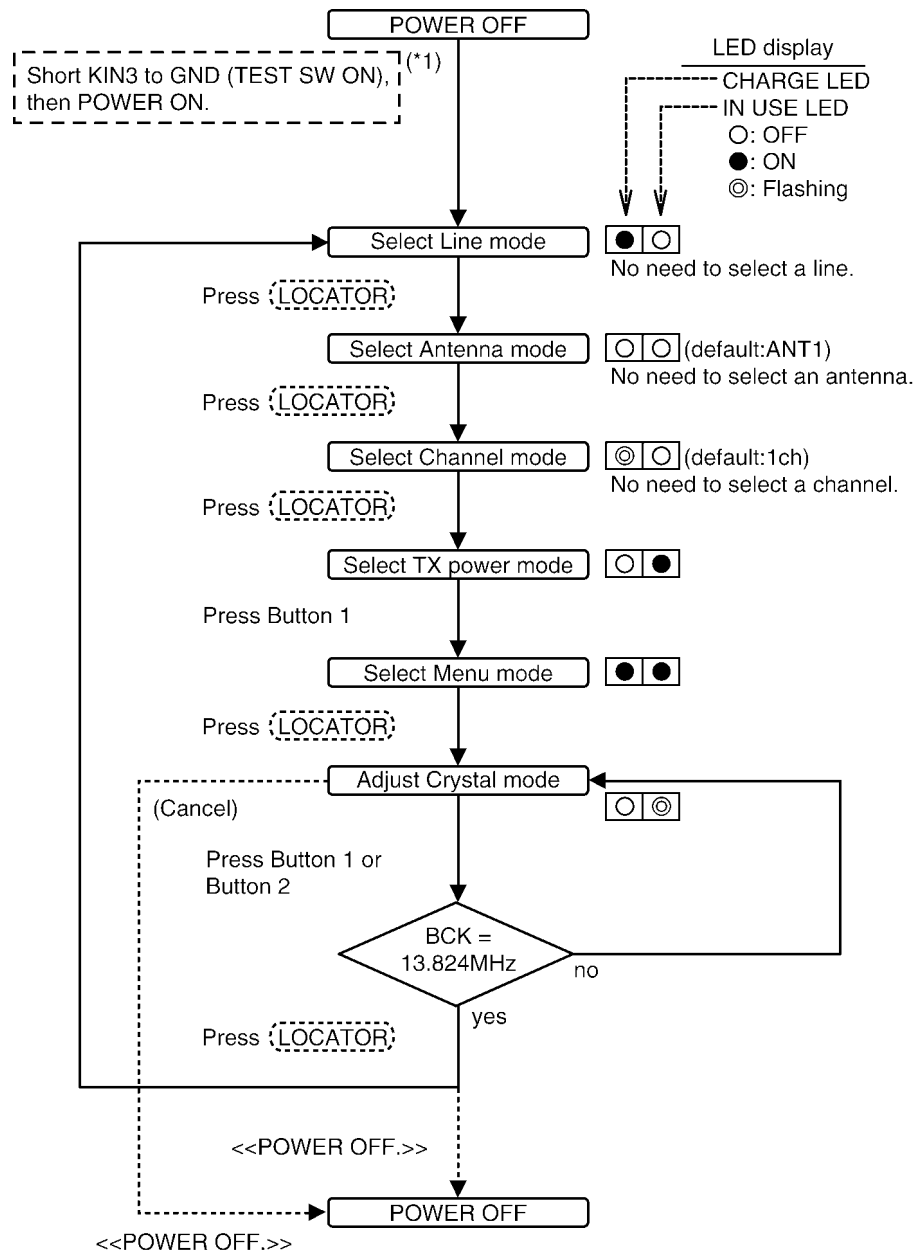
Note:

(*1) When you check test mode, connect to the external Buttons because Base Unit has only LOCATOR key. To short KIN3 to GND, refer to a method of connection of TEST_SW in "For Test Mode" in **Base Unit Reference Drawing** (P.39). -Insert AC adaptor during checking.

(*2) for factory use only

(*3) Refer to **Check Table for RF part** (P.25) and **Test Link Mode** (P.36) for proper Handset settings.

8.1.4. Adjustment Mode



Cross Reference

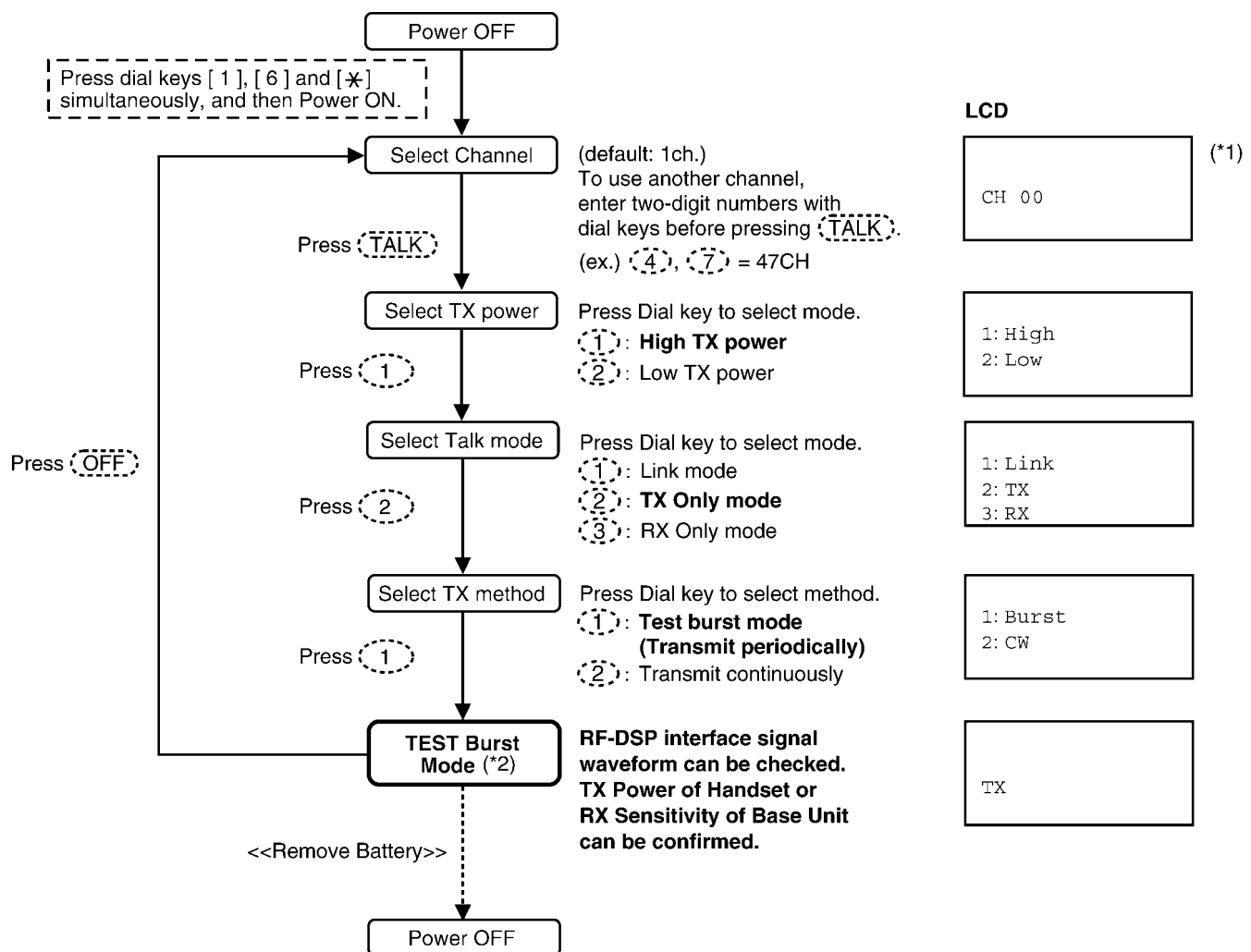
Check and Adjust X501 (Base Unit) Frequency (P.38)

Note:

(*1) When you check test mode, connect to the external Buttons because Base Unit has only LOCATOR key. To short KIN3 to GND, refer to a method of connection of TEST_SW in “For Test Mode” in **Base Unit Reference Drawing** (P.39). -Insert AC adaptor during checking.

8.2. Test Mode Flow Chart for Handset

8.2.1. Test Burst Mode



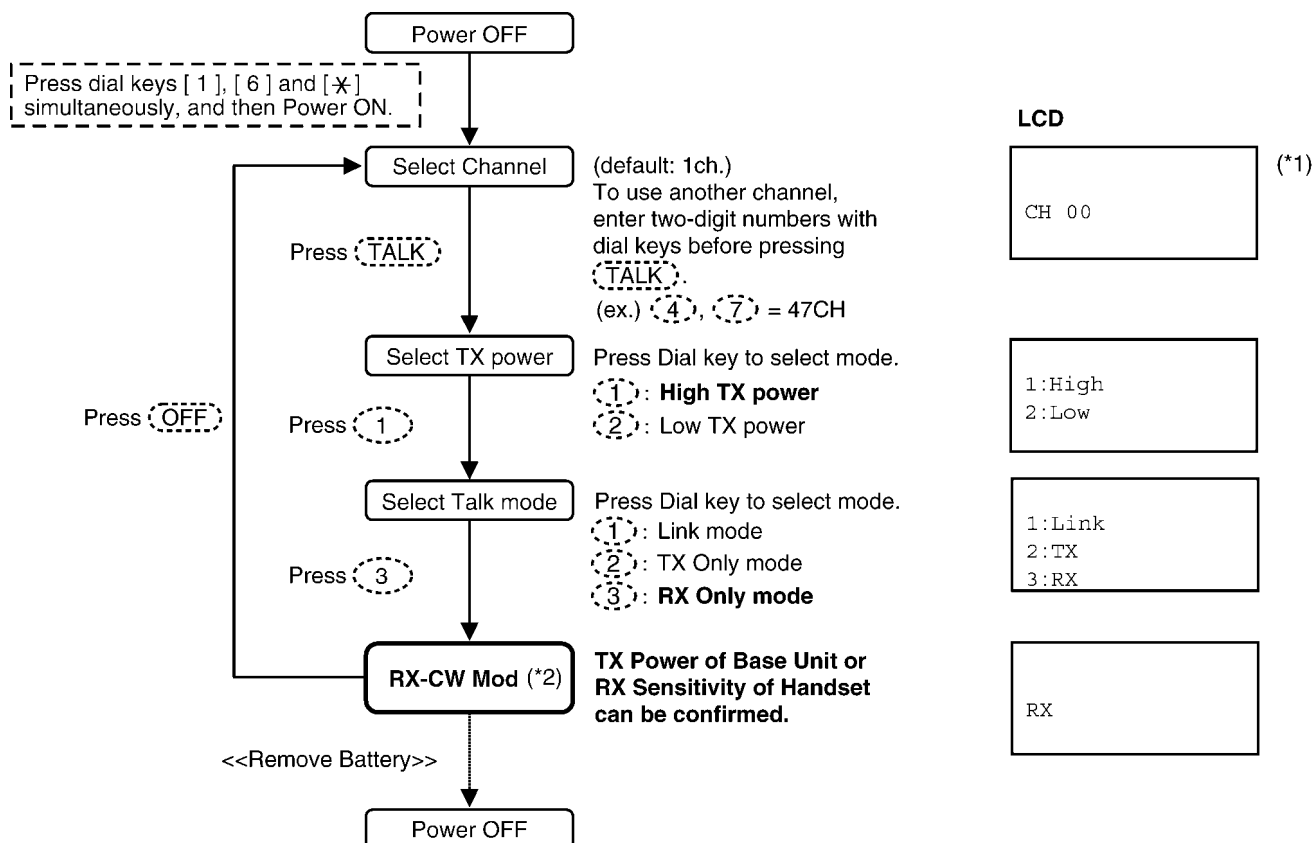
Note:

(*) LCD displays the Channel number.

(exception: default/ CH00 = 1ch.)

(*) Refer to **Check Table for RF part** (P.25) and **RX-CW TEST Mode** (P.31) for proper Base Unit settings.

8.2.2. RX-CW Test Mode



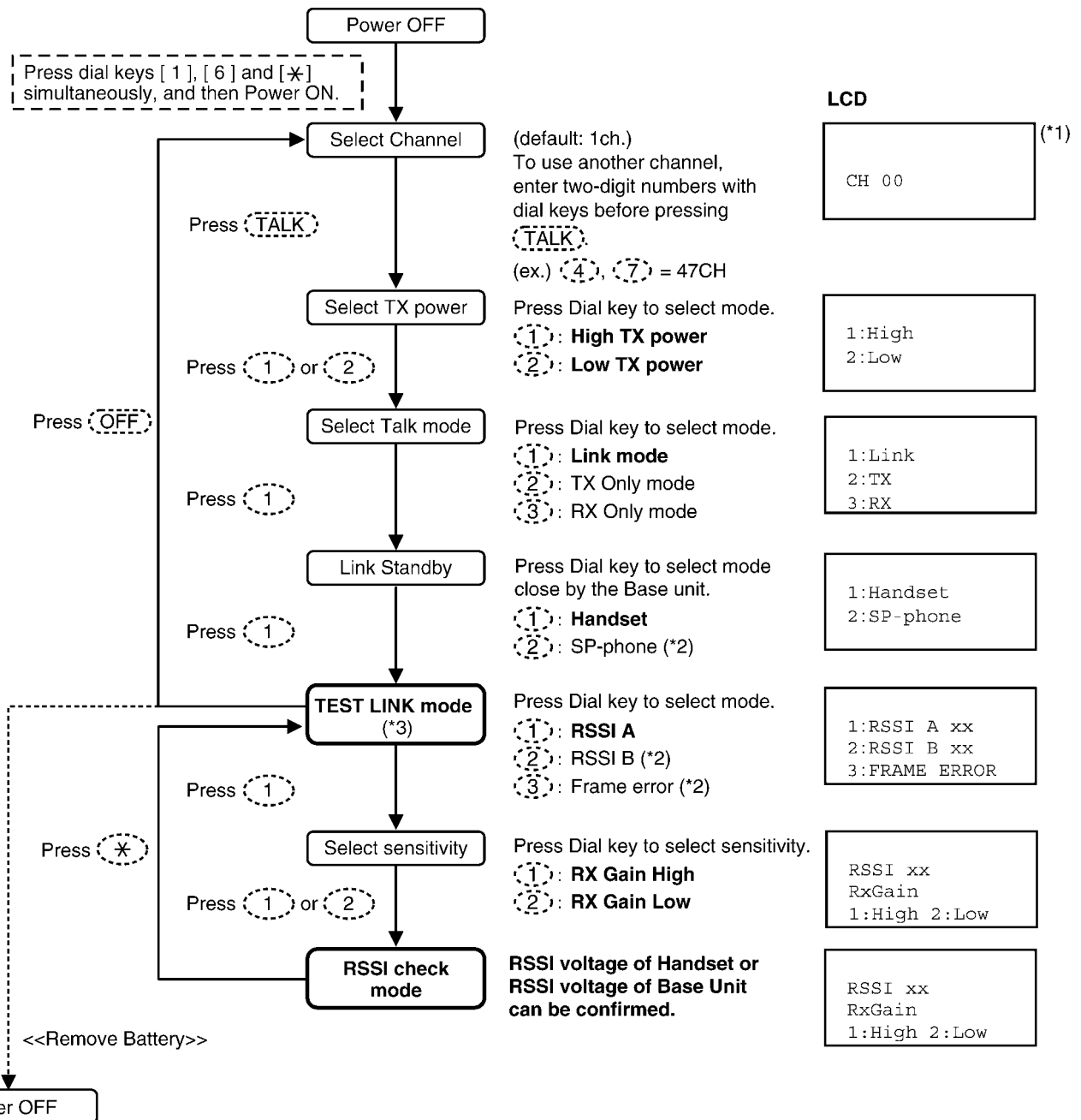
Note:

(*1) LCD displays the Channel number.

(exception: default/ CH00 = 1ch.)

(*2) Refer to **Check Table for RF part** (P.25) and **Test Burst Mode** (P.30) for proper Base Unit settings.

8.2.3. Test Link Mode



Note:

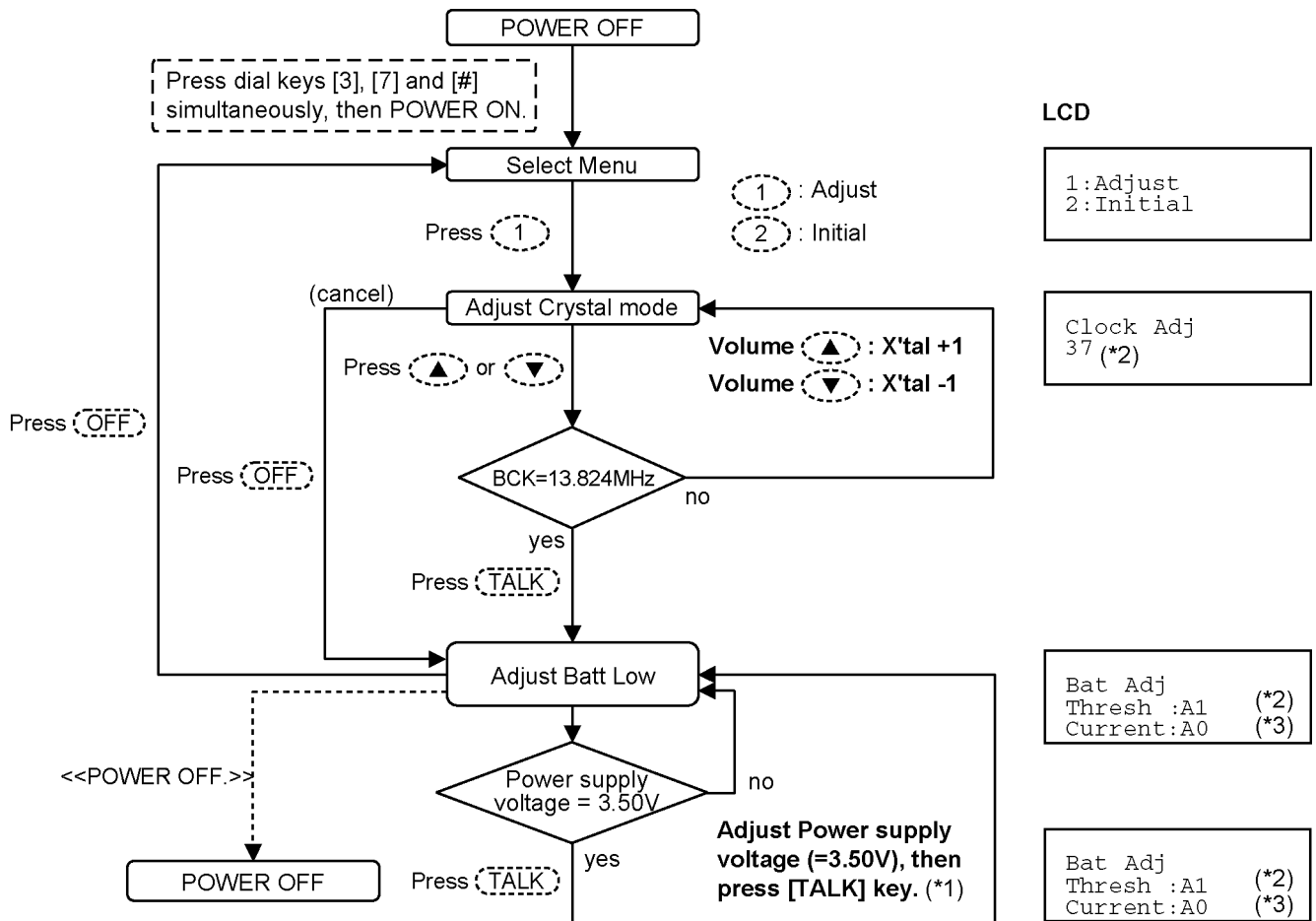
(*1) LCD displays the Channel number.

(exception: default/ CH00 = 1ch.)

(*2) for factory use only.

(*3) Refer to **Check Table for RF part** (P.25) and **Test Link Mode** (P.32) for proper Base Unit settings.

8.2.4. Adjustment Mode



Cross Reference

(*1) **Adjust Battery Low Detector Voltage (Handset)** (P.38)

Note:

(*2) These are the default values.

(*3) These values may not be fixed depending on the battery strength.

8.3. X501 (Base Unit), X201 (Handset) Check

Equipment: Frequency counter

Check Point for measurement: BCK

Checking tolerance: 13.824MHz $\pm$ 270Hz (Base Unit)/13.824MHz $\pm$ 100Hz (Handset)

8.3.1. Check and Adjust X501 (Base Unit) Frequency

1. Set up Base Unit in TEST mode.
2. Press following keys in order to Adjust Crystal mode. [LOCATOR], [LOCATOR], [LOCATOR] , [Button 1] (*1), [LOCATOR].
Check BCK frequency.
3. If the BCK frequency is out of the checking tolerance ($\pm$ 270Hz), adjust to Adjustment tolerance ($\pm$ 30Hz) by pressing [BUTTON 1] (*1) or [BUTTON 2] (*1) key.
Adjustment Tolerance: 13.824MHz $\pm$ 30Hz
4. Press [LOCATOR] key to write the new frequency factor in Memory.
5. Turn the power off. Then this value is available.

When you have replaced IC501 and IC611, adjust X501 by the procedure above.

Note:

(*1) When you check test mode, connect to the external Buttons because Base Unit has only LOCATOR key. Refer to "For Test Mode" in **Base Unit Reference Drawing** (P.39). -Insert AC adaptor during checking.

Cross Reference:

Adjustment Mode (P.33)

8.3.2. Check and Adjust X201 (Handset) Frequency

1. Set DC power supply to 3.9V.
2. Set up Handset in TEST mode (Adjustment flow).
3. Press [1] key to Adjust Crystal mode. ("Clock Adj." is displayed on LCD). Check BCK frequency.
4. If the BCK frequency is out of the checking tolerance ($\pm$ 100Hz), adjust to Adjustment tolerance ($\pm$ 30Hz) by pressing [$\blacktriangle$] or [$\blacktriangledown$] key.
Adjustment Tolerance: 13.824MHz $\pm$ 30Hz
5. Press [TALK] key to write the new frequency factor in EEPROM.
6. Turn the power off. Then this value is available.

When you have replaced IC201 and IC241, adjust X201 by the procedure above.

Cross Reference:

Adjustment Mode (P.37)

8.4. Adjust Battery Low Detector Voltage (Handset)

After Handset's DSP (IC201) or EEPROM (IC241) replacement, Re-writing Battery Low voltage to EEPROM is required.

With following Handset Adjustment Flow, adjust DC power supply and DC voltmeter by the procedure below.

1. Set DC power supply to 3.9V.
2. Set up Handset in TEST mode (Adjustment flow).
3. Press [1] key and [OFF] key to Adjust Batt Low mode. ("Bat Adj." is displayed on LCD)
4. Change the voltage of the DC power supply to 3.50V accurately. Check the voltage at P.C. board pads because some voltage drops occur due to the usage of long or thin cables.
5. Press [TALK] key to write voltage value in EEPROM.
6. Turn the power off. Then this value is available.

Note:

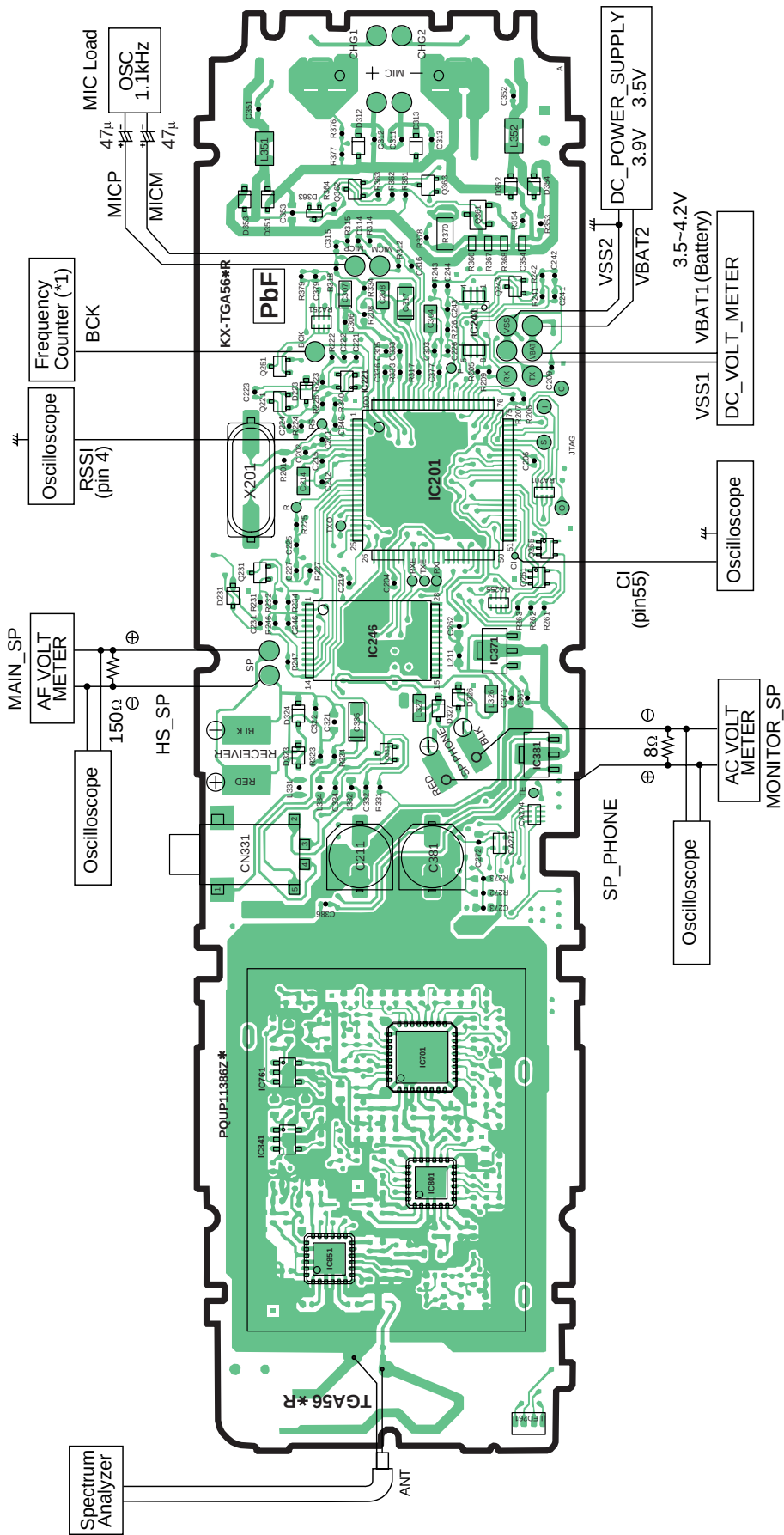
Refer to **Handset Reference Drawing** (P.40) for connection of DC power supply and voltmeter.

Cross Reference:

Adjustment Mode (P.37)

8.6. Handset Reference Drawing

When connecting the Simulator and Equipment for checking, please refer to below.



Note: (*1) is referred to No.3 of Check Table for RF part (P.25)

8.7. Frequency Table

8.7.1. Base Unit

Channel	TX/RX Frequency (MHz)	Channel	TX/RX Frequency (MHz)	Channel	TX/RX Frequency (MHz)
1	5759.702398	33	5788.242242	65	5816.782086
2	5760.592291	34	5789.132135	66	5817.671978
3	5761.486139	35	5790.025982	67	5818.565826
4	5762.376031	36	5790.915875	68	5819.455719
5	5763.269879	37	5791.809723	69	5820.349566
6	5764.159771	38	5792.699615	70	5821.239459
7	5765.053619	39	5793.593463	71	5822.133307
8	5765.943512	40	5794.483355	72	5823.023199
9	5766.837359	41	5795.377203	73	5823.917047
10	5767.727252	42	5796.267096	74	5824.806939
11	5768.621100	43	5797.160943	75	5825.700787
12	5769.510992	44	5798.050836	76	5826.590680
13	5770.404840	45	5798.944684	77	5827.484527
14	5771.294732	46	5799.834576	78	5828.374420
15	5772.188580	47	5800.728424	79	5829.268268
16	5773.078473	48	5801.618316	80	5830.158160
17	5773.972320	49	5802.512164	81	5831.052008
18	5774.862213	50	5803.402057	82	5831.941900
19	5775.756060	51	5804.295904	83	5832.835748
20	5776.645953	52	5805.185797	84	5833.725641
21	5777.539801	53	5806.079644	85	5834.619488
22	5778.429693	54	5806.969537	86	5835.509381
23	5779.323541	55	5807.863385	87	5836.403228
24	5780.213434	56	5808.753277	88	5837.293121
25	5781.107281	57	5809.647125	89	5838.186969
26	5781.997174	58	5810.537018		
27	5782.891021	59	5811.430865		
28	5783.780914	60	5812.320758		
29	5784.674762	61	5813.214605		
30	5785.564654	62	5814.104498		
31	5786.458502	63	5814.998346		
32	5787.348394	64	5815.888238		

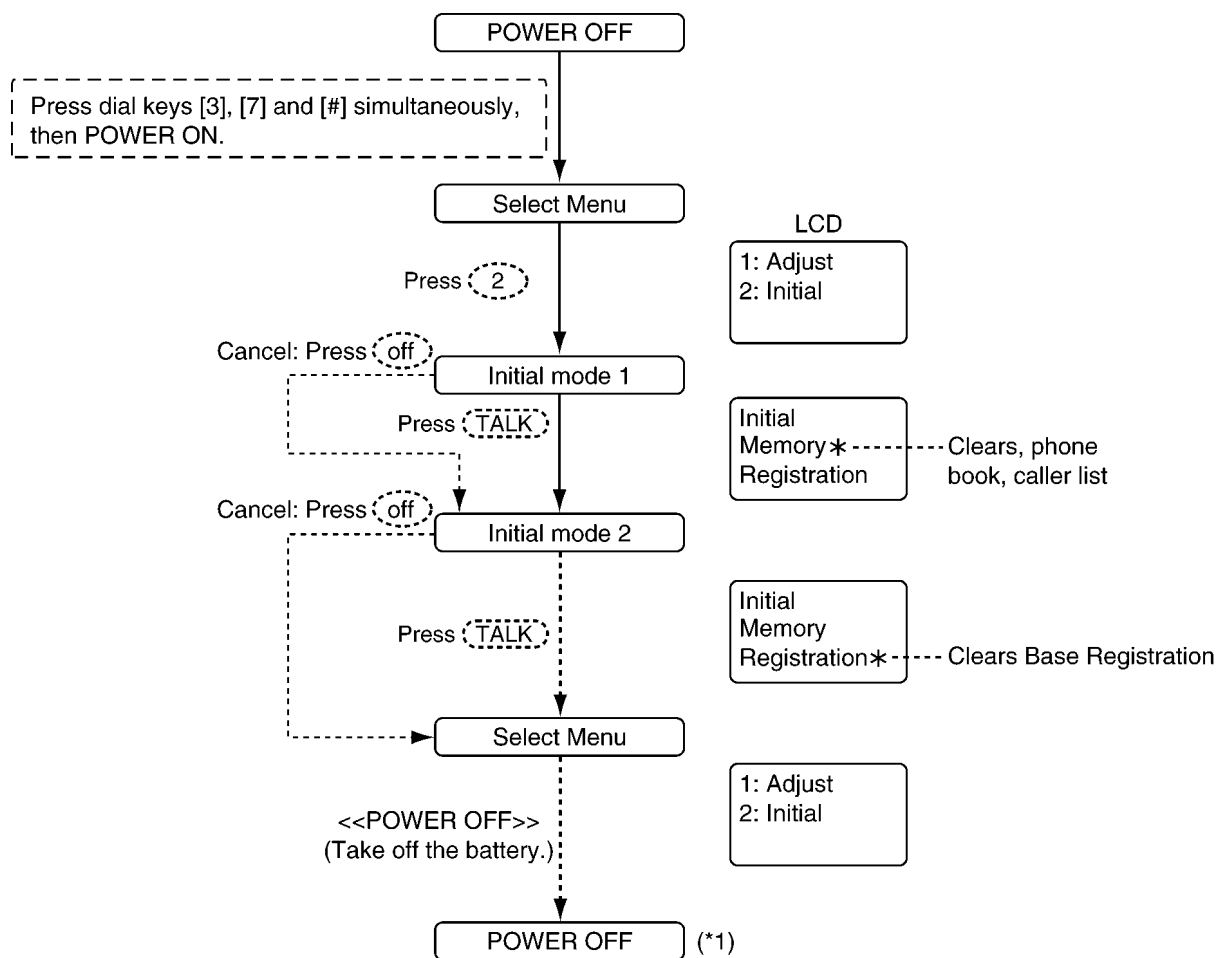
8.7.2. Handset

Channel	TX/RX Frequency (MHz)	Channel	TX/RX Frequency (MHz)	Channel	TX/RX Frequency (MHz)
1	5759.700425	33	5788.240269	65	5816.780113
2	5760.594273	34	5789.134117	66	5817.673960
3	5761.484165	35	5790.024009	67	5818.563853
4	5762.378013	36	5790.917857	68	5819.457701
5	5763.267906	37	5791.807749	69	5820.347593
6	5764.161753	38	5792.701597	70	5821.241441
7	5765.051646	39	5793.591490	71	5822.131333
8	5765.945494	40	5794.485337	72	5823.025181
9	5766.835386	41	5795.375230	73	5823.915074
10	5767.729234	42	5796.269078	74	5824.808921
11	5768.619126	43	5797.158970	75	5825.698814
12	5769.512974	44	5798.052818	76	5826.592662
13	5770.402867	45	5798.942710	77	5827.482554
14	5771.296714	46	5799.836558	78	5828.376402
15	5772.186607	47	5800.726451	79	5829.266294
16	5773.080455	48	5801.620298	80	5830.160142
17	5773.970347	49	5802.510191	81	5831.050035
18	5774.864195	50	5803.404039	82	5831.943882
19	5775.754087	51	5804.293931	83	5832.833775
20	5776.647935	52	5805.187779	84	5833.727623
21	5777.537828	53	5806.077671	85	5834.617515
22	5778.431675	54	5806.971519	86	5835.511363
23	5779.321568	55	5807.861412	87	5836.401255
24	5780.215415	56	5808.755259	88	5837.295103
25	5781.105308	57	5809.645152	89	5838.184996
26	5781.999156	58	5810.538999		
27	5782.889048	59	5811.428892		
28	5783.782896	60	5812.322740		
29	5784.672789	61	5813.212632		
30	5785.566636	62	5814.106480		
31	5786.456529	63	5814.996373		
32	5787.350376	64	5815.890220		

8.8. How to Clear User Setting (Handset Only)

Units are reset to the Factory settings by this operation (Erase stored Phone numbers, Caller list and etc.).

This operation should not be performed for a usual repair.



Note:

(*1) Be sure to short the battery terminals of the Handset with a lead wire, etc. for 2 seconds for discharge after removing the battery.

9 DESCRIPTION

9.1. Frequency

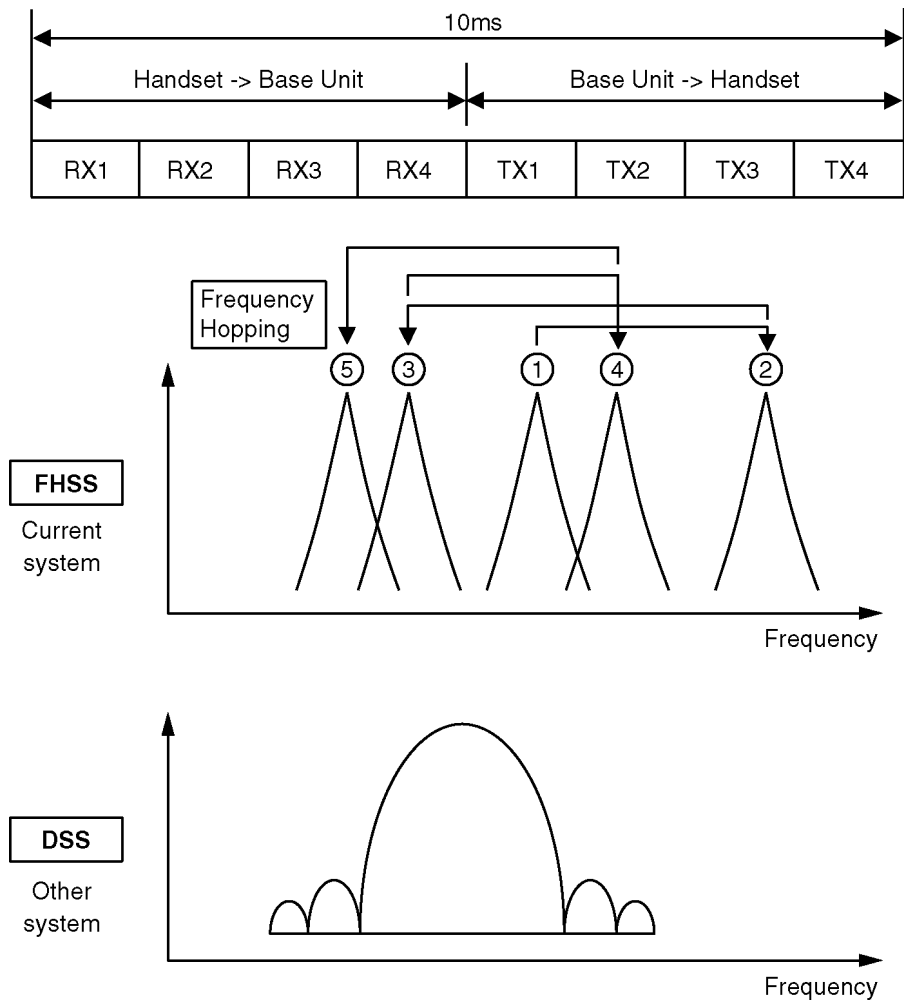
The frequency range of 5.76GHz-5.84GHz is used. Transmitting and receiving channel between Base Unit and Handset is same frequency. Refer to **Frequency Table** (P.41).

9.2. FHSS (Frequency Hopping Spread Spectrum)

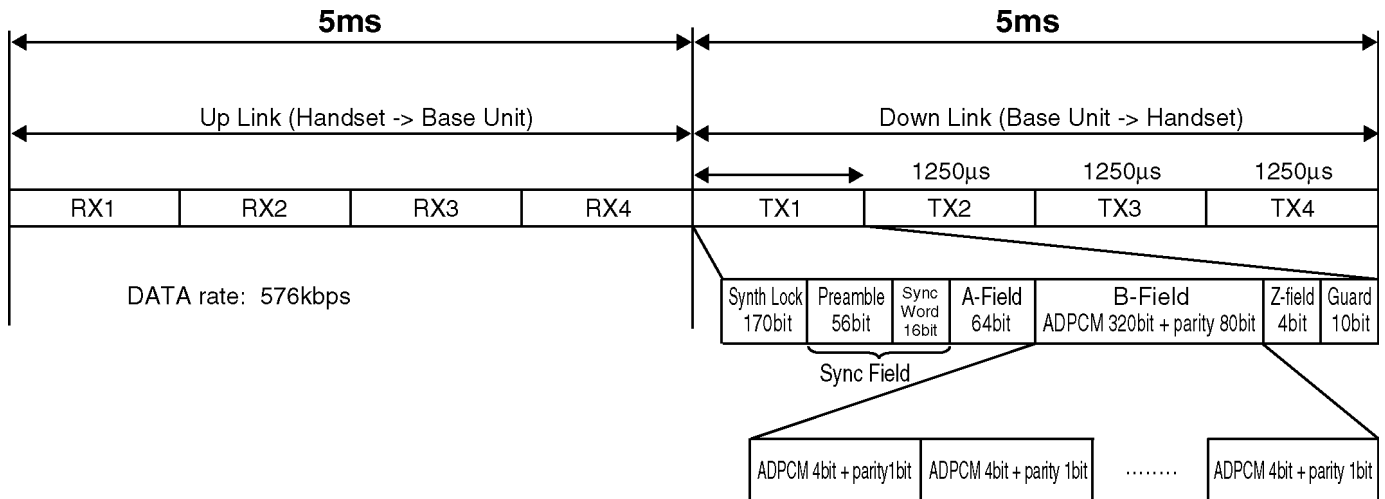
This telephone is using an IC chip which has similar specification to WDCT (World Digital Cordless Telephone) and is the telephone system that can use multiple portable unit simultaneously. The explanation of this system is mentioned below. This system uses a Time Division Multiple Access/Time Division Duplex (**TDMA/TDD**) scheme:

transmitting and receiving frequencies of the Base Unit and Handset are shared in the same frequency. The construction of RX/TX frequency data is shown below. It consists of 4 slots from the Base Unit to the Handset, and 4 slots from the Handset to the Base Unit, total 8 slots in 10ms. By this slot system, simultaneous air link and communication between 4 Handsets and the Base Unit can be realized. One communication between Handset and the Base Unit is done by one slot from the Base Unit to Handset, and another slot from Handset to the Base Unit.

DSS makes spectrum spread by multiplying carrier signal by PN code. The purpose to make spectrum spread is to reduce power density per time and per band. On the other hand, **FHSS** makes spectrum spread by changing channel every 10ms according to Hopping table. Also the purpose to make spectrum spread is to reduce power density per time and per band.



9.2.1. TDD Frame Format



Sync Field (72bit): Preamble 56bit + SyncWord 16bit

Base Unit (Handset) adjusts the timing of reception so that reception of Base Unit (Handset) can correspond to transmission of Handset (Base Unit).

It is necessary for sync-field that Handset gets synchronization.

A - field (64bit): Each kinds of DATA: ch data, line condition, etc.

B - field (320bit + 80bit): Sound data + parity

Z - field (4bit): Parity Check

9.2.2. TDMA system

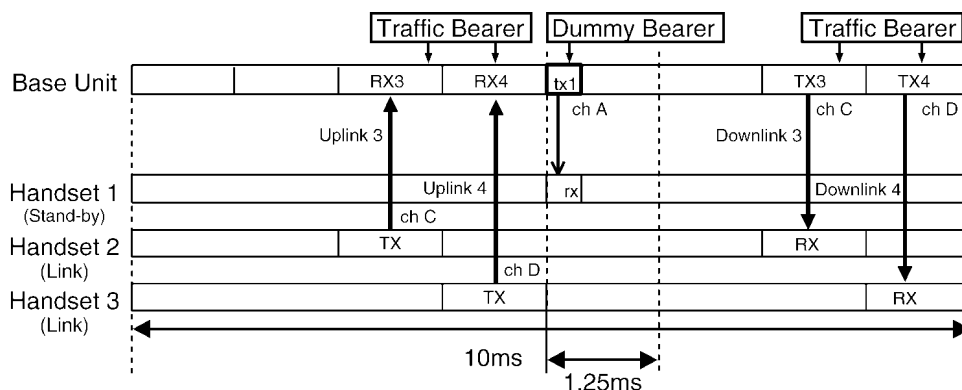
This system is the cycles of 10ms, and has four duplex paths, so it is possible to perform four duplex communications simultaneously.

In 1 slot 1.25ms, the 10ms of voice data is transmitted.

Each slot makes every frame frequency hop. (100hops/sec.)

Although each slot (UpLink3 and UpLink4) uses different frequency, UpLink3 and DownLink3 use the same frequency.

• 2 - Handsets Link



Traffic Bearer

A link is established between Base Unit and Handset.

The state where duplex communication is performed.

The hopping pattern of a 3000hops (30 seconds) cycle.

Dummy Bearer

The Base Unit sends Dummy-data to the all stand-by state Handsets.

The Handsets receive that data for keeping synchronization and monitoring request from the Base Unit.

Dummy Bearer doesn't contain B-field (sound) data.

9.3. Signal Flowchart in the Whole System

Reception

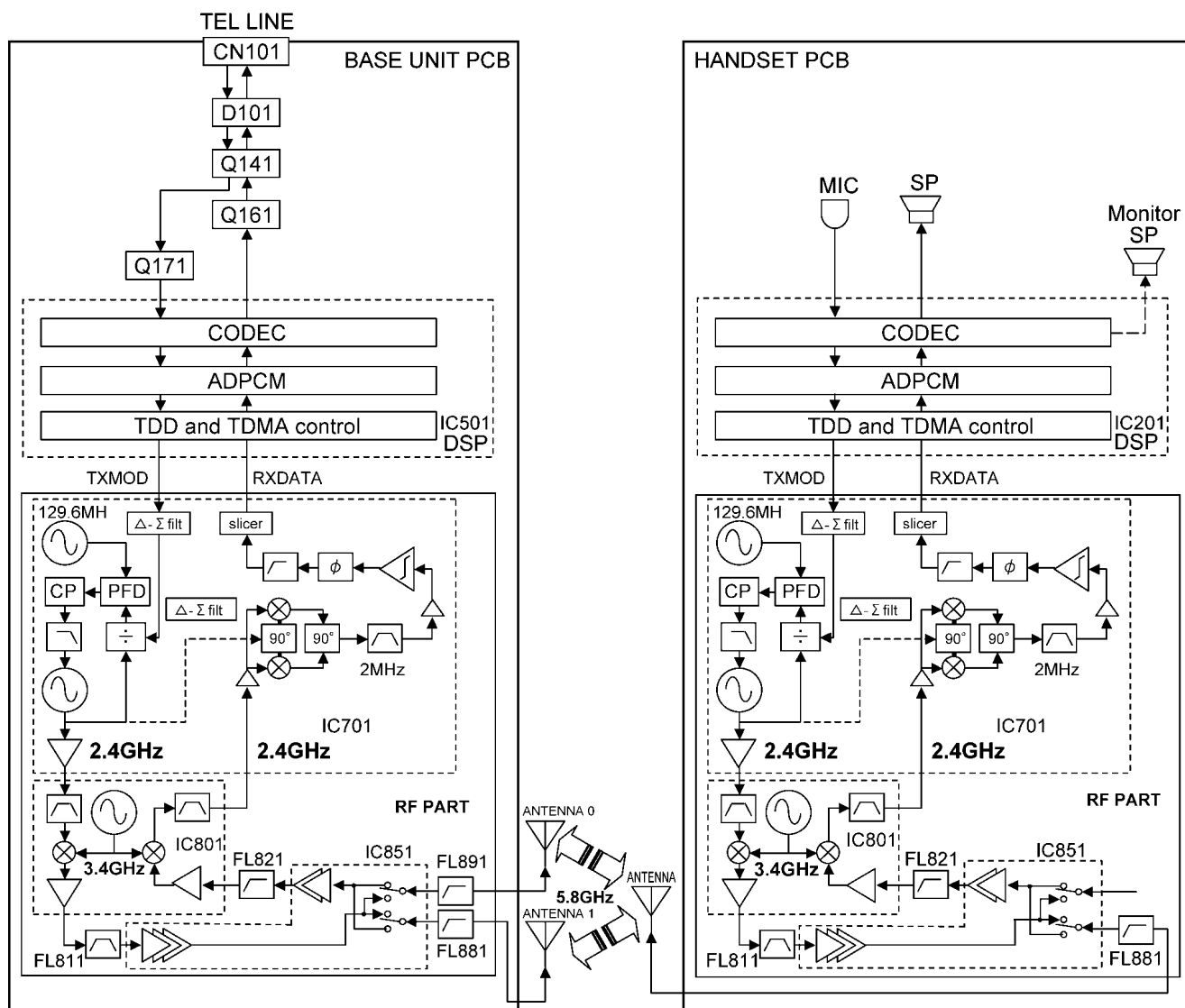
CN101 of the Base Unit is connected to the TEL line, and signal is enter through the bridge diode D101. While talking, the relay (Q141) is turned ON and amplified at the Q171, then led to DSP (IC501). The DSP encodes ADPCM and TDD/TDMA with FHSS to TXMOD. The TXMOD signal is enter to IC701 of RF PART, and modulated to 2.4GHz. The 2.4GHz signal is up-converted to 5.8GHz RF signal by IC801. The RF signal is amplified by the power amplifier (IC851) and fed to Antennas.

As for the Handset, RF signal from the antenna is amplified by LNA (IC851). The amplified signal is down-converted to 2.4GHz signal by IC801 and led to IC701. The 2.4GHz is down-converted to IF signal in IC701. The IF signal passing through internal filter is demodulated into RXDATA, then enter to DSP (IC201). The DSP performs TDD/TDMA and ADPCM decoding to convert the RXDATA into the voice signal, then it is output to the speaker.

Transission

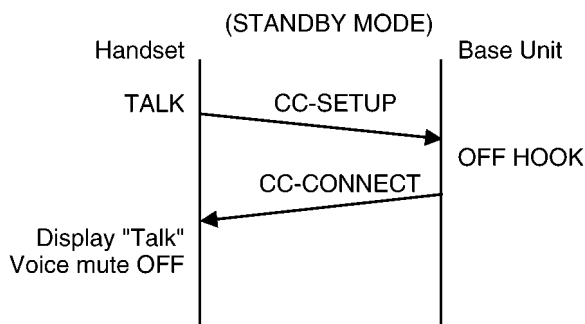
The voice signal entering from the Handset microphone is led to DSP (IC201). The DSP encodes ADPCM and TDD/TDMA with FHSS to TXMOD. The TXMOD signal is enter to IC701 of RF PART, and modulated to 2.4GHz. The 2.4GHz signal is up-converted to 5.8GHz RF signal by IC801. The RF signal is amplified by the power amplifier (IC851) and fed to Antenna.

As for the Base Unit, RF signal from the Antennas is amplified by LNA (IC851). The amplified signal is down-converted to 2.4GHz signal by IC801 and led to IC701. The 2.4GHz is down-converted to IF signal in IC701. The IF signal passing through internal filter is demodulated into RXDATA, then enter to DSP (IC501). The DSP performs TDD/TDMA and ADPCM decoding to convert the RXDATA into the voice signal. The voice signal is amplified at the TX amplifier (Q161), then output to the TEL line CN101 through the relay (Q141) and bridge (D101).



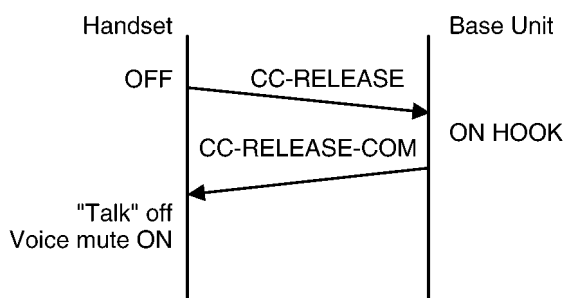
10 EXPLANATION OF LINK DATA COMMUNICATION

10.1. Calling



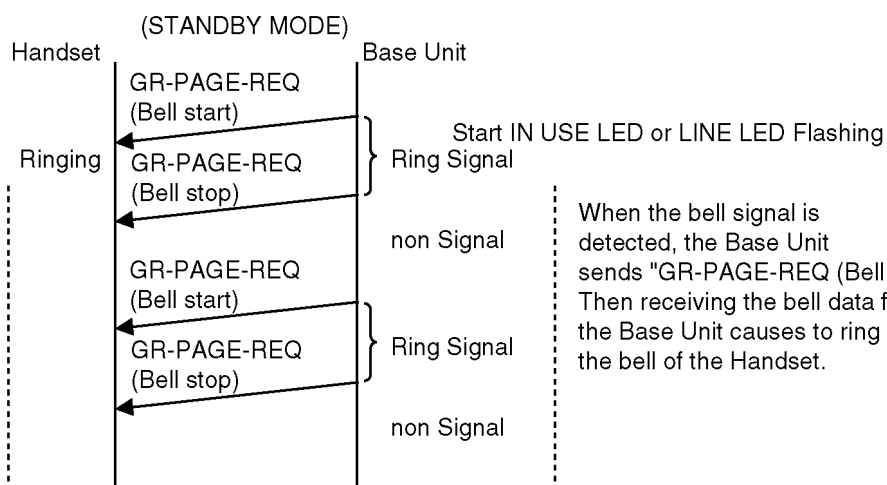
When calling, a communication request DATA (CC-SETUP) is transmitted from the Handset, and a permitting DATA (CC-CONNECT) is returned from the Base Unit to it. At that time the audio path opens.

10.2. To Terminate Communication



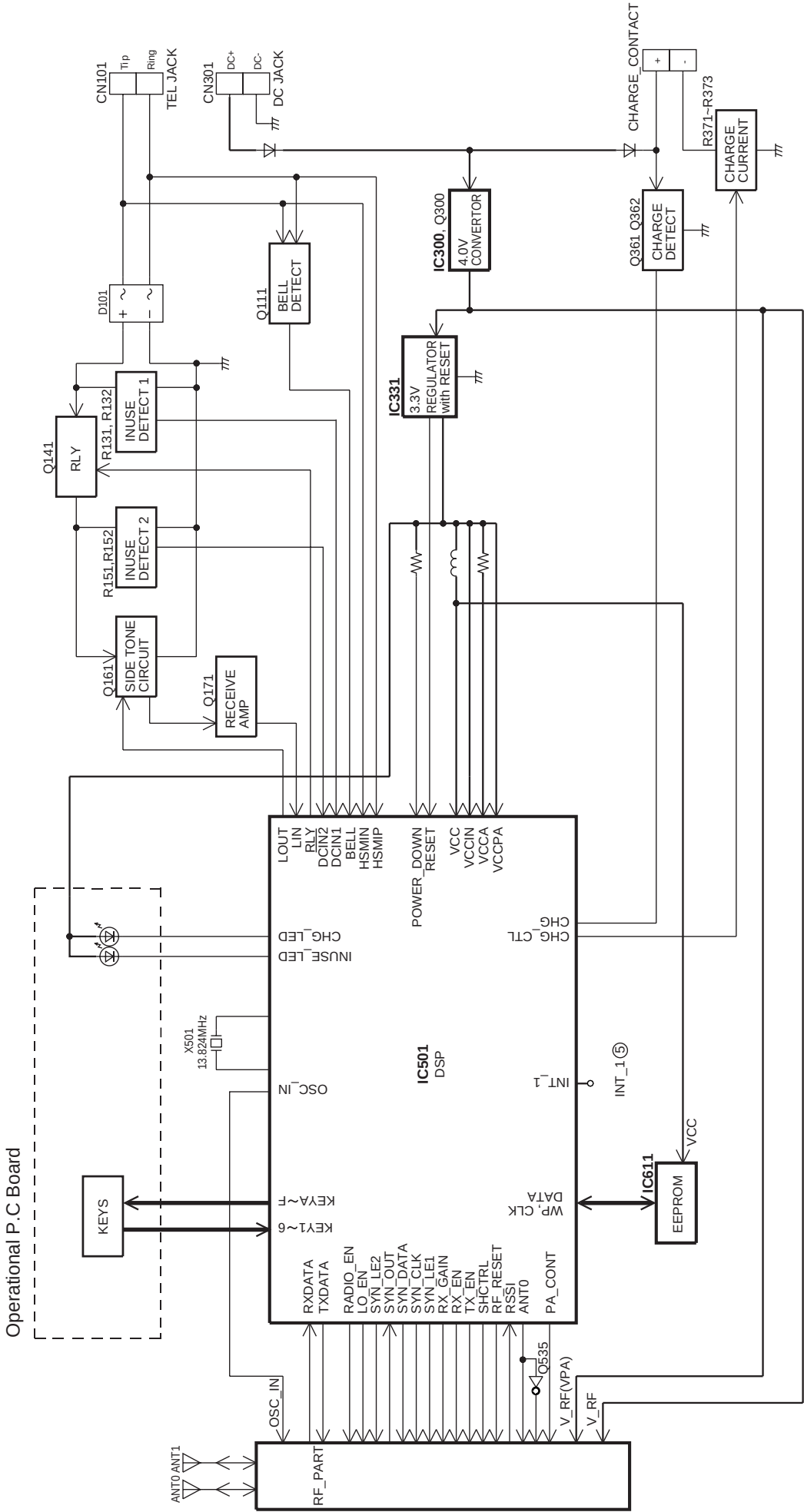
When the OFF button on the Handset is pressed during communication, a LINK terminating DATA (CC-RELEASE) is sent to terminate the communication. Then DATA (CC-RELEASE-COM) is returned from Base Unit. Handset receives it and reset the link.

10.3. Ringing



When the bell signal is detected, the Base Unit sends "GR-PAGE-REQ (Bell start)". Then receiving the bell data from the Base Unit causes to ring the bell of the Handset.

11 BLOCK DIAGRAM (BASE UNIT_MAIN)



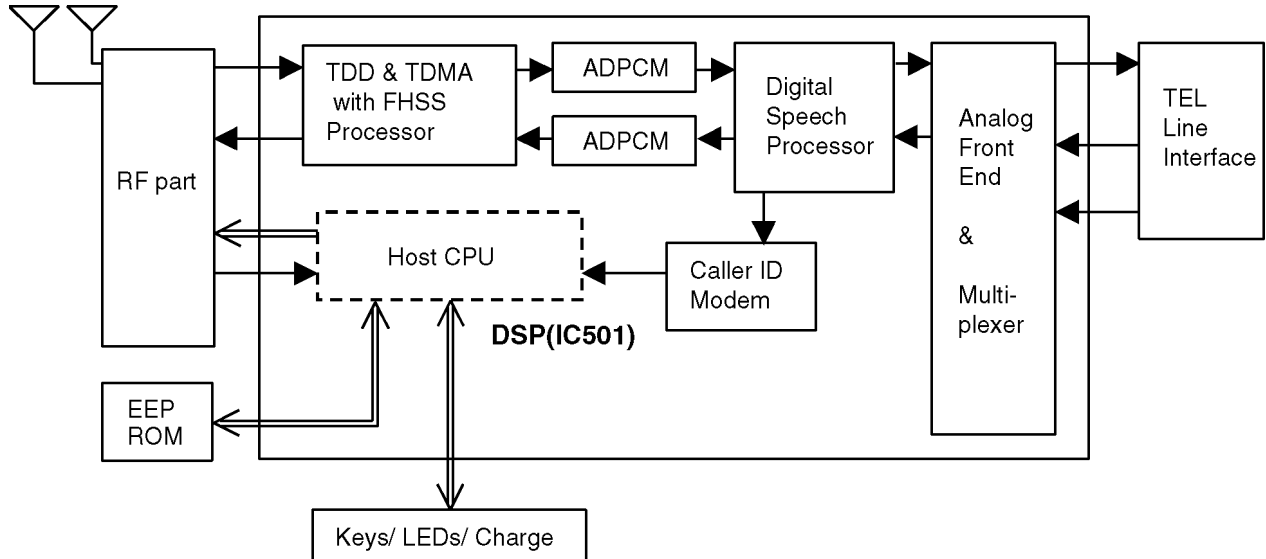
KX-TG5621 BLOCK DIAGRAM (Base Unit_Main)

12 CIRCUIT OPERATION (BASE UNIT_MAIN)

General Description:

(DSP, EEPROM) is a digital speech/signal processing system that implements all the functions of speech compression and memory management required in a digital telephone.

The DSP system is fully controlled by a host processor DSP. The host processor provides activation and control of all that functions as follows.



12.1. DSP (Digital Speech/Signal Processing: IC501)

- **DTMF Detection/Generator**

The DTMF detection is implemented by the DSP system in software. The DTMF detection is performed during Record, Play back, and Line Monitoring modes of operation.

When the DTMF data from the Handset is received, the DTMF signal is output.

- **Caller ID demodulation**

The DSP implements monitor and demodulate the FSK signals that provide CID information from the Central Office.

- **Analog Switching**

The voice signal from telephone line is transmitted to the speaker or the voice signal from speakerphone microphone is transmitted to the Telephone line, etc. They are determined by the signal path route operation of voice signal.

- **Block Interface Circuit**

RF part, LED, Key scan, Telephone line.

12.2. EEPROM: (IC611)

Following information data is stored.

- **Settings**

ex: ID code, Flash Time, Tone/Pulse

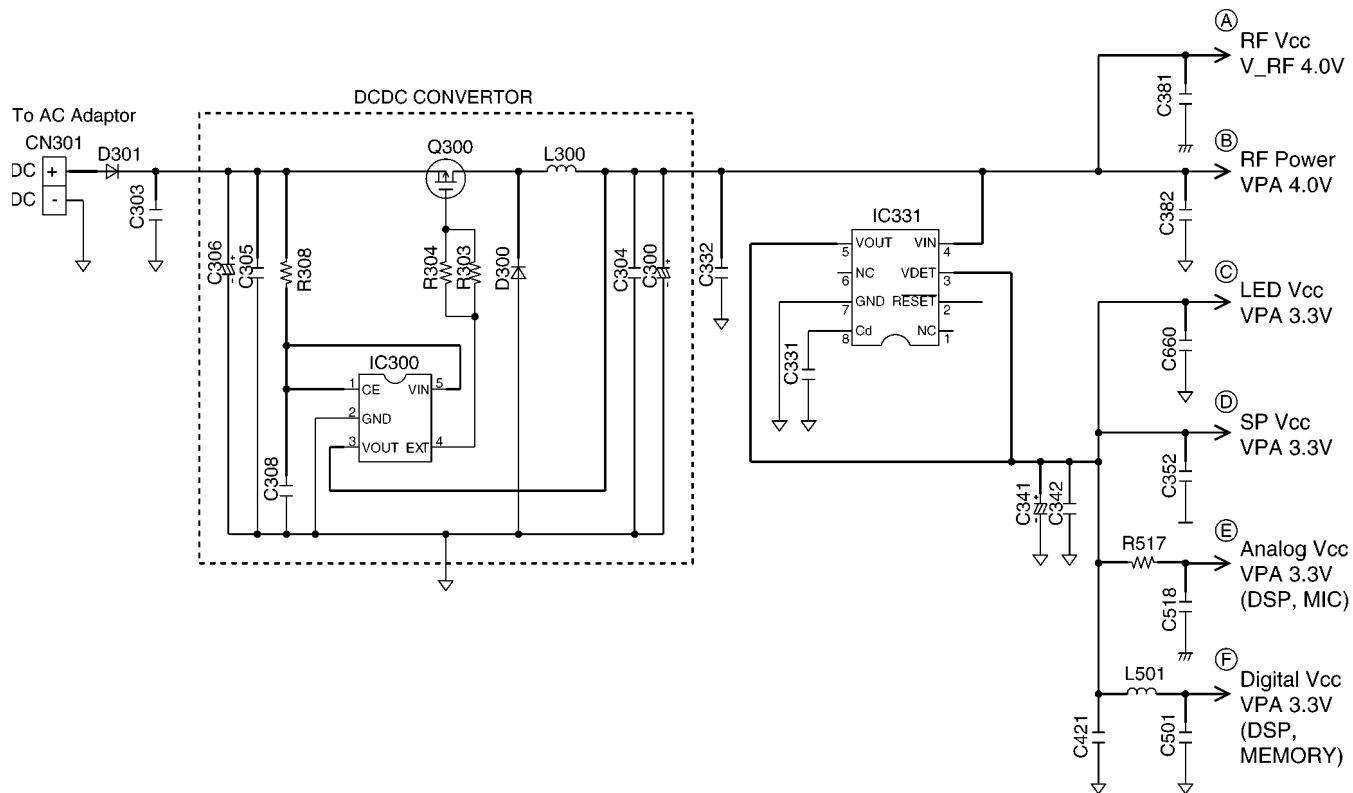
12.3. Power Supply Circuit

Function:

The power supply voltage from AC adaptor is converted to the desired voltage of each block.

Circuit Operation:

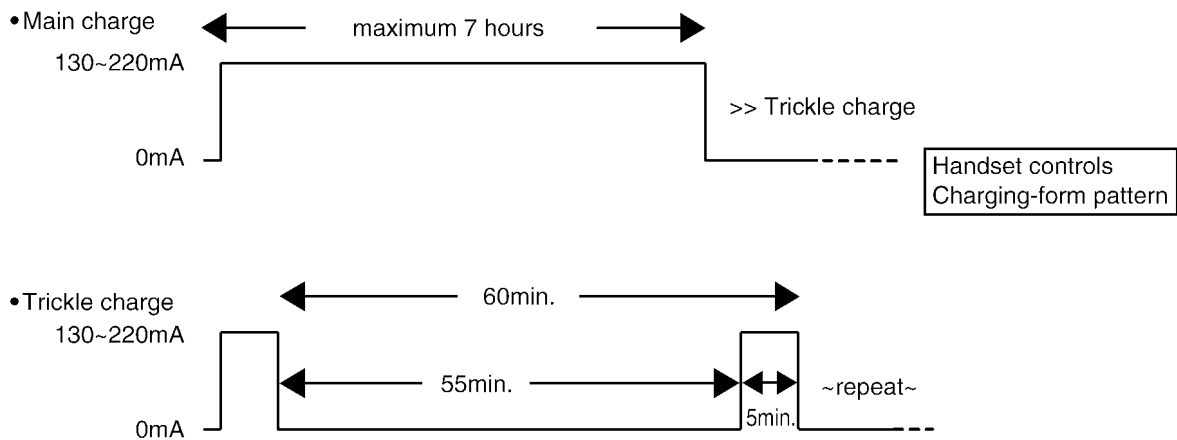
- Q300 and IC300: 4.0V DCDC Converter
- IC331: 3.3V Regulator



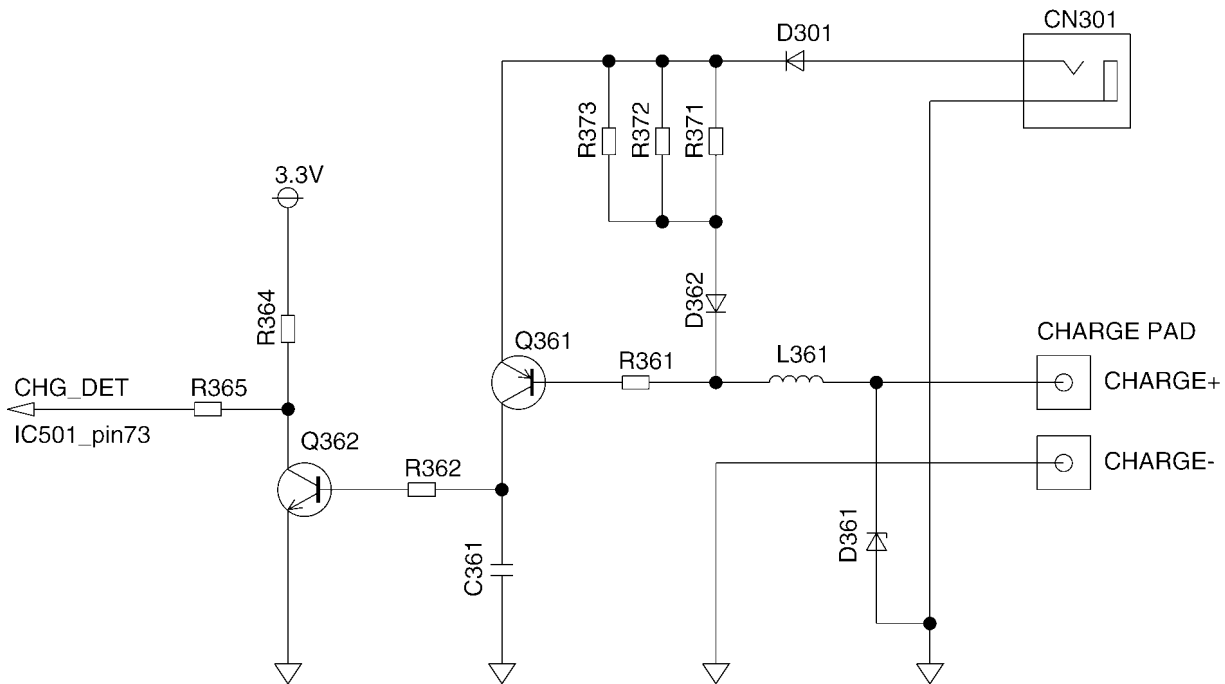
12.3.1. Charge Circuit

The voltage from the AC adaptor is supplied to the charge circuits. Main charge (130~220mA at the Battery) of maximum 7-hours is started soon after the Handset is placed on the Base Unit. Then it changes to Trickle charge to prevent from overcharging.

Charging-form



Q361 and Q362 detect the ON-HOOK state (Handset is placed on Base Unit).



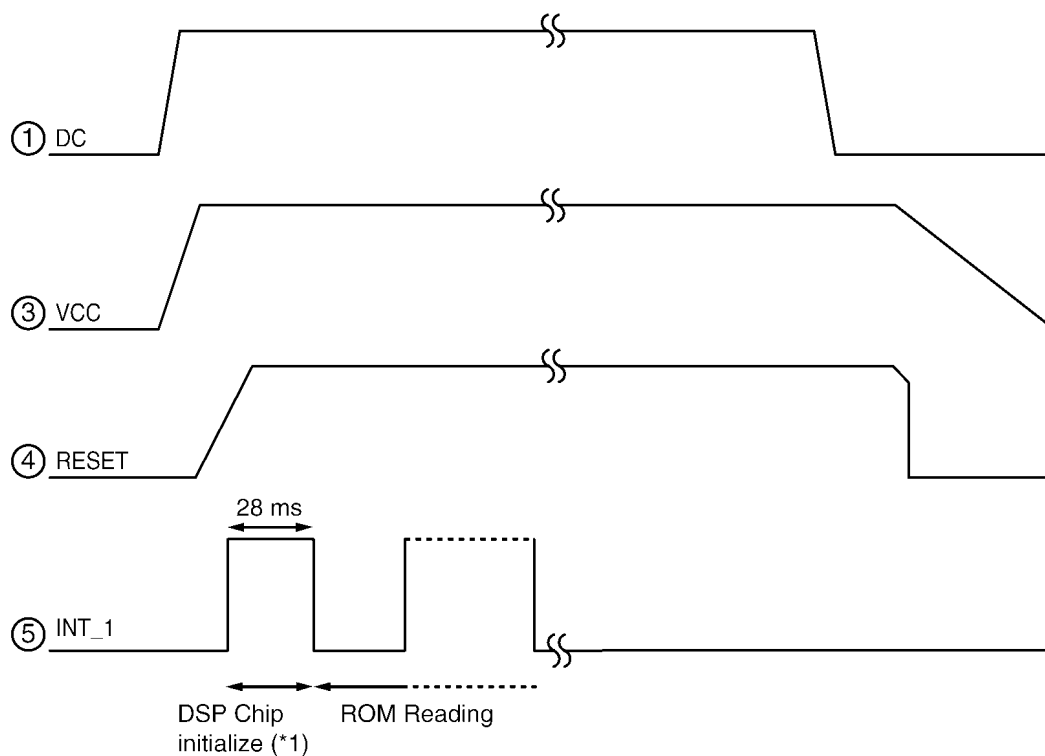
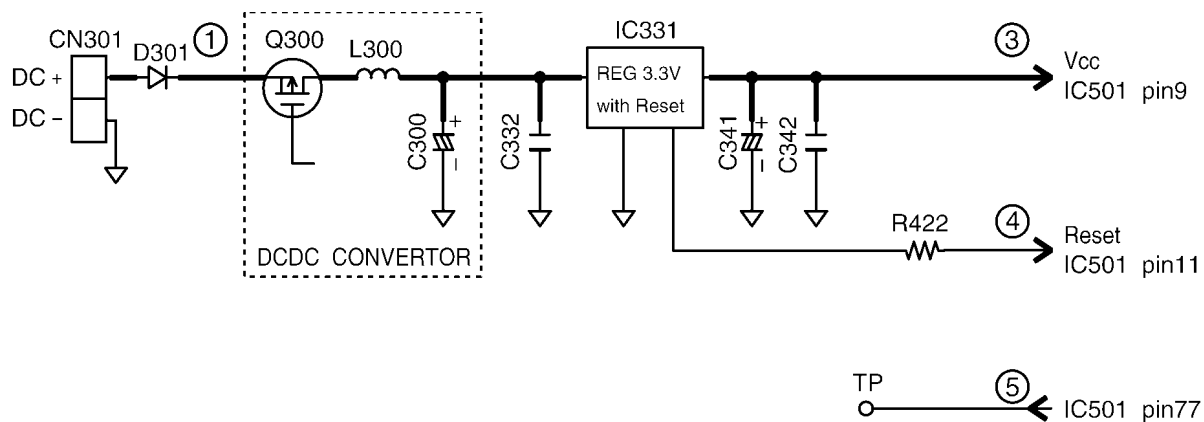
12.4. Reset Circuit

Function:

This circuit is used to initialize the microcomputer when it incorporates an AC adaptor.

Circuit Operation:

When the AC Adaptor is inserted into the unit, then the voltage is shifted by IC331 and power is supplied to the DSP. The set starts to operate when VCC goes up to 3.0V or more in the circuit voltage diagram.



Note:

(*1) The initializing time of the DSP chip is 28ms under normal conditions.

12.5. Telephone Line Interface

Telephone Line Interface Circuit:

Function

- Bell signal detection
- ON/OFF hook and pulse dial circuit
- Side tone circuit

Bell signal detection and OFF HOOK circuit:

In the idle mode, Q141 is open to cut the DC loop current and decrease the ring load. When ring voltage appears at the Tip (T) and Ring (R) leads (When the telephone rings), the AC ring voltage is transferred as follows:

$T \rightarrow L101 \rightarrow R111 \rightarrow C111 \rightarrow Q111 \rightarrow \text{DSP pin 3 [BELL]}$

When the CPU (DSP) detects a ring signal, Q141 turns on, thus providing an off-hook condition (active DC current flow through the circuit). Following signal flow is the DC current flow.

$T \rightarrow L101 \rightarrow D101 \rightarrow Q141 \rightarrow Q161 \rightarrow R163 \rightarrow D101 \rightarrow L102 \rightarrow P101 \rightarrow R$

ON HOOK Circuit:

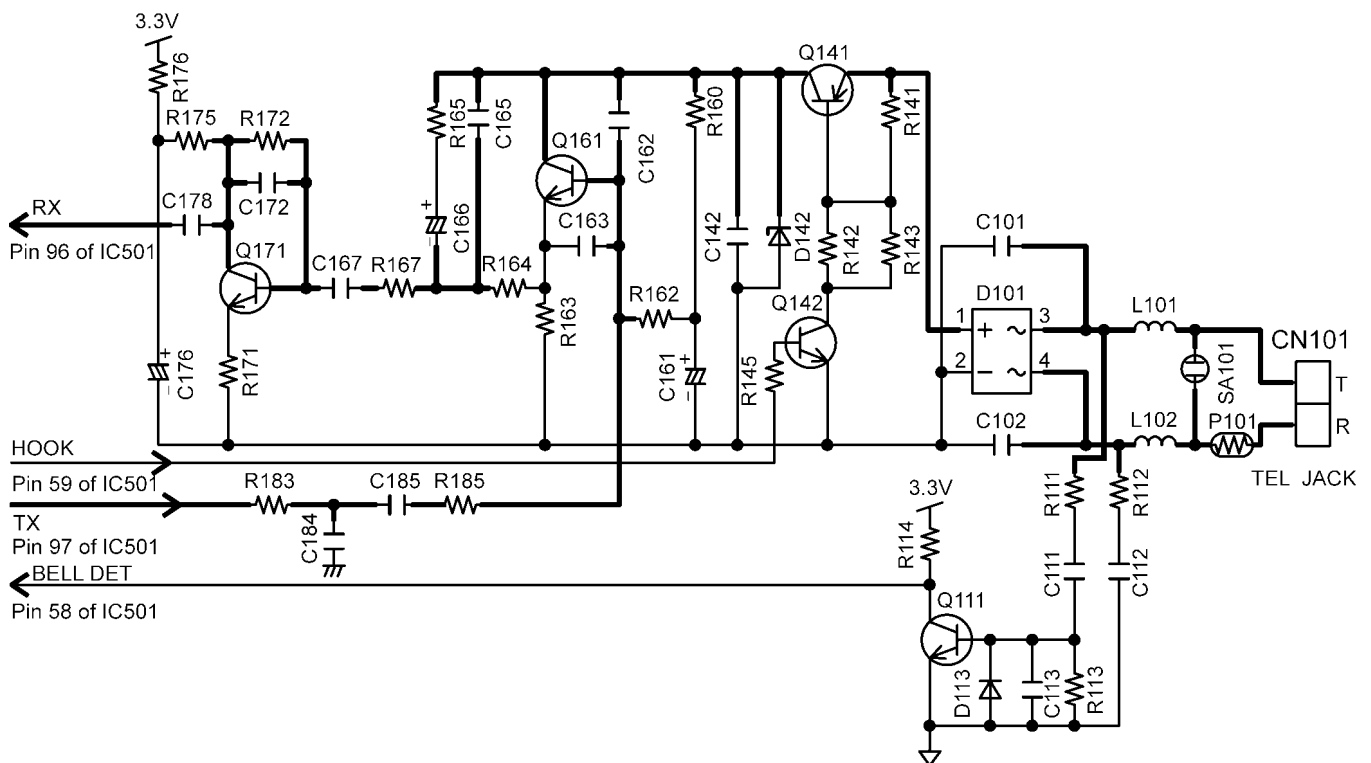
Q141 is open, Q141 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

Pulse Dial Circuit:

Pin 59 of DSP turns Q141 ON/OFF to make the pulse dialing.

Side Tone Circuit:

Basically this circuit prevents the TX signal from feeding back to RX signal. As for this unit, TX signal feed back from Q161 is canceled by the canceller circuit of DSP.



12.6. Parallel Connection Detect Circuit

Function:

In order to disable call waiting and stutter tone functions when using telephones connected in parallel, it is necessary to have a circuit that judges whether a telephone connected in parallel is in use or not. This circuit determines whether the telephone connected in parallel is on hook or off hook by detecting changes in the T/R voltage.

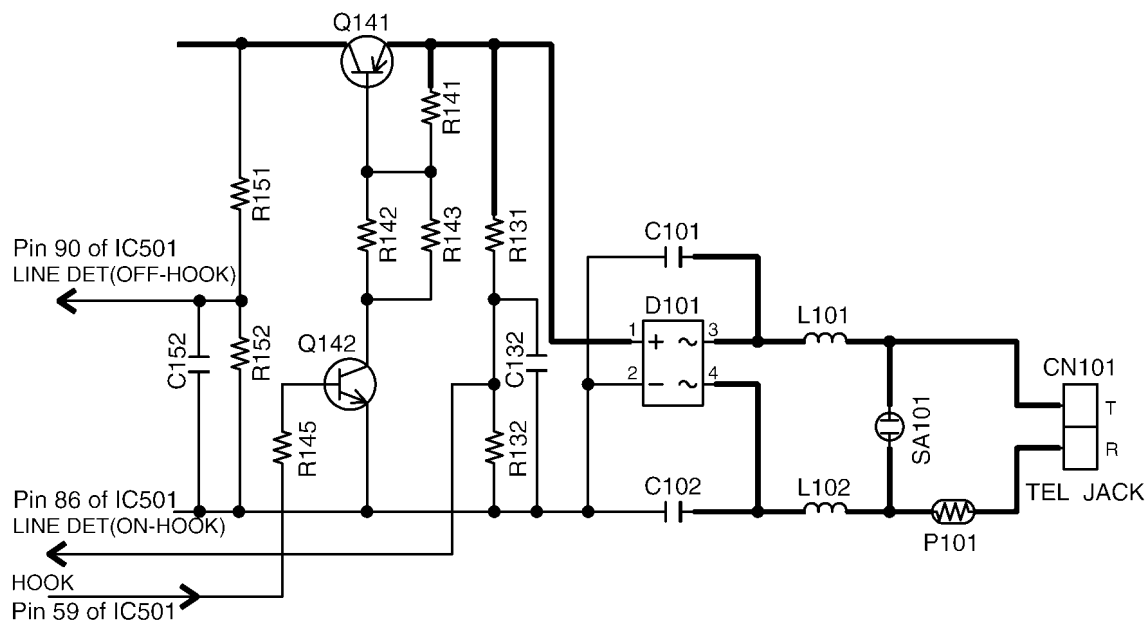
Circuit Operation:

Parallel connection detection when on hook:

When on hook, the voltage is monitored at pin 86 of IC501. There is no parallel connection if the voltage is 1.65 V or higher, while a parallel connection is deemed to exist if the voltage is lower.

Parallel connection detection when off hook:

When off hook, the voltage is monitored at pin 90 of IC501; the presence/absence of a parallel connection is determined when the voltage changes by 0.2 V or more.



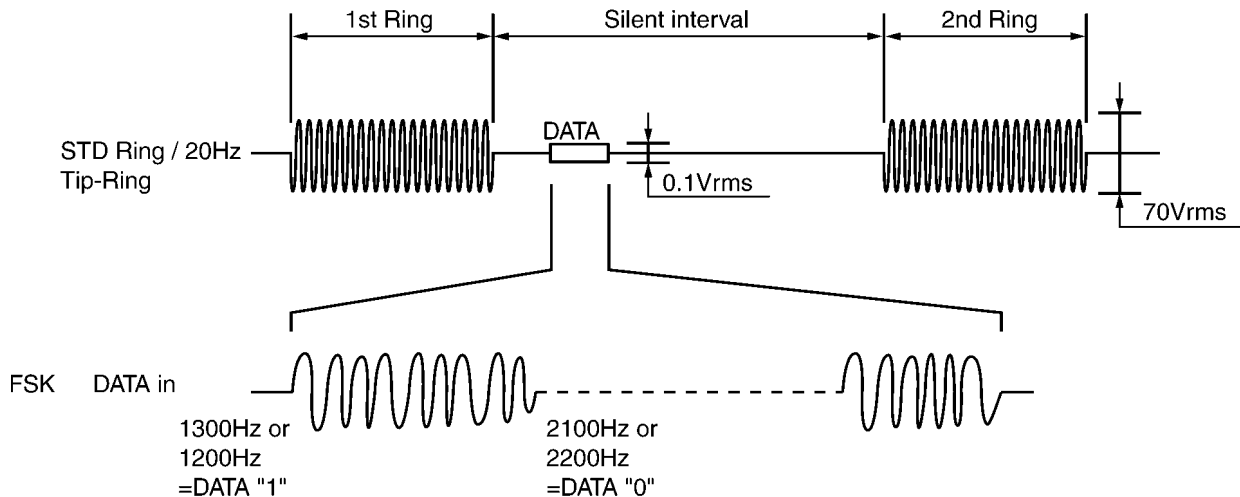
12.7. Calling Line Identification (Caller ID)

Function:

The caller ID is a chargeable ID which the user of a telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation of this circuit assumes that a caller ID service contract has been entered for the circuit being used.

The Caller-ID data from exchange is supplied to the telephone using either method of FSK or DTMF. The method is chosen according to the exchange of telephone office. This unit is available to receive the data with both methods and displays the received data on LCD.

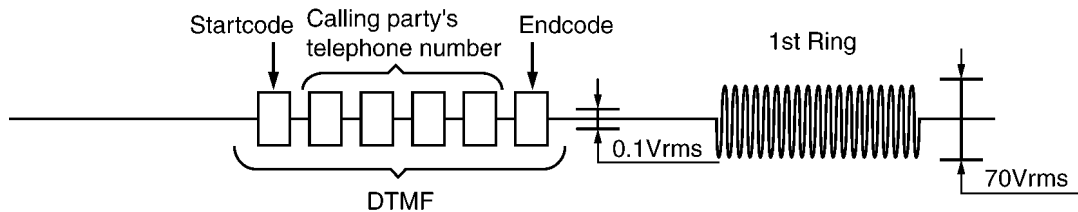
• FSK (Frequency Shift Keying) format



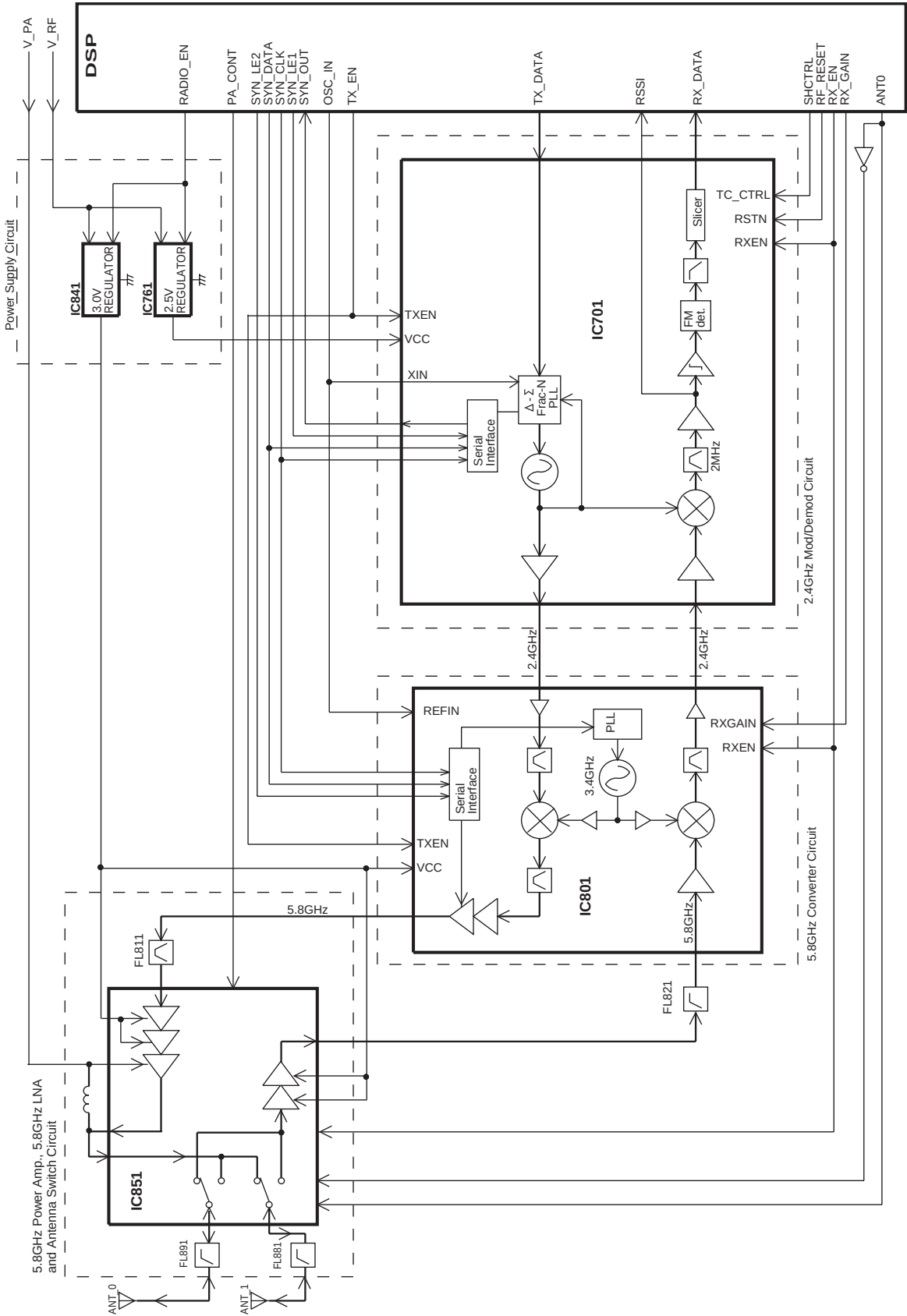
• DTMF format

It is the method to send the telephone number of calling party with DTMF to the telephone. DTMF is sent before the first bell signal. The data is sent in turn; first the start code, secondly the telephone number of calling party, lastly end code.

The DTMF is chosen from A (1633Hz and 697Hz), B (1633Hz and 770Hz), C (1633Hz and 852Hz) and D (1633Hz and 941Hz) as the start code and end code according to the exchange.



13 BLOCK DIAGRAM (BASE UNIT_RF PART)



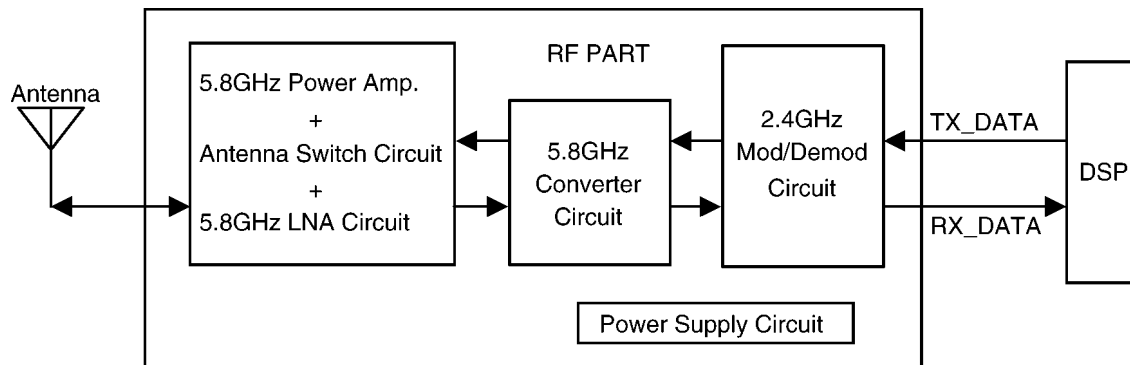
KX-TG5621 BLOCK DIAGRAM (Base Unit_RF Part)



15 CIRCUIT OPERATION (RF PART)

General Description:

RF part includes Transmitter and Receiver functions. Digital signals (Mainly voice data) that come from DSP, are modulated and are transmitted. On the other hand, received signals are demodulated and go out to DSP.



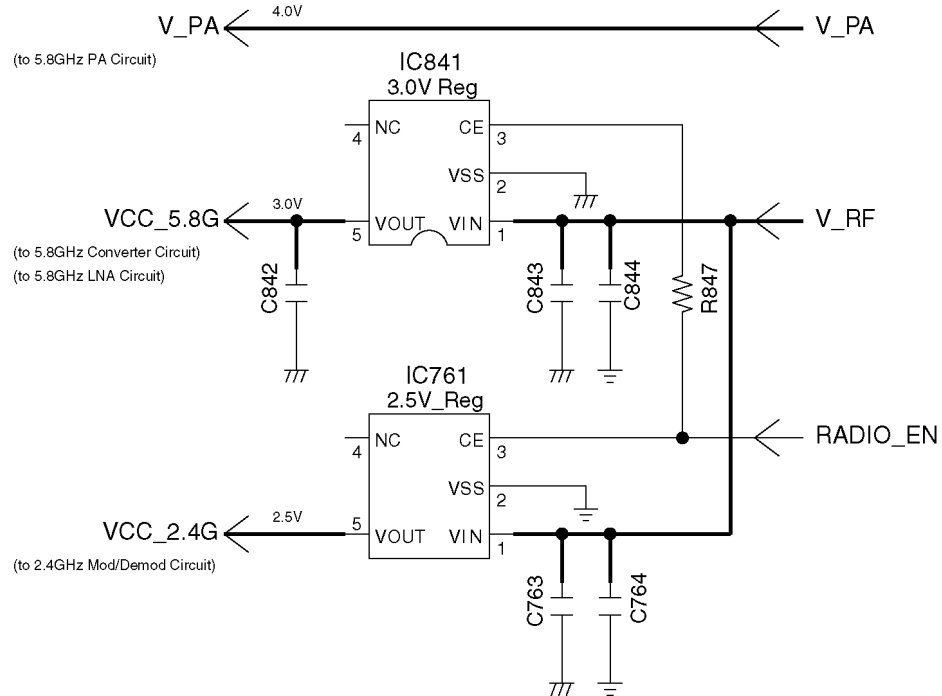
15.1. Power Supply Circuit

As indicated below, the various voltages are supplied to each block.

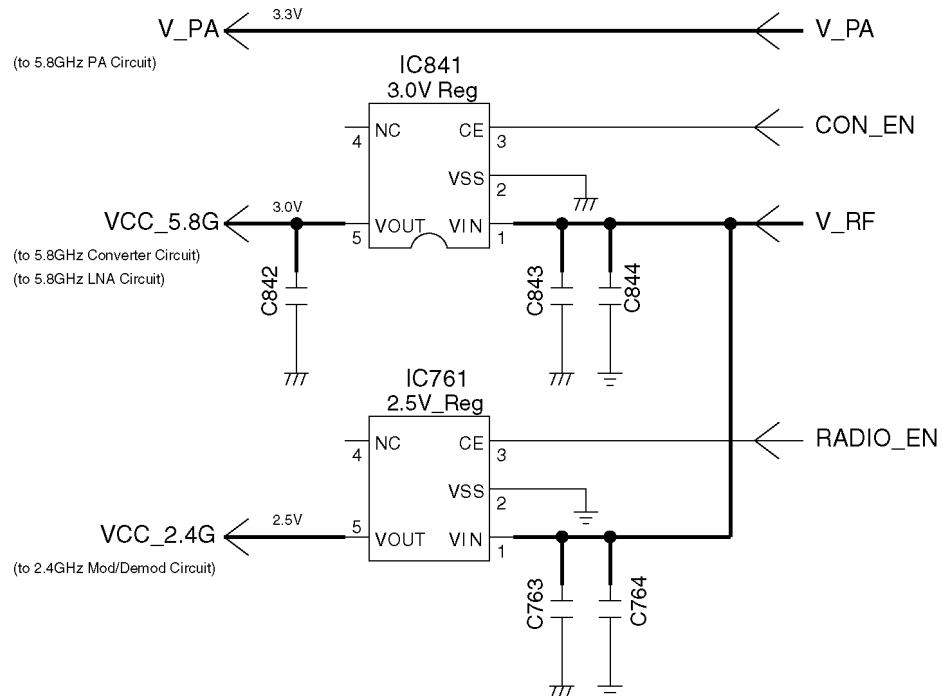
V_PA, about 4.0V at Base Unit or 3.3V at Handset, is supplied to the Power amplifier in 5.8GHz PA circuit.

IC841 is 3.0V Regulators, and IC761 is a 2.5V Regulator. They output Vcc_5.8GHz, and Vcc_2.4GHz respectively by order of RADIO_EN signal or CON_EN signal. V_RF is approximately 4.0V (Base Unit) or 3.6V (Handset).

<Base Unit>

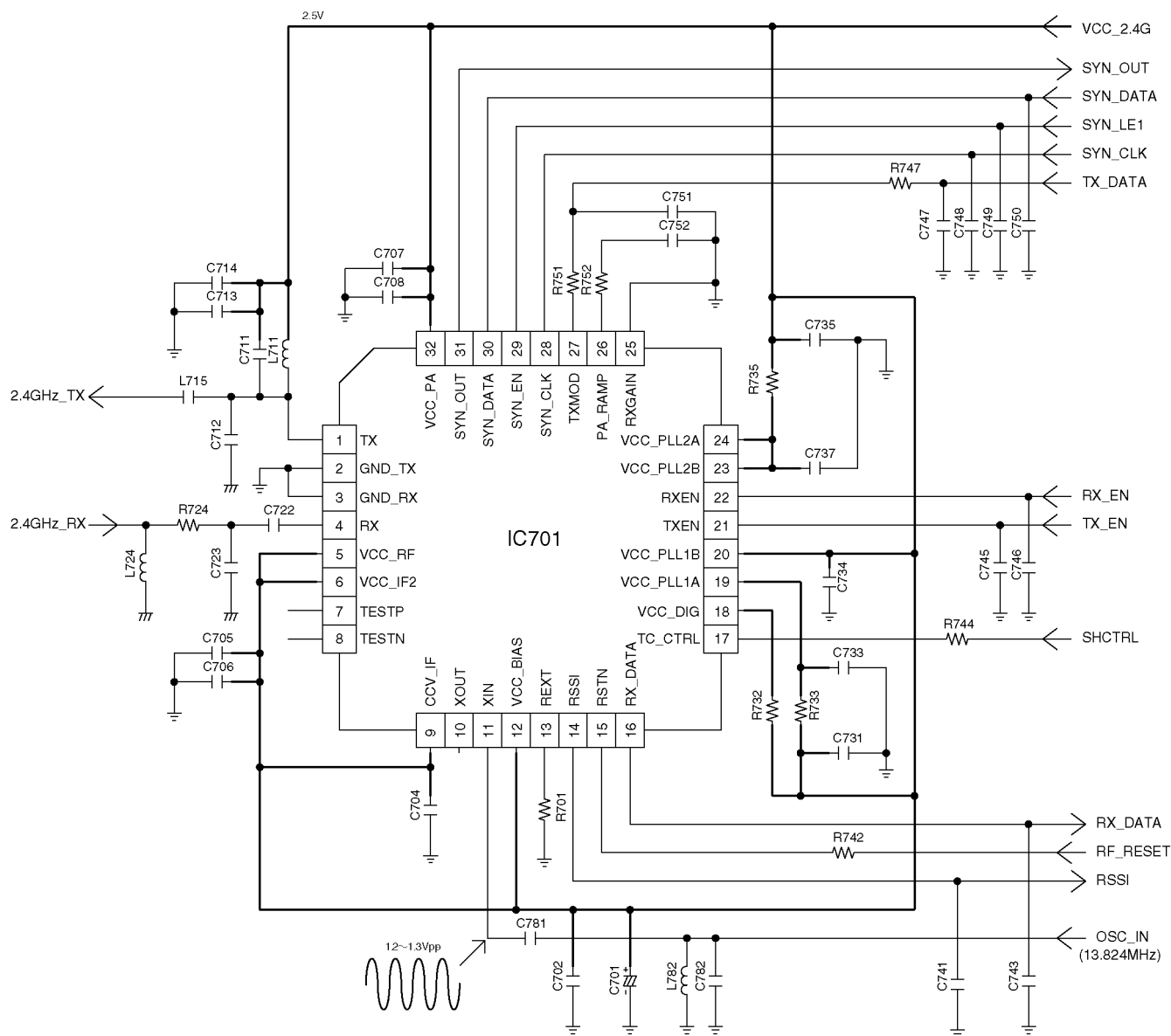


<Handset>



15.2. 2.4GHz Mod/Demod Circuit

IC701 incorporates all of the modulation and demodulation functions. TX Digital data (TX_DATA) from DSP is supplied to pin 27 of IC701, and then 2.4GHz TX modulated signal is output from pin1. This TX signal goes into the 5.8GHz Converter circuit. 2.4GHz RX signal from 5.8GHz Converter circuit is passed through matching circuit and supplied to pin4 of IC701, then demodulated signal (RX_DATA) comes out from pin 16. At the same time, RSSI (Received Signal Strength Indicator) outputs from the pin 14. Reference clock (13.824MHz) from DSP block is supplied to pin 11 of IC701. VCC_2.4G supplies 2.5V regulated voltage.



Note:

The exposed GND-PLATE on the bottom of the IC701 supplies the circuit ground(s) for the entire chip. It is very important that a good solder connection is made between this GND-PLATE and the ground plane of the PCB underlying the IC701.

15.3. 5.8GHz Converter Circuit

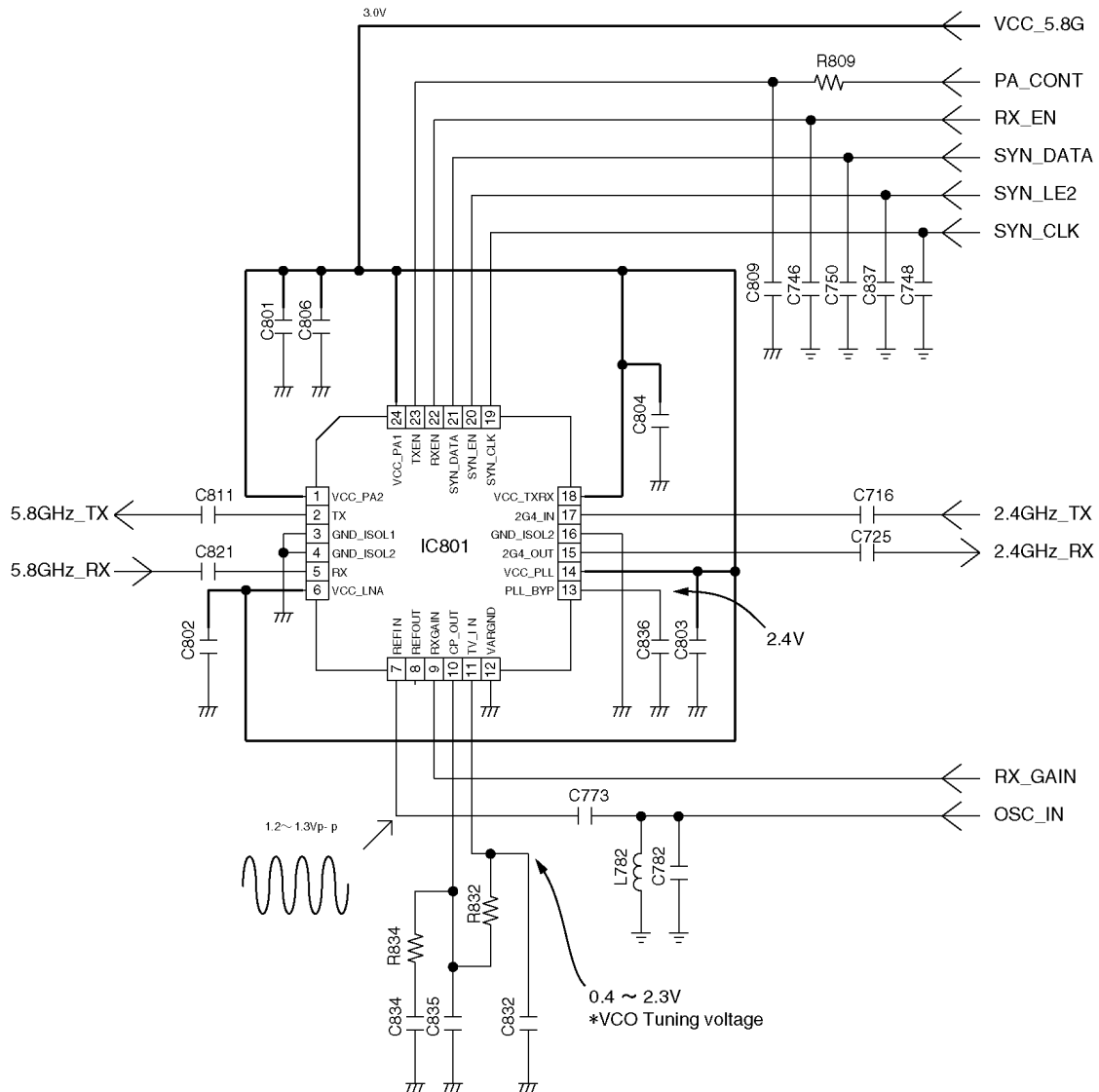
This block converts frequency of TX signal and RX signal.

IC801 includes TX-MIXER, RX-MIXER, PLL and VCO modules internally.

The VCO module is tuned by PLL synthesizer module, and generates 3.4GHz Local signal. Reference clock (13.824MHz) from DSP block is supplied to pin7 of IC701.

2.4GHz TX signal from 2.4GHz Mod/Demod circuit is supplied to pin 17 of IC801, and internal TX-MIXER multiplies it by 3.4GHz Local signal from internal VCO module, and up-converts into 5.8GHz TX signal. This 5.8GHz TX signal is output from pin 2, and goes into the 5.8GHz PA circuit.

5.8GHz RX signal from 5.8GHz LNA circuit supplied to pin 5 of IC801, and internal RX-MIXER multiplies it by 3.4GHz Local signal from internal VCO module, and down-converts into 2.4GHz RX signal. This 2.4GHz RX signal is output from pin 15, and goes into the 2.4GHz Mod/Demod circuits.



Note:

The exposed GND-PLATE on the bottom of the IC801 supplies the circuit ground(s) for the entire chip. It is very important that a good solder connection is made between this GND-PLATE and the ground plane of the PCB underlying the IC801.

15.4. 5.8GHz PA (Power Amplifier), 5.8GHz LNA (Low Noise Amplifier) and Antenna Switch Circuit

PA block amplifies power of 5.8GHz TX signal.

5.8GHz TX signal from 5.8GHz Converter circuit is filtered by 5.8GHz-BPF FL811, and amplified by Power amplifier (PA) block of IC851. After that, it is supplied to Antenna Switch block of IC851. V_PA is approximately 4.0V at Base Unit, and 3.3V at Handset.

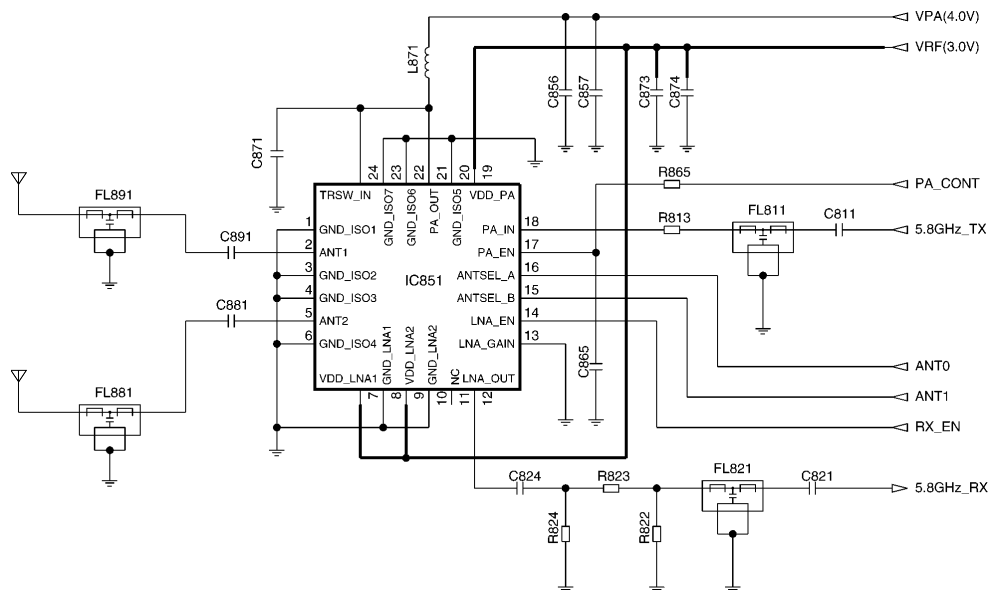
LNA block amplifier receiving 5.8GHz signal. 5.8GHz RX signal from Antenna Switch block of IC851 amplified by LNA block of IC851 and filtered by HPF (FL821), and then supplied to 5.8GHz converter circuit.

Antenna Switch block selects the TX 5.8GHz signal or RX 5.8GHz signal, and connect to Antenna terminal.

Note:

The exposed GND-PLATE on the bottom of the IC851 supplies the circuit ground(s) for the entire chip. It is very important that a good solder connection is made between this GND-PLATE and the ground plane of the PCB underlying the IC851.

<Base Unit>

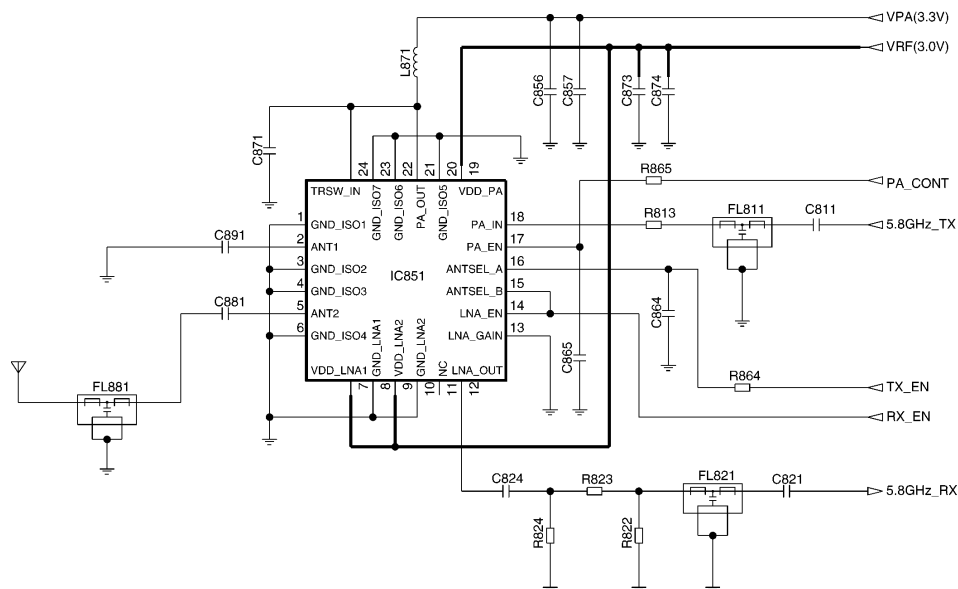


IC851 includes Switches for High frequency signals, and controlled by ANT0 signal and ANT 1 signal from DSP.

DSP is checking RSSI (Received Signal Strength Indicator) signal, and selects better condition Antenna from two antennas.

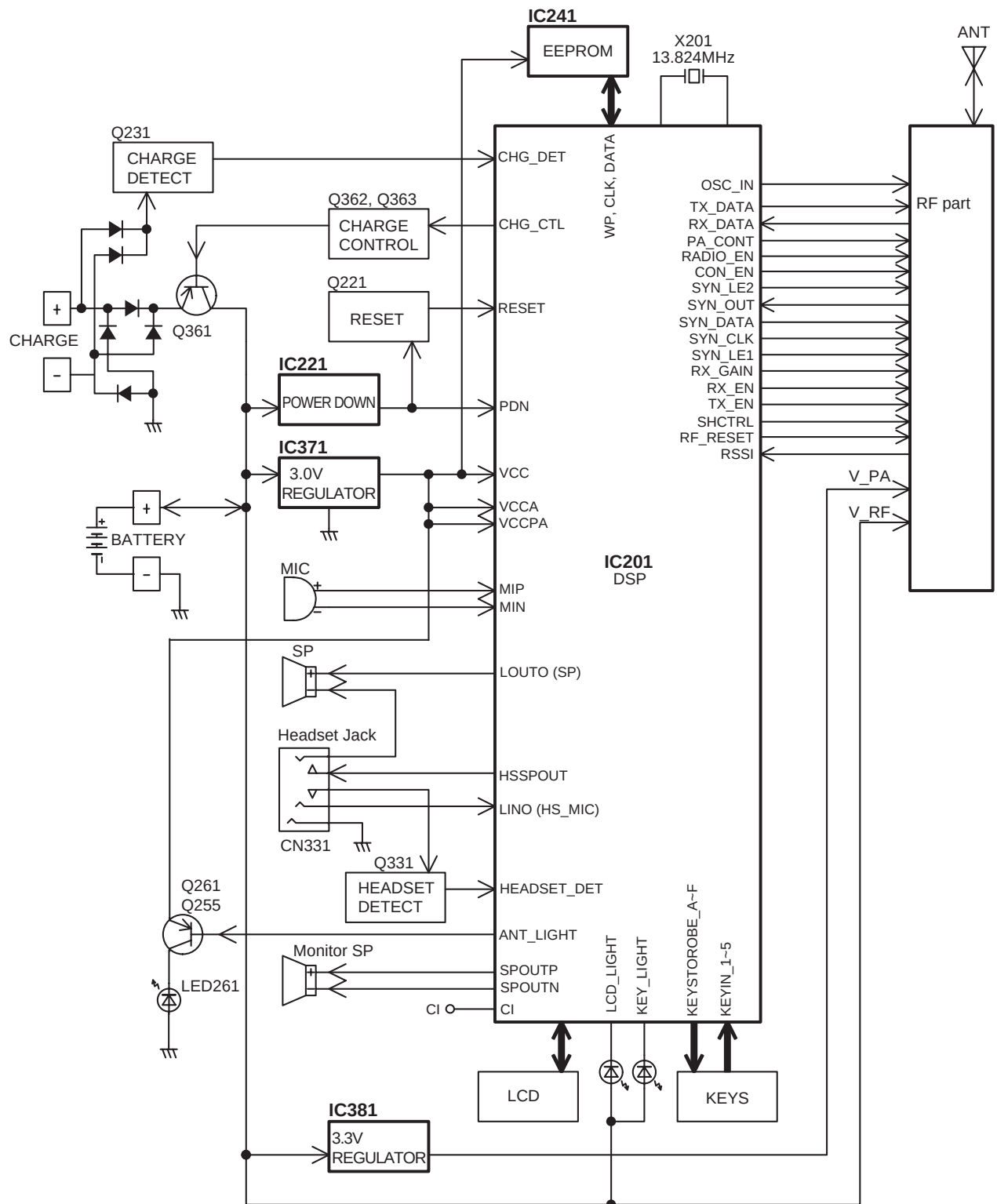
At the TX mode 5.8GHz TX signal from 5.8GHz PA block leads to selected Antenna terminal, at the RX mode 5.8GHz RX signal from selected Antenna terminal leads to 5.8GHz LNA block.

<Handset>



IC851 includes Switch for High frequency signals, and controlled by PA_CONT signal and RX_EN signal from DSP. At the TX mode 5.8GHz TX signal from 5.8GHz PA block leads to Antenna terminal, at the RX mode 5.8GHz RX signal from Antenna terminal leads to 5.8GHz LNA block.

16 BLOCK DIAGRAM (HANDSET)



KX-TGA561 BLOCK DIAGRAM (Handset)

17 CIRCUIT OPERATION (HANDSET)

17.1. Construction

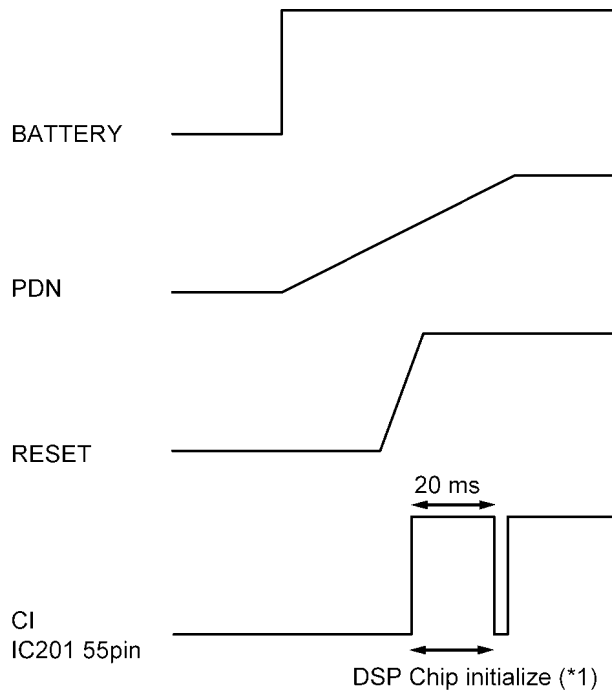
The circuit mainly consists of DSP and RF part as shown in the block diagram.

17.1.1. DSP: IC201

Function

- Battery Low, Power down detect circuit
 - Ringer Generation
 - Interface circuit
- RF part, Speaker, Mic, LED, Key scan, LCD, Headset

Initial waves



Note:

(*1) The initializing time of the DSP chip is 20ms under normal conditions.

17.1.2. RF part

Mainly voice signal is modulated to RF, or it goes the other way.

17.1.3. EEPROM: IC241

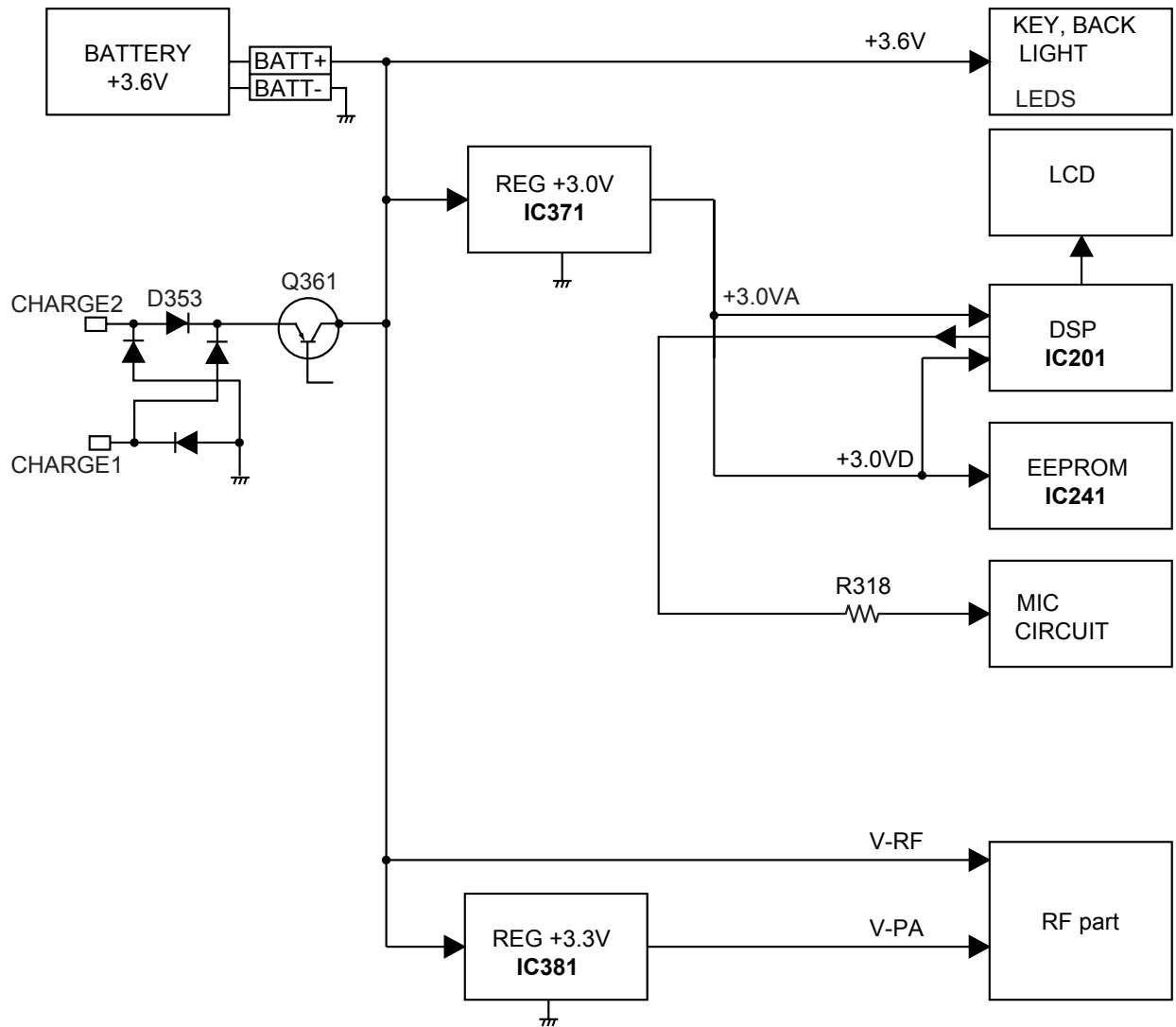
All setting data is stored.

ex: ID code, user setting (Phonebook, Caller ID data)

17.2. Power Supply Circuit

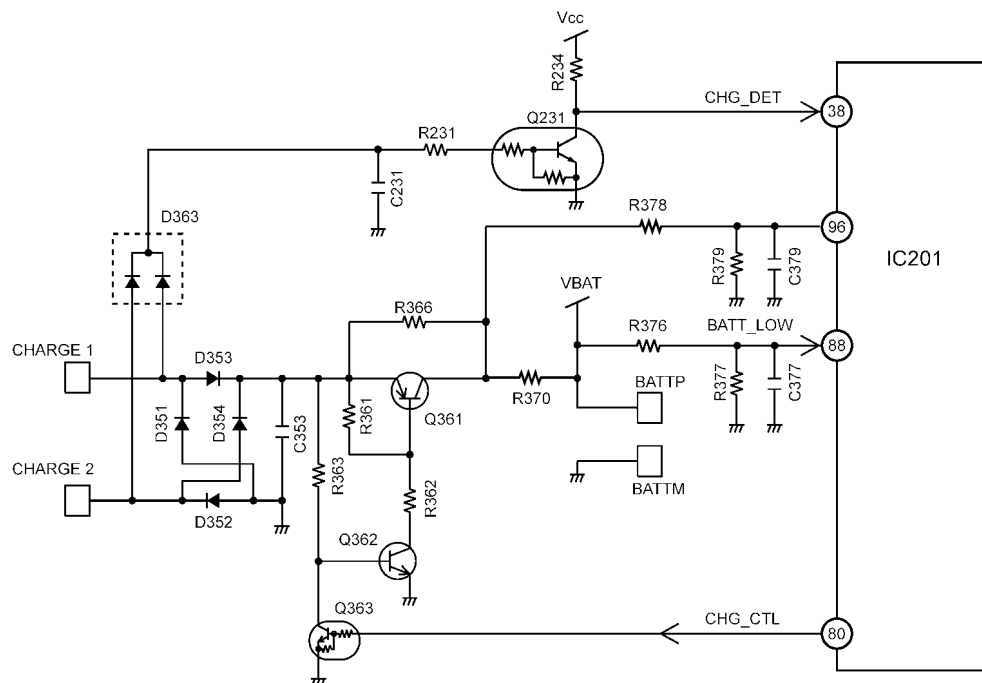
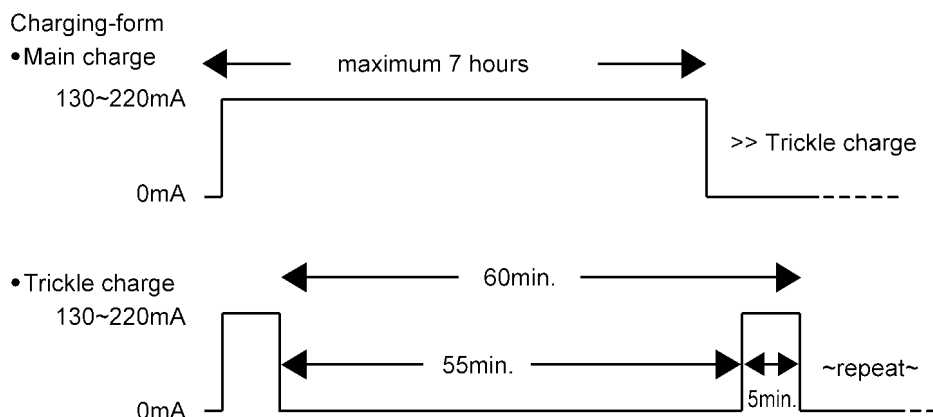
Voltage is supplied separately to each block.

Block Diagram (Handset Power)



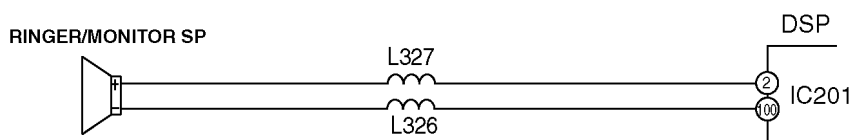
17.3. Charge Circuit

When the Handset is put on the cradle of the Base unit or the charger, the power is supplied from CHARGE+ and CHARGE- terminals to charge the battery via D353 and R366 or Q361. The voltage between CHARGE+ and CHARGE- flows R231 → Q231 → pin38 of IC201, where the charge is detected. Then IC201 calculates the battery consumption amount from the previous charge, and it controls Q361/Q362/Q363 by pin80 of IC201 until charging is complete. When charging is complete, the control pattern is switched to Trickle charging form from Operational charging form.



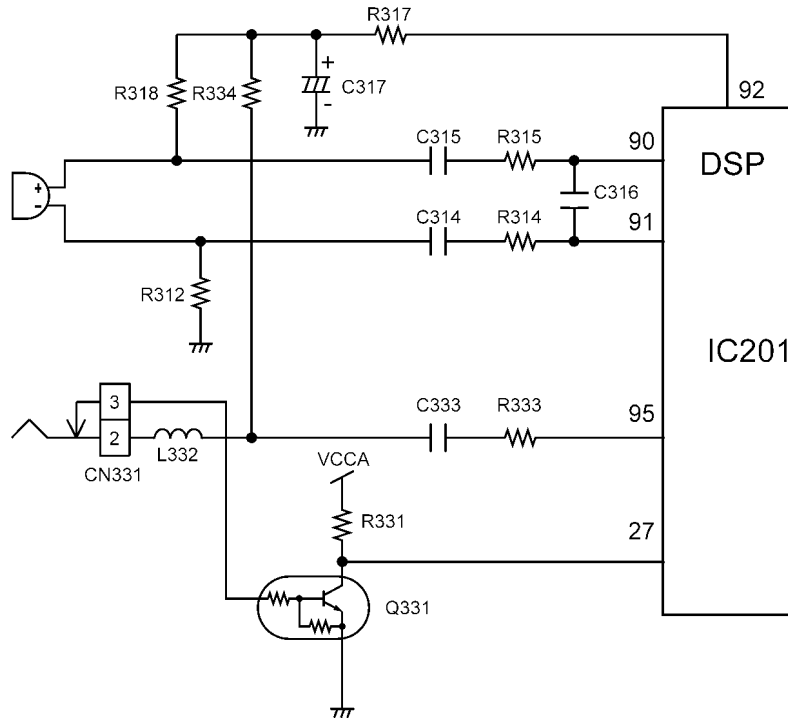
Pin 88 of IC201 monitors the battery voltage and detect BATT LOW at 3.50V.

17.4. Ringer and Handset SP-Phone



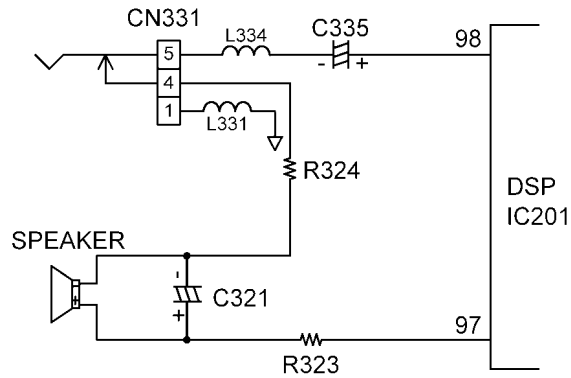
17.5. Sending Signal

The voice signal from the microphone is input to DSP (90, 91). CN331 is the headset jack. When the headphone is connected, the Q331 detect it. The input from the microphone of the Handset (MIN, MIP) is cut and the microphone signal from the headset is input to DSP (95). Also the power for the microphone is supplied from DSP (92) and the power is turned OFF on standby.



17.6. Reception Signal

The voice signal from the Base Unit is output to DSP (98). This signal is led to the headset jack (CN331). The signal through the headset jack and the other signal output from DSP (97) drives the speaker. When the headset is inserted to the jack, the voice signal is cut at the jack, so the sound does not come out from the speaker, but from the headset only.



18 SIGNAL ROUTE

Each signal route is as follows.

SIGNAL ROUTE	IN	→	ROUTE	→	OUT
HANDSET TX	HANDSET MIC - C314/C315 - R314/R315 - IC201(91/90 - 20) - <HANDSET_RF_TX_ROUTE> - ANT. --- ---ANT. - <BASE_UNIT_RF_RX_ROUTE> - IC501(34 - 97) - R183- C185 - R185 - Q161 - Q141 - D101 - L101/L102 - CN101(TEL LINE)				
HANDSET RX	CN101(TEL LINE) - L101/L102 - D101 - Q141 - C165 - R167 - C167 - Q171 - C178 - R178 - IC501(96 - 18) - <BASE_UNIT_RF_TX_ROUTE> - ANT. --- --- ANT. - <HANDSET_RF_RX_ROUTE> - IC201(36 - 98/97) - [C335 - L334 - HEADSET_JACK(5 - 4) - R324]/R323- HANDSET SPEAKER				
HEADSET TX	HEADSET_JACK(2) - L332 - C333 - R333 - IC201(95 - 20) - <HANDSET_RF_TX_ROUTE> - ANT. --- ---ANT. - <BASE_UNIT_RF_RX_ROUTE> - IC501(34 - 97) - R183 - C185 - R185 - Q161- Q141 - D101 -L101/L102 - CN101(TEL LINE)				
HEADSET RX	CN101(TEL LINE) - L101/L102 - D101 - Q141 - C165 - R167 - C167 - Q171 - C178 - R178 - IC501(96 - 18) - <BASE_UNIT_RF_TX_ROUTE> - ANT. --- --- ANT. - <HANDSET_RF_RX_ROUTE> - IC201(36 - 98) - C335 - L334 - HEADSET_JACK(5)				
HANDSET SP-Phone TX	HANDSET MIC - C314/C315 - R314/R315 - IC201(91/90 - 20) - <HANDSET_RF_TX_ROUTE> - ANT. --- ---ANT. - <BASE_UNIT_RF_RX_ROUTE> - IC501(34 - 97) -R183 - C185 -R185 -Q161 -Q141 - D101 - L101/L102 -CN101(TEL LINE)				
HANDSET SP-Phone RX	CN101(TEL LINE) - L101/L102 - D101 - Q141 - C165 - R167 - C167 - Q171 - C178 -R178 - IC501(96 - 18) - <BASE_UNIT_RF_TX_ROUTE> - ANT. --- --- ANT. -<HANDSET_RF_RX_ROUTE> - IC201(36 - 2/100) - L327/L326 - MONITOR SP				
DTMF SIGNAL TO TEL LINE	IC501(97) - R183 - C185 - R185 - Q161 - Q141 - D101 - L101/L102 - CN101(TEL LINE)				
DTMF DETECTION	CN101(TEL LINE) - L101/L102 - D101 - Q141 - C165 - R167 - C167 - Q171 - C178 - R178 - IC501(96)				
CALLER ID	CN101(TEL LINE) - L101/L102 - C121/122 - R121/122 - IC501(93/94)				
BELL DETECTION	CN101(TEL LINE) - L101/L102 - R111/R112 - C111/C112 - Q111 - IC501(58)				

Note:

☐: inside of Handset

RF part signal route

SIGNAL ROUTE	IN	→	ROUTE	→	OUT
HANDSET RF [TX_ROUTE]	< R747 - R751 - IC701(27 - 1) - L751 - C716 - IC801(17 - 2) - FL811 - R813 - IC851(18 - 5) - C881 - FL881 >				
HANDSET RF [RX_ROUTE]	< FL881 - C881 - IC851(5 - 12) - C824 - R823 - FL821 - C821 - IC801(5 - 15) - C725 - R724 - C722 - IC701(4 - 16) >				
BASE UNIT RF [TX_ROUTE]	< R747 - R751 - IC701(27 - 1) - L751 - C716 - IC801(17 - 2) - R813 - IC851(18 - 5/2) - C881/C891 - FL881/FL891>				
BASE UNIT RF [RX_ROUTE]	< FL881/FL891 - C881/C891 - IC851 (5/2 - 12) - C824 - R823 - FL821 - C821 - IC801(5 - 15) - C725 - R724 - C722 - IC701(4 - 16) >				

Note:

☐: inside of Handset

19 CPU DATA (BASE UNIT)

19.1. IC501

PIN	Description	I/O	High	High_Z	Low
1	GNDPA	GND	--	--	--
2	SPOUTP	A.O	--	--	--
3	BMCCLK	A.O	--	--	--
4	TXMOD	A.O	--	--	--
5	RSSI	A.I	--	--	--
6	XIN	A.I	--	--	--
7	XOUT	A.O	--	--	--
8	VDD	D.O	--	--	--
9	VCCIN	VCC	--	--	--
10	GND	GND	--	--	GND
11	RSTN	D.I	Normal	--	Reset
12	NC	D.O	--	--	--
13	NC	D.O	--	--	--
14	NC	D.O	--	--	--
15	NC	D.O	--	--	--
16	NC	D.O	--	--	--
17	SYN_OUT	D.I	High	--	Low
18	TX_DATA	D.O	High	--	Low
19	PA_CONT	D.O	Low Power	--	High Power
20	SYN_LE2	D.O	Not	--	Active
21	AC_DOWN_DET	D.I	High	--	Low
22	RF_RST	D.O	Normal	--	WakeUp
23	RADIO_EN	D.O	Active	--	Not
24	SHCTRL	D.O	Active	--	Not
25	ANT0	D.O	On	--	Off
26	GND	GND	--	--	GND
27	VCC	VCC	VCC	--	--
28	SYN_LE1	D.O	Not	--	Active
29	SYN_CLK	D.O	High	--	Low
30	SYN_DATA	D.O	High	--	Low
31	RXEN	D.O	Active	--	Off
32	TXEN	D.O	Active	--	Off
33	RXGAIN	D.O	High	--	Low
34	RXI	D.I	High	--	Low
35	NC	D.O	--	--	--
36	NC	D.O	--	--	--
37	NC	D.O	--	--	--
38	NC	D.O	--	--	--
39	NC	D.O	--	--	--
40	NC	D.O	--	--	--
41	NC	D.O	--	--	--
42	EROM_DATA	D.I.O	High	--	Low
43	EROM_CLK	D.O	High	--	Low
44	EROM_WP	D.O	WP	--	Write
45	NC	D.O	--	--	--
46	GND	GND	--	--	GND
47	VCC	VCC	VCC	--	--
48	NC(INT0)	D.O	--	--	--
49	NC	D.O	--	--	--
50	NC	D.O	--	--	--
51	NC	D.O	--	--	--
52	NC	D.O	--	--	--
53	KEY_STB_C	D.O	Active	Not	--
54	KEY_STB_B	D.O	Active	Not	--
55	KEY_STB_A	D.O	Active	Not	--
56	LINE_SZ	D.O	On	--	Off
57	NOT_RLY	D.O	On Hook	--	Off Hook
58	BELL	D.I	OFF	--	ON
59	RLY	D.O	Off Hook	--	On Hook
60	NC	D.O	--	--	--
61	NC	D.O	--	--	--
62	NC	D.O	--	--	--

PIN	Description	I/O	High	High_Z	Low
63	KEY_IN3	D.I	Non	--	Key In
64	KEY_IN2	D.I	Non	--	Key In
65	KEY_IN1	D.I	Non	--	Key In
66	GND	GND	--	--	GND
67	VCC	VCC	VCC	--	--
68	TCK	D.O	--	--	--
69	TMS	D.I	--	--	--
70	TDI	D.O	--	--	--
71	TD0	D.O	--	--	--
72	NC	D.O	--	--	--
73	CHG_DET	D.I	Off Charge	--	On Charge
74	NC	D.O	--	--	--
75	NC	D.O	--	--	--
76	NC	D.O	--	--	--
77	NC(INT1)	D.O	--	--	--
78	CHG_LED	D.I.O	--	Off	On
79	INUSE_LED	D.I.O	--	Off	On
80	NC	D.O	--	--	--
81	UART_TX	D.O	High	--	Low
82	UART_RX	D.I	High	--	Low
83	NC	D.O	--	--	--
84	GND	GND	--	--	GND
85	PDN	A.I	--	--	--
86	IBAT	A.I	--	--	--
87	VREF	A.O	--	--	--
88	MIP	A.I	--	--	--
89	MIN	A.I	--	--	--
90	DCIN2	A.I	--	--	--
91	NC	A.O	--	--	--
92	GNDA	GND	--	--	--
93	HSMIP	A.I	--	--	--
94	HSMIN	A.I	--	--	--
95	VCCA	VCC	--	--	--
96	Headset_MIC_in	A.I	--	--	--
97	LOUT0	A.O	--	--	--
98	HSSPOUT	A.O	--	--	--
99	VCCPA	VCC	--	--	--
100	SPOUTN	A.O	--	--	--

20 CPU DATA (HANDSET)

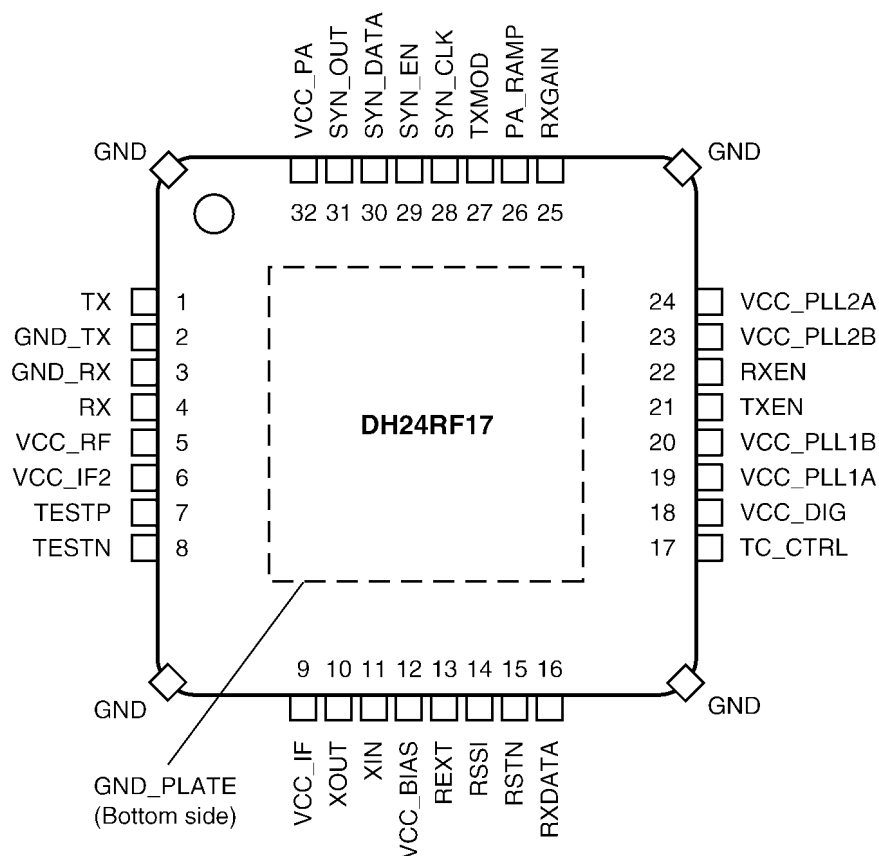
20.1. IC201

PIN	Description	I/O	High	High_Z	Low
1	GNDPA	GND	--	--	GND
2	SPOUTP	A.O	--	--	--
3	BCLK	A.O	--	--	--
4	RSSI	A.I	--	--	--
5	XIN	A.I	--	--	--
6	XOUT	A.O	--	--	--
7	VDD	VDD	--	--	--
8	VCCIN	VCC	VCC	--	--
9	GND	GND	--	--	GND
10	DCDCGND	GND	--	--	GND
11	DCDCIN	A.I	--	--	--
12	DCDCOUT	A.O	--	--	--
13	RSTN	D.I	Normal	--	Reset
14	(FLASH_RESET)	D.O	--	--	Normal
15	(FLASH_SO)	D.O	--	--	Normal
16	(FLASH_SI)	D.O	High	--	Low
17	(FLASH_CS)	D.O	--	--	Normal
18	BL LED	D.O	Off	--	On
19	SERIAL DI	D.I	High	--	Low
20	TX OUT	D.O	High	--	Low
21	PA_CONT	D.O	High	--	Low
22	SYN_LE2	D.O	On	--	Off
23	CON_EN	D.O	High	--	Low
24	RF_RESET	D.O	Normal	--	Reset
25	NC	D.O	--	--	Normal
26	SHCTRL	D.O	On	--	Off
27	HEADSET_DET	D.I	Headset In	--	Non
28	GND	GND	--	--	GND
29	VCC	VCC	VCC	--	--
30	SERIAL_LE	D.O	High	--	Low
31	SERIAL_CLK	D.O	High	--	Low
32	SERIAL DATA	D.I	High	--	Low
33	RXEN	D.O	Active	--	Off
34	TXEN	D.O	Active	--	Off
35	RXGAIN	D.O	High	--	Low
36	RXI	D.I	--	--	--
37	NC	D.O	--	--	Normal
38	CHARGE_DET	D.I	Off Charge	--	On Charge
39	NC	D.O	--	--	Normal
40	NC	D.O	--	--	Normal
41	NC	D.O	--	--	Normal
42	NC	D.O	--	--	Normal
43	NC	D.O	--	--	Normal
44	DOT_LCD_D4	D.O	High	--	Low
45	DOT_LCD_D5	D.O	High	--	Low
46	DOT_LCD_D6	D.O	High	--	Low
47	DOT_LCD_D7	D.O	High	--	Low
48	GND	GND	--	--	GND
49	VCC	VCC	VCC	--	--
50	DOT_LCD_RESET	D.O	Normal	--	Reset
51	(FLASH_SCK)	D.O	High	--	Low
52	NC(INT0)	D.O	--	--	Normal
53	NC	D.O	--	--	Normal
54	NC	D.O	--	--	Normal
55	NC	D.O	--	--	Normal
56	DOT_LCD_RS	D.O	Data	--	Instruct
57	DOT_LCD_RW_WR	D.O	Read	--	Write
58	DOT_LCD_E_RD	D.O	Active	--	Not

PIN	Description	I/O	High	High_Z	Low
59	DOT_LCD_POWER_SW	D.O	On	--	Off
60	ANT_LED1	D.O	Off	--	On
61	ANT_LED2	D.O	Off	--	On
62	ANT_LED3	D.O	Off	--	On
63	KEYSTROBE_E	D.O	--	Not	Active
64	KEYSTROBE_D	D.O	--	Not	Active
65	KEYSTROBE_C	D.O	--	Not	Active
66	KEYSTROBE_B	D.O	--	Not	Active
67	KEYSTROBE_A	D.O	--	Not	Active
68	GND	GND	--	--	GND
69	VCC	VCC	VCC	--	--
70	TEST_CLK	D.I	--	--	--
71	TEST_MODE_SELECT	D.I	--	--	--
72	TEST_DATA_IN	D.I	--	--	--
73	TEST_DATA_OUT	D.O	--	--	--
74	KEYIN1	D.I	Non	--	Key In
75	KEYIN2	D.I	Non	--	Key In
76	KEYIN3	D.I	Non	--	Key In
77	KEYIN4	D.I	Non	--	Key In
78	KEYIN5	D.I	Non	--	Key In
79	NC(INT1)	D.O	--	--	Normal
80	CHARGE_CNT	D.O	Trickle	--	Normal
81	EEPROM_CLK	D.O	High	--	Low
82	EEPROM_DATA	D.I.O	High	--	Low
83	UART_TX	D.O	High	--	Low
84	UART_RX	D.I	High	--	Low
85	EEPROM_WP	D.O	WP	--	Write
86	GND	GND	--	--	GND
87	PDN	A.I	--	--	--
88	Battlow	A.I	--	--	--
89	VREF	A.O	--	--	--
90	MIP	A.I	--	--	--
91	MIN	A.I	--	--	--
92	DCIN2	A.I	--	--	--
93	GNDA	GND	--	--	GND
94	VCCA	VCC	VCC	--	--
95	Headset_MIC_in	A.I	--	--	--
96	DCIN0	A.I	--	--	--
97	LOUT0	A.O	--	--	--
98	HSSPOUT	A.O	--	--	--
99	VCCPA	VCC	VCC	--	--
100	SPOUTN	A.O	--	--	--

21 EXPLANATION OF IC TERMINALS (RF PART)

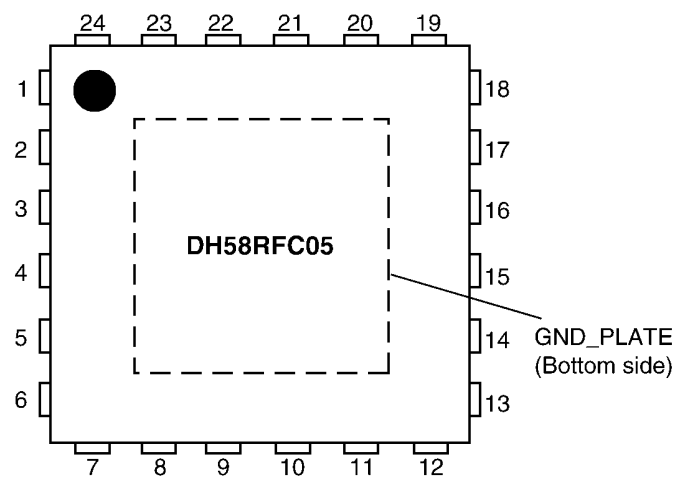
21.1. IC701



Pin	Description	I/O
1	TX	O & VCC
2	GND_TX	GND
3	GND_RX	GND
4	RX	I
5	VCC_RF	VCC
6	VCC_IF2	VCC
7	TESTP	O
8	TESTN	O
9	VCC_IF	VCC
10	XOUT	XI/XO
11	XIN	XI/XO
12	VCC_BIAS	VCC
13	REXT	I
14	RSSI	O
15	RSTN	I
16	RXDATA	O
17	TC_CTRL	I

Pin	Description	I/O
18	VCC_DIG	VCC
19	VCC_PLL1A	VCC
20	VCC_PLL1B	VCC
21	TXEN	I
22	RXEN	I
23	VCC_PLL2B	VCC
24	VCC_PLL2A	VCC
25	RXGAIN	I
26	PA_RAMP	I
27	TXMOD	I
28	SYN_CLK	I
29	SYN_EN	I
30	SYN_DATA	I
31	SYN_OUT	O
32	VCC_PA	VCC
	GND_PLATE	GND

21.2. IC801

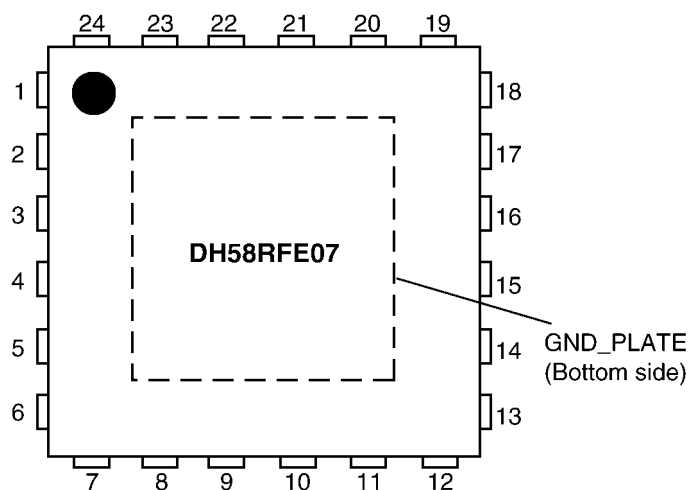


Pin	Description	I/O
1	VCC_PA2	VCC
2	TX	O
3	GND_ISOL1	GND
4	GND_ISOL2	GND
5	RX	I
6	VCC_LNA	VCC
7	REFIN	I
8	REFOUT	O
9	RXGAIN	I
10	CP_OUT	O
11	TV_IN	I
12	VARGND	GND
13	PLL_BYP	O

Pin	Description	I/O
14	VCC_PLL	VCC
15	2G4_OUT	O
16	GND_ISOL3	GND
17	2G4_IN	I
18	VCCTXRX	VCC
19	SYN_CLK	I
20	SYN_EN	I
21	SYN_DATA	I
22	RXEN	I
23	TXEN	I
24	VCC_PA1	VCC
GND_PLATE		GND

Backside Terminal: GND

21.3. IC851



Pin	Description	I/O
1	GND_ISO	GND
2	ANT1	I/O
3 & 4	GND_ISO	GND
5	ANT2	I/O
6	GND_ISO	GND
7	VDD_LNA1	VDD
8	GND_LNA1	GND
9	VDD_LNA2	VDD
10	GND_LNA2	GND
11	NC	-
12	LNA_OUT	O
13	LNA_GAIN	I

Pin	Description	I/O
14	LNA_EN	I
15	ANTSEL_B	I
16	ANTSEL_A	I
17	PA_EN	I
18	PA_IN	I
19	VDD_PA	VDD
20	GND_ISO	GND
21	PA_OUT	VDD/O
22 & 23	GND_ISO	GND
24	TRSW_IN	I
GND_PLATE		GND

Backside Terminal: GND

22 HOW TO REPLACE THE FLAT PACKAGE IC

Even if you do not have the special tools (for example, a spot heater) to remove the Flat IC, with some solder (large amount), a soldering iron and a cutter knife, you can easily remove the ICs that have more than 100 pins.

22.1. Preparation

- PbF (: Pb free) Solder

- Soldering Iron

Tip Temperature of 700°F ± 20°F (370°C ± 10°C)

Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.

- Flux

Recommended Flux: Specific Gravity → 0.82.

Type → RMA (lower residue, non-cleaning type)

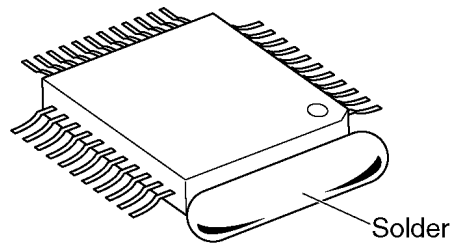
Note: See **ABOUT LEAD FREE SOLDER (PbF: Pb free)** (P.4)

22.2. How to Remove the IC

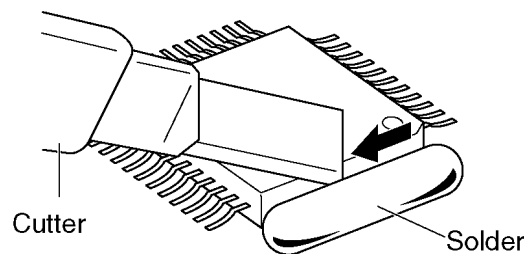
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

Note:

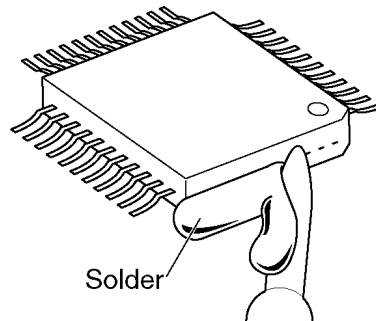
If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



2. Make a few cuts into the joint (between the IC and its pins) first and then cut off the pins thoroughly.



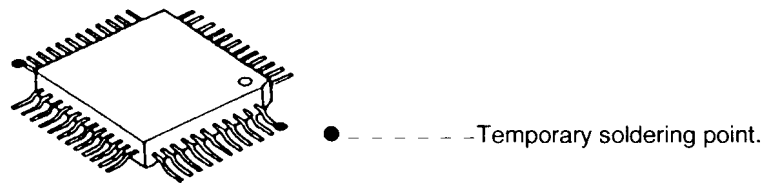
3. While the solder melts, remove it together with the IC pins.



When you attach a new IC to the board, remove all solder left on the land with some tools like a soldering wire. If some solder is left at the joint on the board, the new IC will not be attached properly.

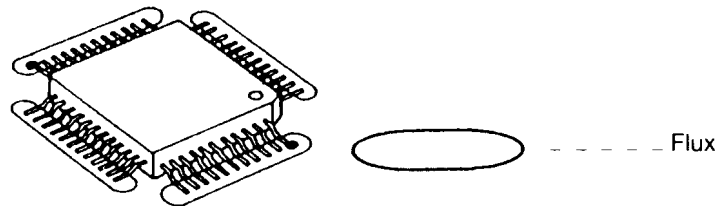
22.3. How to Install the IC

1. Temporarily fix the FLAT PACKAGE IC, soldering the two marked pins.

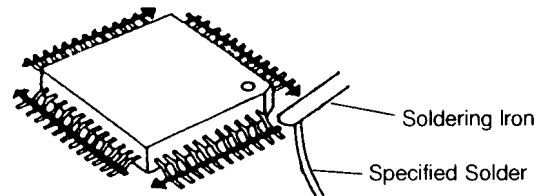


*Check the accuracy of the IC setting with the corresponding soldering foil.

2. Apply flux to all pins of the FLAT PACKAGE IC.

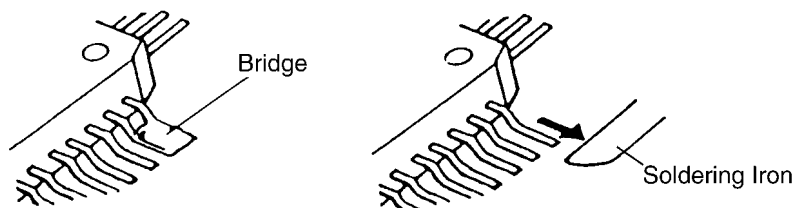


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



22.4. How to Remove a Solder Bridge

1. Lightly resolder the bridged portion.
2. Remove the remaining solder along the pins using a soldering iron as shown in the figure below.



23 HOW TO REPLACE THE LLP (Leadless Leadframe Package) IC

23.1. Preparation

- PbF (: Pb free) Solder
- Soldering Iron

Tip Temperature of 700°F ± 20°F (370°C ± 10°C)

Note:

We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.

- Hot Air Desoldering Tool

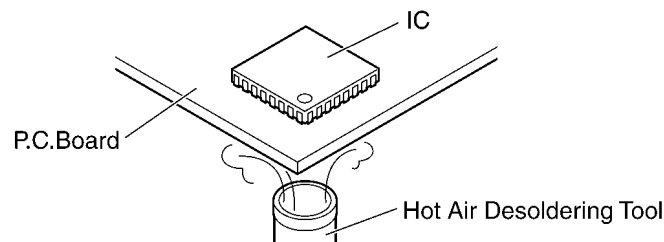
Temperature: 608°F ± 68°F (320°C ± 20°C)

23.2. Caution

- To replace the IC efficiently, choose the right sized nozzle of the hot air desoldering tool that matches the IC package.
- Be careful about the temperature of the hot air desoldering tool not to damage the PCB and/or IC.

23.3. How to Remove the IC

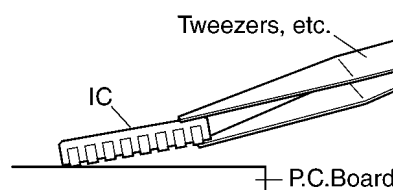
1. Heat the IC with a hot air desoldering tool through the P.C.Board.



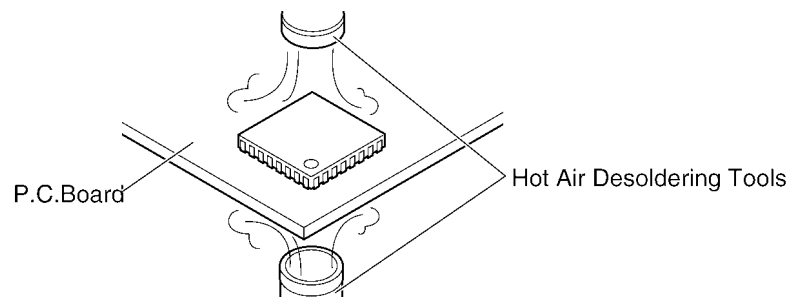
2. Pick up the IC with tweezers, etc. when the solder is melted completely.

Note:

- Be careful not to touch the peripheral parts with tweezers, etc. They are unstable.



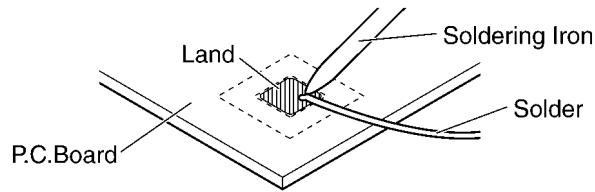
When it is hard to melt the solder completely, heat it with a hot air desoldering tool through the IC besides through the P.C.Board.



3. After removing the IC, clean the P.C.Board of residual solder.

23.4. How to Install the IC

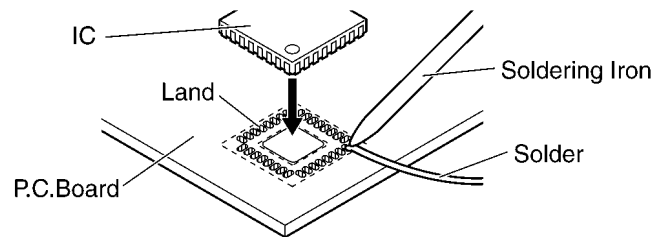
1. Place the solder a little on the land where the radiation GND pad on IC bottom is to be attached.



2. Place the solder a little on the land where IC pins are to be attached, then place the IC.

Note:

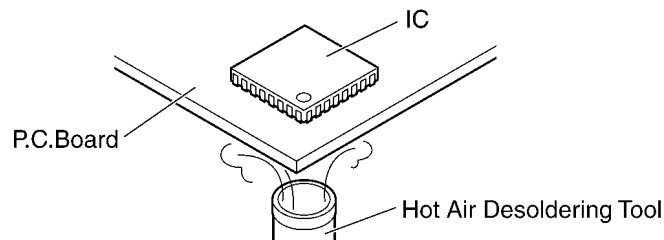
- When placing the IC, the positioning should be done very carefully.



3. Heat the IC with a hot air desoldering tool through the P.C.Board until the solder on IC bottom is melted.

Note:

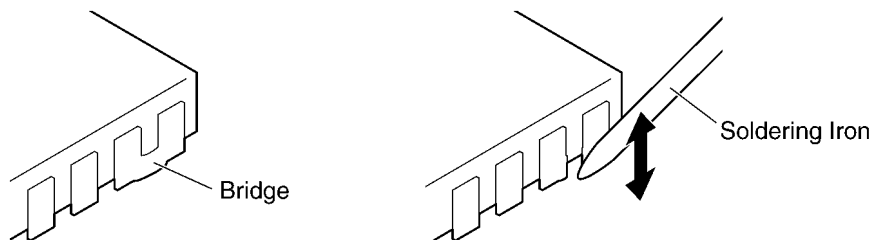
- Be sure to place it precisely, controlling the air volume of the hot air desoldering tool.



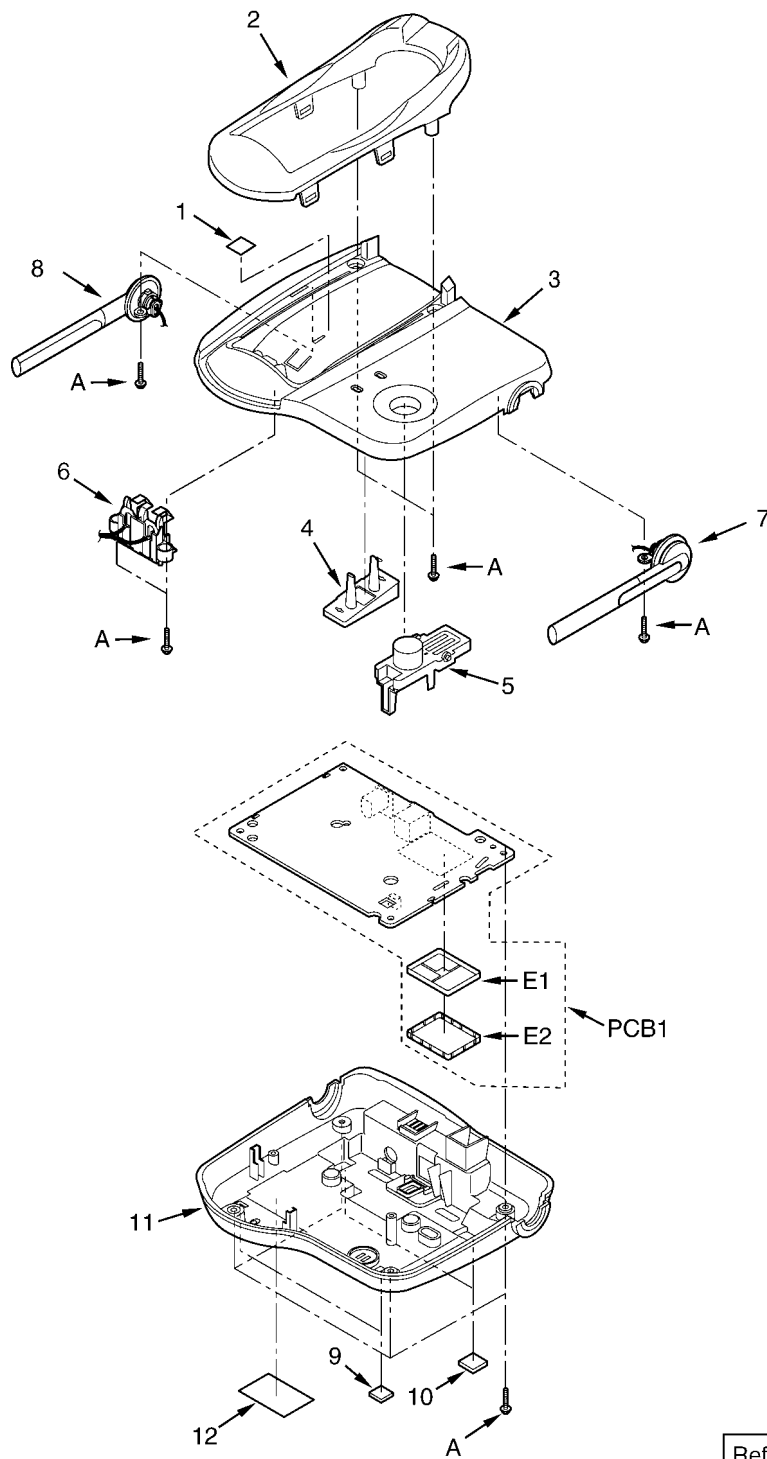
4. After soldering, confirm there are no short and open circuits with visual inspection.

23.5. How to Remove a Solder Bridge

When a Solder Bridge is found after soldering the bottom of the IC, remove it with a soldering iron.

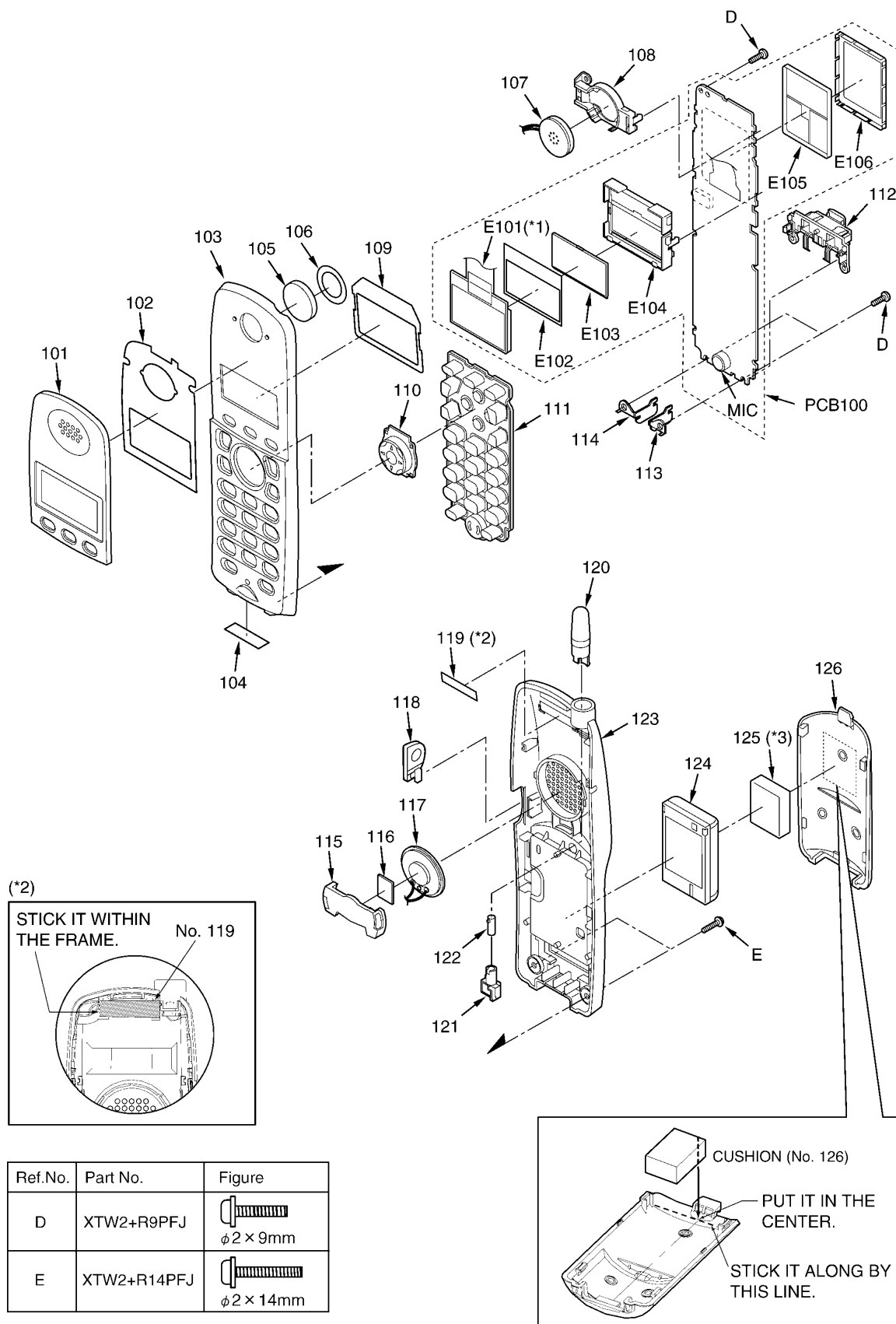


24 CABINET AND ELECTRICAL PARTS (BASE UNIT)



Ref.No.	Part No.	Figure
A	XTW26+T12PFJ	 $\phi 2.6 \times 12\text{mm}$

25 CABINET AND ELECTRICAL PARTS (HANDSET)



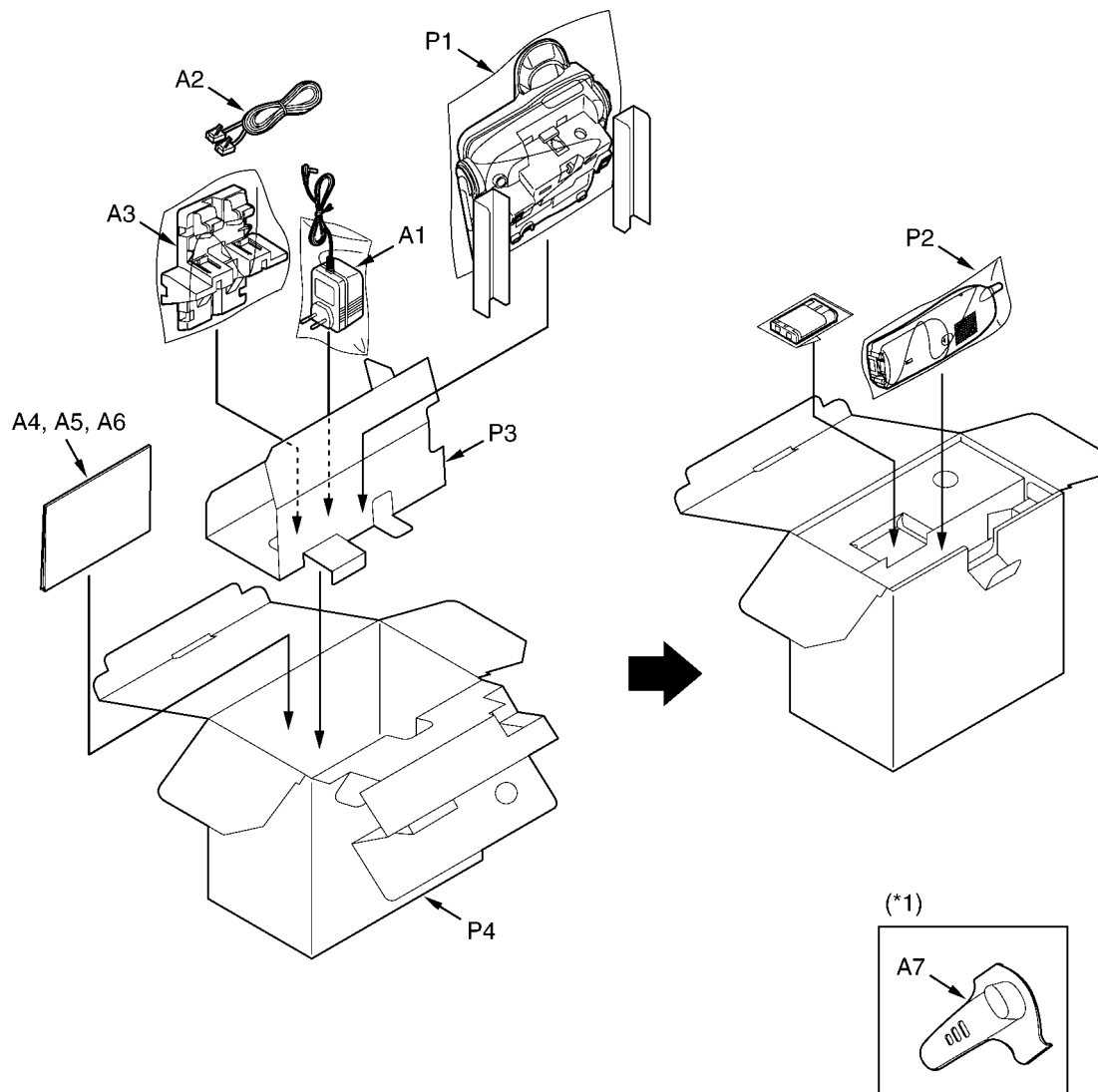
Note:

(*1) This cable is fixed by welding. Refer to "HOW TO REPLACE THE HANDSET LCD" (P.18)

(*2) Stick the magnetic shield (No. 119) to the exact location described above.

(*3) Attach the spacer (No. 125) to the exact location described above.

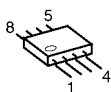
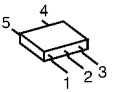
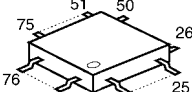
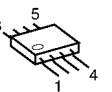
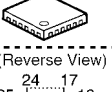
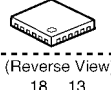
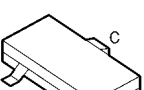
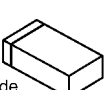
26 ACCESSORIES AND PACKING MATERIALS



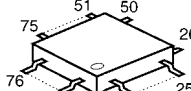
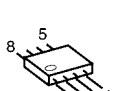
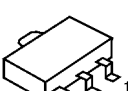
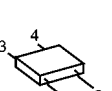
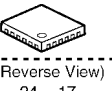
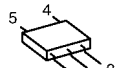
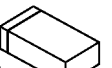
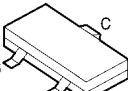
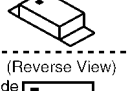
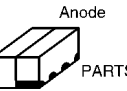
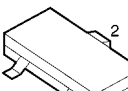
Note:
(*1) for Service

27 TERMINAL GUIDE OF THE ICs, TRANSISTORS AND DIODES

27.1. Base Unit

 C0DBFGD00017	 C0DBAGZ00023 C0CBAAC00083 C0CBABE00029	 C2HBBY000022	 PQWIG5621BXH	 C1CB00001657
 (Reverse View) C1CB00001682 C1CB00002281	 B1CHND000004 2SB1218A 2SD1819A	 B1ADGP000008 2SD0874AS B1BBAP000021	 MA111, MA8220 B0JCME000035 B0ECKM000008	 PQVDMD5S
 PQVDRLZ20A	 PSVD111R820R PQVDHPY1105W			

27.2. Handset

 C2HBBY000029	 PQWIG5621BXR	 C0CBABD00019 C0CBABD00011	 C0EBF0000179	 C1CB00001657
 C0CBAAC00083 C0CBABE00029	 (Reverse View) C1CB00001682 C1CB00002281	 B1GHCFCM0001	 MA111, MA8047, MA2ZD0200L	
 UN521, PQVTDTC143E, 2SD1819A PQVTDTC144TU, 2SB1197KQ PQVTDTC123JU		 (Reverse View) B3ACB0000115	 B3AZB0000032	 MA132WK

28 REPLACEMENT PARTS LIST

Note:

1. RTL (Retention Time Limited)

The marking (RTL) indicates that the Retention Time is limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability depends on the type of assembly and the laws governing parts and product retention.

At the end of this period, the assembly will no longer be available.

2. Important safety notice

Components identified by the Δ mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.

3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.

4. ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.

5. RESISTORS & CAPACITORS

Unless otherwise specified;

All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω

All capacitors are in MICRO FARADS (μ F) P= μ F

*Type & Wattage of Resistor

Type

ERC:Solid	ERX:Metal Film	PQ4R:Chip
ERDS:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
ERJ:Chip	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W
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*Type & Voltage Of Capacitor

Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,F1K,ECUV: Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG: Polyester
ECUV,PQCUV, ECUE:Chip	ECEA,ECST,EEE:Electlytic
ECQMS:Mica	ECQP: Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others		
1H:50V	05:50V	0F:3.15V	0J :6.3V	1V :35V	
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V	
2E:250V	2:200V	1V:35V	1C :16V	1J :16V	
2H:500V		0J:6.3V	1E,25:25V	2A :100V	

28.1. Base Unit

28.1.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQQT23193Z	LABEL, CHARGE	
2	PQGG10278U5	GRILLE, CRADLE	PC-HB
3	PQKM10661Y1	CABINET BODY	PS-HB
4	PQHR11097Z	OPTIC CONDUCTIVE PARTS, LED LENDS	PS-HB
5	PQBC10481Z1	BUTTON, LOCATOR	
6	PQWE10037Z	BATTERY TERMINAL	PS-HB
7	PQSA10157V	ANTENNA (R)	
8	PQSA10158V	ANTENNA (L)	
9	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	

Ref. No.	Part No.	Part Name & Description	Remarks
10	PQHA10017Z	RUBBER PARTS, LEG CUSHION	
11	PQKF10660Y1	CABINET COVER	PS-HB
12	PQGT18847Z	NAME PLATE	

28.1.2. Main P.C. Board Parts

Note:

(*1) When you have replaced IC501 or IC611, adjust X501.

Refer to **Check and Adjust X501 (Base Unit) Frequency** (P.38).

(*2) When replacing IC701, IC801 or IC851, refer to **HOW TO REPLACE THE LLP (Leadless Leadframe Package) IC** (P.76).

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWPG5621BXH	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICs)	
IC300	C0DBAGZ00023	IC	S
IC331	C0DBFGD00017	IC	
IC501	C2HBBY000022	IC (*1)	
IC611	PQWIG5621BXH	IC (*1)	
IC701	C1CB00001657	IC (*2)	
IC761	C0CBAAC00083	IC	
IC801	C1CB00001682	IC (*2)	
IC841	C0CBABE00029	IC	
IC851	C1CB00002281	IC (*2)	
		(TRANSISTORS)	
Q111	2SD1819A	TRANSISTOR(SI)	
Q141	B1ADGP000008	TRANSISTOR(SI)	
Q142	B1BBAP000021	TRANSISTOR(SI)	S
Q161	2SD0874AS	TRANSISTOR(SI)	
Q171	2SD1819A	TRANSISTOR(SI)	
Q300	B1CHND000004	TRANSISTOR(SI)	
Q361	2SB1218A	TRANSISTOR(SI)	
Q362	2SD1819A	TRANSISTOR(SI)	
Q535	2SD1819A	TRANSISTOR(SI)	
		(DIODES)	
D101	PQVDMDS5	DIODE(SI)	
D113	MA111	DIODE(SI)	S
D133	MA111	DIODE(SI)	S
D142	PQVDRLZ20A	DIODE(SI)	S
D300	B0JCME000035	DIODE(SI)	
D301	B0JCME000035	DIODE(SI)	
D361	MA8220	DIODE(SI)	S
D362	B0ECKM000008	DIODE(SI)	
LED677	PQVDHPY1105W	LED	
LED679	PSVD111R820R	LED	S
		(COILS)	
L101	PQLQXF330K	COIL	S
L102	PQLQXF330K	COIL	S
L300	G1C220M00037	COIL	S
L361	G1C6R8MA0072	COIL	
L501	PQLQR2KA213	COIL	S
L711	MQLRF18NJFB	COIL	
L782	G1C1R0KA0096	COIL	
L871	MQLRF3N3DFB	COIL	
C723	MQLRF2N7DFB	COIL	
		(JACKS)	
CN101	K2LB102B0053	JACK	S
CN301	PQJJ1B4Y	JACK	S
		(LCR FILTERS)	
FL811	J0E5797B0001	LCR FILTER	
FL821	KNCFH165R8Z1	LCR FILTER	
FL881	J0E5797B0002	LCR FILTER	
FL891	J0E5797B0002	LCR FILTER	
		(COMPONENTS PARTS)	
RA500	D1H810440003	RESISTOR ARRAY	
RA501	D1H84724A013	RESISTOR ARRAY	

Ref. No.	Part No.	Part Name & Description	Remarks
		(VARISTORS)	
SA101	J0LE00000047	VARISTOR (SURGE ABSORBER)	S
SA104	J0LE00000047	VARISTOR (SURGE ABSORBER)	S
		(RESISTORS)	
R111	ERJ3GEYJ104	100K	
R112	ERJ3GEYJ104	100K	
R113	ERJ3GEYJ103	10K	
R114	ERJ3GEYJ473	47K	
R121	ERJ3GEYJ394	390K	
R122	ERJ3GEYJ394	390K	
R131	ERJ3GEYJ106	10M	
R133	ERJ3GEYJ105	1M	
R134	ERJ3GEYJ102	1K	
R141	ERJ3GEYJ104	100K	
R142	ERJ3GEYJ103	10K	
R143	ERJ3GEYJ103	10K	
R145	ERJ2GEJ103	10K	
R151	ERJ3GEYJ106	10M	
R152	ERJ3GEYJ395	3.9M	
R154	ERJ3GEYJ102	1K	
R160	ERJ3GEYJ751	750	
R162	ERJ3GEYJ393	39K	
R163	ERJ12YJ330	33	
R164	ERJ3GEYJ470	47	
R165	ERJ3GEYJ561	560	
R167	ERJ2GEJ102	1K	
R168	ERJ3GEY0R00	0	
R171	ERJ2GEJ220	22	
R172	ERJ2GEJ104	100K	
R175	ERJ3GEYJ561	560	
R176	ERJ2GEJ101	100	
R178	ERJ2GEJ102	1K	
R183	ERJ2GEJ222	2.2K	
R185	ERJ3GEYJ333	33K	
R303	ERJ3GEYJ221	220	
R304	ERJ3GEYJ221	220	
R308	ERJ3GEYJ121	120	
R361	ERJ3GEYJ332	3.3K	
R362	ERJ3GEYJ473	47K	
R364	ERJ3GEYJ103	10K	
R365	ERJ3GEYJ102	1K	
R371	ERJ1TYJ680	68	
R372	ERJ1TYJ680	68	
R373	ERJ1TYJ680	68	
R421	ERJ2GEJ473	47K	
R422	ERJ2GEJ102	1K	
R423	ERJ2GEJ102	1K	
R517	ERJ2GEJ100	10	
R533	ERJ2GEJ472X	4.7K	
R535	ERJ2GEJ102	1K	
R536	ERJ2GEJ222	2.2K	
R537	ERJ3GEYJ102	1K	
R538	ERJ2GEJ472X	4.7K	
R611	ERJ2GEJ102	1K	
R612	ERJ2GEJ103	10K	
R677	ERJ2GEJ221	220	
R679	ERJ2GEJ821	820	
R701	ERJ2RKF103X	10K	
R732	ERJ2GEJ100	10	
R733	ERJ2GEJ100	10	
R735	ERJ2GEJ4R7	4.7	
R742	ERJ2GEJ331	330	
R744	ERJ2GEJ102	1K	
R747	ERJ2GEJ102	1K	
R751	ERJ2GEJ102	1K	
R752	ERJ2GEJ102	1K	
R809	ERJ2GEJ561	560	
R813	ERJ2GE0R00	0	
R822	ERJ2GEJ271	270	
R823	ERJ2GEJ180	18	
R824	ERJ2GEJ271	270	
R832	ERJ2GEJ562X	5.6K	
R834	ERJ2GEJ332	3.3K	

Ref. No.	Part No.	Part Name & Description	Remarks
R865	ERJ2GEJ271	270	
		(CAPACITORS)	
C101	F1K2J681A006	680P	S
C102	F1K2J681A006	680P	S
C111	F1J2A473A024	0.047	
C112	F1J2A473A024	0.047	
C113	PQCUV1A684KB	0.68	S
C120	ECUV1H102KBV	0.001	
C121	ECUV1H681JCV	680P	S
C122	ECUV1H681JCV	680P	S
C132	ECUV1H103KBV	0.01	
C142	ECUV1H103KBV	0.01	
C152	ECUV1H103KBV	0.01	
C161	EEE1EA100WR	10	
C162	ECUV1H101JCV	100P	
C163	ECUV1H472KBV	0.0047	
C165	ECUV1C473KBV	0.047	
C166	EEE1CA100SR	10	
C167	ECUV1A224KBV	0.22	
C172	F1G1H272A571	0.0027	
C176	EEE0JA220SR	22	
C178	ECUE1A333KBQ	0.033	S
C184	ECJ0EB1A473K	0.047	
C185	ECJ0EB1C183K	0.018	
C300	EEEFK1C470P	47	
C303	ECUV1H103KBV	0.01	
C304	ECUV1A105KBV	1	
C305	ECUV1H103KBV	0.01	
C306	F2G1E1010011	100	S
C308	ECUV1E104KBV	0.1	
C331	ECUV1C474KBV	0.47	
C332	ECUV1A105KBV	1	
C341	EEE0JA331P	330	
C342	ECUV1A105KBV	1	
C347	ECJ0EB1A104K	0.1	
C352	ECUV1C104KBV	0.1	
C361	ECJ0EB1H102K	0.001	
C381	ECUV1A105KBV	1	
C382	F1K0J1060020	10	
C422	ECJ0EB1A104K	0.1	
C501	ECUV1C104KBV	0.1	
C503	ECUV1C104KBV	0.1	
C504	ECUV1C104KBV	0.1	
C508	F1G1H8R0A420	8P	
C509	F1G1H8R0A420	8P	
C513	ECUV1C104KBV	0.1	
C515	ECUV1A105KBV	1	
C516	ECST0JY106	10	S
C517	ECUV1C104KBV	0.1	
C518	ECUV1A106ZF	10	S
C521	ECJ0EB1A104K	0.1	
C531	ECUV1C104KBV	0.1	
C538	ECJ0EB1A104K	0.1	
C611	ECJ0EB1A104K	0.1	
C612	ECUE1H101JCQ	100P	S
C660	ECUV1C104KBV	0.1	
C701	PQCUV0J475MB	4.7	
C702	ECJ0EB1A104K	0.1	
C704	ECJ0EB1H102K	0.001	
C705	ECJ0EC1H100D	10P	
C706	ECJ0EB1C103K	0.01	
C707	ECJ0EB1H102K	0.001	
C708	ECJ0EC1H1R5C	1.5	
C711	ECJ0EC1H010C	1P	
C712	ECJ0EC1H020C	2P	
C713	ECJ0EC1H100D	10P	
C714	ECJ0EB1H102K	0.001	
C715	ECJ0EC1H050C	5P	
C716	ECJ0EC1H020C	2P	
C722	ECJ0EC1H020C	2P	
C725	ECJ0EC1H050C	5P	
C731	ECJ0EB1C103K	0.01	
C732	ECJ0EB1H102K	0.001	

Ref. No.	Part No.	Part Name & Description	Remarks
C733	ECJ0EB1H102K	0.001	
C734	ECJ0EB1H102K	0.001	
C735	ECJ0EB1A104K	0.1	
C737	ECJ0EB1H102K	0.001	
C741	ECJ0EB1H222K	0.0022	
C743	ECJ0EC1H221J	220P	
C745	ECJ0EC1H101J	100P	
C746	ECJ0EC1H101J	100P	
C747	ECJ0EC1H100D	10P	
C748	ECJ0EC1H101J	100P	
C749	ECJ0EC1H101J	100P	
C750	ECJ0EC1H101J	100P	
C751	ECJ0EC1H100D	10P	
C752	ECJ0EB1H471K	470P	
C763	ECUV1A474KBV	0.47	
C764	ECJ0EC1H020C	2P	
C773	ECJ0EC1H101J	100P	
C781	ECJ0EB1A104K	0.1	
C782	ECJ0EC1H121J	120P	
C801	ECJ0EC1H030C	3P	
C802	ECJ0EC1H220J	22P	
C803	ECJ0EB1C103K	0.01	
C804	ECJ0EC1H150J	15P	
C806	ECJ0EC1H100D	10P	
C809	ECUE1A333KBQ	0.033	S
C811	ECJ0EC1H020C	2P	
C821	ECJ0EC1H100D	10P	
C824	ECJ0EC1H100D	10P	
C832	ECJ0EC1H221J	220P	
C833	ECJ0EC1H101J	100P	
C834	ECJ0EB1C103K	0.01	
C835	ECJ0EB1H471K	470P	
C836	ECUV1A105KBV	1	
C837	ECJ0EC1H101J	100P	
C842	ECUV1A105KBV	1	
C843	ECUV1A474KBV	0.47	
C844	ECJ0EC1H020C	2P	
C856	ECJ0EC1H020C	2P	
C857	ECJ0EB0J105K	1	
C865	ECUE1A333KBQ	0.033	S
C871	F1G1HR10A561	1P	
C873	ECJ0EC1H020C	2P	
C874	ECJ0EB0J105K	1	
C881	ECJ0EC1H050C	5P	
C891	ECJ0EC1H050C	5P	
		(OTHERS)	
E1	PQMC10492Z	MAGNETIC SHIELD, FRAME	
E2	PQMC10491Z	MAGNETIC SHIELD, COVER	
P101	PFRT002	THERMISTOR (POSISTOR)	S
S661	PQSH1A117Z	SPECIAL SWITCH	
X501	H0J138500003	CRYSTAL OSCILLATOR	

28.2. Handset

28.2.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
101	PQGP10274X6	PANEL, LCD	AS-HB
102	PQHS10660Y	TAPE, DOUBLE SIDED (PANEL)	
103	PQKM10729Z1	CABINET BODY	ABS-HB
104	PQGT18848Z	NAME PLATE	
105	PQHS10658Z	SPACER, RECEIVER	
106	PQHG10720Z	RUBBER PARTS, RECEIVER	
107	L0AD02A00023	RECEIVER	
108	PQHR11105Z	GUIDE, RECEIVER	ABS-HB
109	PQHS10670Y	SPACER, CUSHION LCD	
110	PQBC10425Y2	PUSH BUTTON, NAVIGATOR KEY	ABS-HB
111	PQSX10329T	KEYBOARD SWITCH	
112	PQWE10033Z	BATTERY TERMINAL	ABS-HB
113	PQJT10225Z	CHARGE TERMINAL (L)	
114	PQJT10226Z	CHARGE TERMINAL (R)	
115	PQHR10778Z	GUIDE, SP HOLDER	ABS-HB

Ref. No.	Part No.	Part Name & Description	Remarks
116	PQHG10703Z	RUBBER PARTS, SPEAKER	
117	L0AD02A00026	SPEAKER	
118	PQKE10395Z1	COVER, EARPHONE	
119	PQMC10496Z	MAGNETIC SHIELD, ANTENNA	
120	PQKE10394Z2	COVER, LED CAP	PC+ABS-HB
121	PQHR11081Y	GUIDE, LED CAP	ABS-HB
122	PQHR11080Z	OPTIC CONDUCTIVE PARTS, LED LENS	PMMA-HB
123	PQKF10715Z1	CABINET COVER	ABS-HB
124	HHR-P104A	BATTERY	
125	PQHE10160Z	SPACER, BATTERY	
126	PQKK10597Z1	LID, BATTERY COVER	ABS-HB

28.2.2. Main P.C.Board Parts

Note:

(*1) When you have replaced IC201 or IC241, adjust X201.

Refer to **Check and Adjust X201 (Handset) Frequency** (P.38) and **Adjust Battery Low Detector Voltage (Handset)** (P.38).

(*2) When replacing IC701, IC801 or IC851, refer to **HOW TO REPLACE THE LLP (Leadless Leadframe Package) IC** (P.76).

(*3) When replacing the handset LCD, See **HOW TO REPLACE THE HANDSET LCD** (P.18).

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWP65621BXR	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICs)	
IC201	C2HBBY000029	IC (*1)	
IC221	C0EBF0000179	IC	
IC241	PQWIG5621BXR	IC (*1)	
IC371	C0CBABD00019	IC	
IC381	C0CBABD00011	IC	
IC701	C1CB00001657	IC (*2)	
IC761	C0CBAAC000083	IC	
IC801	C1CB00001682	IC (*2)	
IC841	C0CBABE00029	IC	
IC851	C1CB00002281	IC (*2)	
		(TRANSISTORS)	
Q221	2SD1819A	TRANSISTOR(SI)	
Q231	UN521	TRANSISTOR(SI)	S
Q251	PQVTDTC123JU	TRANSISTOR(SI)	S
Q255	B1GHCFFM0001	TRANSISTOR(SI)	S
Q261	B1GHCFFM0001	TRANSISTOR(SI)	S
Q331	PQVTDTC143E	TRANSISTOR(SI)	S
Q361	2SB1197KQ	TRANSISTOR(SI)	S
Q362	2SD1819A	TRANSISTOR(SI)	
Q363	PQVTDTC144TU	TRANSISTOR(SI)	S
		(DIODES)	
D223	MA111	DIODE(SI)	S
D312	MA8047	DIODE(SI)	S
D313	MA8047	DIODE(SI)	S
D323	MA8047	DIODE(SI)	S
D324	MA8047	DIODE(SI)	S
D326	MA8047	DIODE(SI)	S
D327	MA8047	DIODE(SI)	S
D351	MA2ZD0200L	DIODE(SI)	
D352	MA2ZD0200L	DIODE(SI)	
D353	MA2ZD0200L	DIODE(SI)	
D354	MA2ZD0200L	DIODE(SI)	
D363	MA132WK	DIODE(SI)	S
LED251	B3ACB0000115	LED	
LED252	B3ACB0000115	LED	
LED253	B3ACB0000115	LED	
LED254	B3ACB0000115	LED	
LED255	B3ACB0000115	LED	
LED256	B3ACB0000115	LED	
LED257	B3ACB0000115	LED	

Ref. No.	Part No.	Part Name & Description	Remarks
LED261	B3AZB0000032	LED	
		(COILS)	
L326	G1CR47J00005	COIL	
L327	G1CR47J00005	COIL	
L331	PQLQR2KB113T	COIL	S
L332	PQLQR2KB113T	COIL	S
L334	PQLQR2KB113T	COIL	S
L711	MQLRF18NJFB	COIL	
L782	G1C1R0KA0096	COIL	
L871	MQLRF3N3DFB	COIL	
C723	MQLRF2N7DFB	COIL	
		(LCR FILTERS)	
FL811	J0E5797B0001	LCR FILTER	
FL821	KNCFH165R8Z1	LCR FILTER	
FL881	J0E5797B0002	LCR FILTER	
		(COMPONENTS PARTS)	
CA271	F5A424740002	CAPACITOR ARRAY	
CA274	F5A841040004	CAPACITOR ARRAY	
RA201	D1H84724A013	RESISTOR ARRAY	S
RA251	D1H84714A013	RESISTOR ARRAY	S
RA255	EXB28V121JX	RESISTOR ARRAY	
		(RESISTORS)	
R208	ERJ3GEYJ100	10	
R209	ERJ2GEJ104	100K	
R222	ERJ2GEJ223	22K	
R223	ERJ2GEJ224	220K	
R225	ERJ2GEJ102	1K	
R226	ERJ2GEJ223	22K	
R227	ERJ2GEJ104	100K	
R228	ERJ2GEJ104	100K	
R231	ERJ2GEJ223	22K	
R234	ERJ2GEJ103	10K	
R241	ERJ2GEJ103	10K	
R242	ERJ2GEJ102	1K	
R243	ERJ2GEJ274	270K	
R261	ERJ2GEJ470	47	
R262	ERJ2GEJ101	100	
R263	ERJ2GEJ101	100	
R272	D1BB4303A055	430K	
R273	D1BB8203A055	820K	
R312	ERJ2GEJ222	2.2K	
R314	ERJ2GEJ222	2.2K	
R315	ERJ2GEJ222	2.2K	
R317	ERJ2GEJ391	390	
R318	ERJ2GEJ222	2.2K	
R323	ERJ2GEJ220	22	
R324	ERJ2GEJ220	22	
R331	ERJ2GEJ103	10K	
R333	ERJ2GEJ102	1K	
R334	ERJ2GEJ222	2.2K	
R361	ERJ2GEJ473	47K	
R362	ERJ2GEJ102	1K	
R363	ERJ2GEJ473	47K	
R366	ERJ3GEYJ332	3.3K	
R370	ERJ8GEYJ1R2	1.2	
R376	ERJ2GEJ155	1.5M	
R377	ERJ2GEJ225	2.2M	
R378	ERJ2GEJ155	1.5M	
R379	ERJ2GEJ225	2.2M	
R701	ERJ2RKF103X	10K	
R732	ERJ2GEJ100	10	
R733	ERJ2GEJ100	10	
R735	ERJ2GEJ4R7	4.7	
R742	ERJ2GEJ331	330	
R744	ERJ2GEJ102	1K	
R747	ERJ2GEJ102	1K	
R751	ERJ2GEJ102	1K	
R752	ERJ2GEJ102	1K	
R809	ERJ2GEJ102	1K	
R813	ERJ2GE0R00	0	
R822	ERJ2GEJ271	270	
R823	ERJ2GEJ180	18	
R824	ERJ2GEJ271	270	

Ref. No.	Part No.	Part Name & Description	Remarks
R832	ERJ2GEJ562X	5.6K	
R834	ERJ2GEJ332	3.3K	
R864	ERJ2GEJ102	1K	
R865	ERJ2GEJ391	390	
		(CAPACITORS)	
C201	ECJ0EC1H100D	10P	
C202	ECJ0EC1H100D	10P	
C204	ECJ0EB1A104K	0.1	
C206	ECJ0EB1A104K	0.1	
C208	F1J0J10600007	10	
C211	EEE0GA331WP	330	
C212	ECJ0EB1C103K	0.01	
C214	F1J0J10600007	10	
C215	ECJ0EB1A104K	0.1	
C221	ECJ0EB1C103K	0.01	
C222	ECJ0EB1A104K	0.1	
C224	ECJ0EB1A104K	0.1	
C225	ECJ0EB1A104K	0.1	
C226	ECJ0EB1A104K	0.1	
C231	ECJ0EB1A104K	0.1	
C241	ECJ0EB1A104K	0.1	
C242	ECJ0EC1H101J	100P	
C246	ECJ0EB1A104K	0.1	
C262	ECUV1A105KBV	1	
C272	ECUV1C474KBV	0.47	
C273	ECUV1C104KBV	0.1	
C303	ECJ0EB0J105K	1	
C305	ECJ0EB1C103K	0.01	
C306	ECJ0EB1A104K	0.1	
C314	ECJ0EB1C183K	0.018	
C315	ECJ0EB1C183K	0.018	
C316	ECJ0EB1H332K	0.0033	
C317	ECST0JY226	22	
C321	F1H0J335A005	3.3	
C333	ECJ0EB1E682K	0.0068	
C335	ECST0JY226	22	
C340	ECJ0EB1A104K	0.1	
C353	ECUV1H103KBV	0.01	
C371	ECJ0EB1A104K	0.1	
C377	ECJ0EB1A104K	0.1	
C379	ECJ0EB1A104K	0.1	
C381	EEE0JA101SP	100	
C386	ECJ0EB1A104K	0.1	
C701	PQCUV0J475MB	4.7	
C702	ECJ0EB1A104K	0.1	
C704	ECJ0EB1H102K	0.001	
C705	ECJ0EC1H100D	10P	
C706	ECJ0EB1C103K	0.01	
C707	ECJ0EB1H102K	0.001	
C708	ECJ0EC1H1R5C	1.5	
C711	ECJ0EC1H010C	1P	
C712	ECJ0EC1H020C	2P	
C713	ECJ0EC1H100D	10P	
C714	ECJ0EB1H102K	0.001	
C715	ECJ0EC1H050C	5P	
C716	ECJ0EC1H020C	2P	
C722	ECJ0EC1H020C	2P	
C725	ECJ0EC1H050C	5P	
C731	ECJ0EB1C103K	0.01	
C732	ECJ0EB1H102K	0.001	
C733	ECJ0EB1H102K	0.001	
C734	ECJ0EB1H102K	0.001	
C735	ECJ0EB1A104K	0.1	
C737	ECJ0EB1H102K	0.001	
C741	ECJ0EB1H222K	0.0022	
C743	ECJ0EC1H221J	220P	
C745	ECJ0EC1H101J	100P	
C746	ECJ0EC1H101J	100P	
C747	ECJ0EC1H100D	10P	
C748	ECJ0EC1H101J	100P	
C749	ECJ0EC1H101J	100P	
C750	ECJ0EC1H101J	100P	
C751	ECJ0EC1H100D	10P	

Ref. No.	Part No.	Part Name & Description	Remarks
C752	ECJ0EB1H471K	470P	
C763	ECUV1A474KBV	0.47	
C764	ECJ0EC1H020C	2P	
C773	ECJ0EC1H101J	100P	
C781	ECJ0EB1A104K	0.1	
C782	ECJ0EC1H121J	120P	
C801	ECJ0EC1H030C	3P	
C802	ECJ0EC1H220J	22P	
C803	ECJ0EB1C103K	0.01	
C804	ECJ0EC1H150J	15P	
C806	ECJ0EC1H100D	10P	
C809	ECJ0EB1C223K	0.022	
C811	ECJ0EC1H020C	2P	
C821	ECJ0EC1H100D	10P	
C824	ECJ0EC1H100D	10P	
C832	ECJ0EC1H221J	220P	
C833	ECJ0EC1H101J	100P	
C834	ECJ0EB1C103K	0.01	
C835	ECJ0EB1H471K	470P	
C836	ECUV1A105KBV	1	
C837	ECJ0EC1H101J	100P	
C842	ECUV1A105KBV	1	
C843	ECUV1A474KBV	0.47	
C844	ECJ0EC1H020C	2P	
C856	ECJ0EC1H020C	2P	
C857	ECJ0EB0J105K	1	
C858	ECJ0EC1H0R5C	0.5P	
C859	ECJ0EC1H0R5C	0.5P	
C864	F161E562A086	0.0056	
C865	ECUE1A333KBQ	0.033	S
C871	F161HR10A561	0.1P	
C873	ECJ0EC1H020C	2P	
C874	ECJ0EB0J105K	1	
C881	ECJ0EC1H050C	5P	
C891	ECJ0EC1H050C	5P	
		(OTHERS)	
MIC	L0CBAB000052	MICROPHONE	
E101	L5DCBY000002	LIQUID CRYSTAL DISPLAY (*3)	
E102	PQHX11289Z	COVER, LCD COVER SHEET	
E103	PQHR11065Z	TRANSPARENT PLATE, LCD PLATE	PMMA-HB
E104	PQHR11228Z	GUIDE, LCD	ABS-HB
E105	PQMC10492Z	MAGNETIC SHIELD, FRAME	
E106	PQMC10491Z	MAGNETIC SHIELD, COVER	
CN331	K2HD103D0001	JACK	
X201	H0J138500003	CRYSTAL OSCILLATOR	

28.3. Accessories and Packing Materials

Note:

(*1) You can download and refer to the Operating Instructions (Instruction book) on TSN Server.

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLV1BXY	AC ADAPTOR	△
A2	PQJA10075Z	CORD, TELEPHONE	
A3	PQKL10068Z1	STAND, WALL MOUNT	ABS-HB
A4	PQX15175Z	INSTRUCTION BOOK (for English) (*1)	
A5	PQQW15165Z	LEAFLET, QUICK GUIDE (for Arabic)	
A6	PQQW15166Z	LEAFLET, QUICK GUIDE (for Persian)	
A7	PQKE10396Z1	HANGER, BELT CLIP (for Service)	PC+ABS-HB
P1	XZB21X35A03	PROTECTION COVER (for Base Unit)	
P2	XZB10X35A02	PROTECTION COVER (for Handset)	
P3	PQPD10715Z	CUSHION	
P4	PQPK15358Z	GIFT BOX	

28.4. Fixtures and Tools

Note:

When replacing the Handset LCD, See **HOW TO REPLACE THE HANDSET LCD** (P.18).

Part No.	Part Name & Description	Remarks
PQZZ430PIR	TIP OF SOLDERING IRON	
PQZZ430PRB	RUBBER OF SOLDERING IRON	

29 FOR SCHEMATIC DIAGRAM

29.1. Base Unit (SCHEMATIC DIAGRAM (BASE_UNIT_MAIN))

Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

Important Safety Notice:

Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

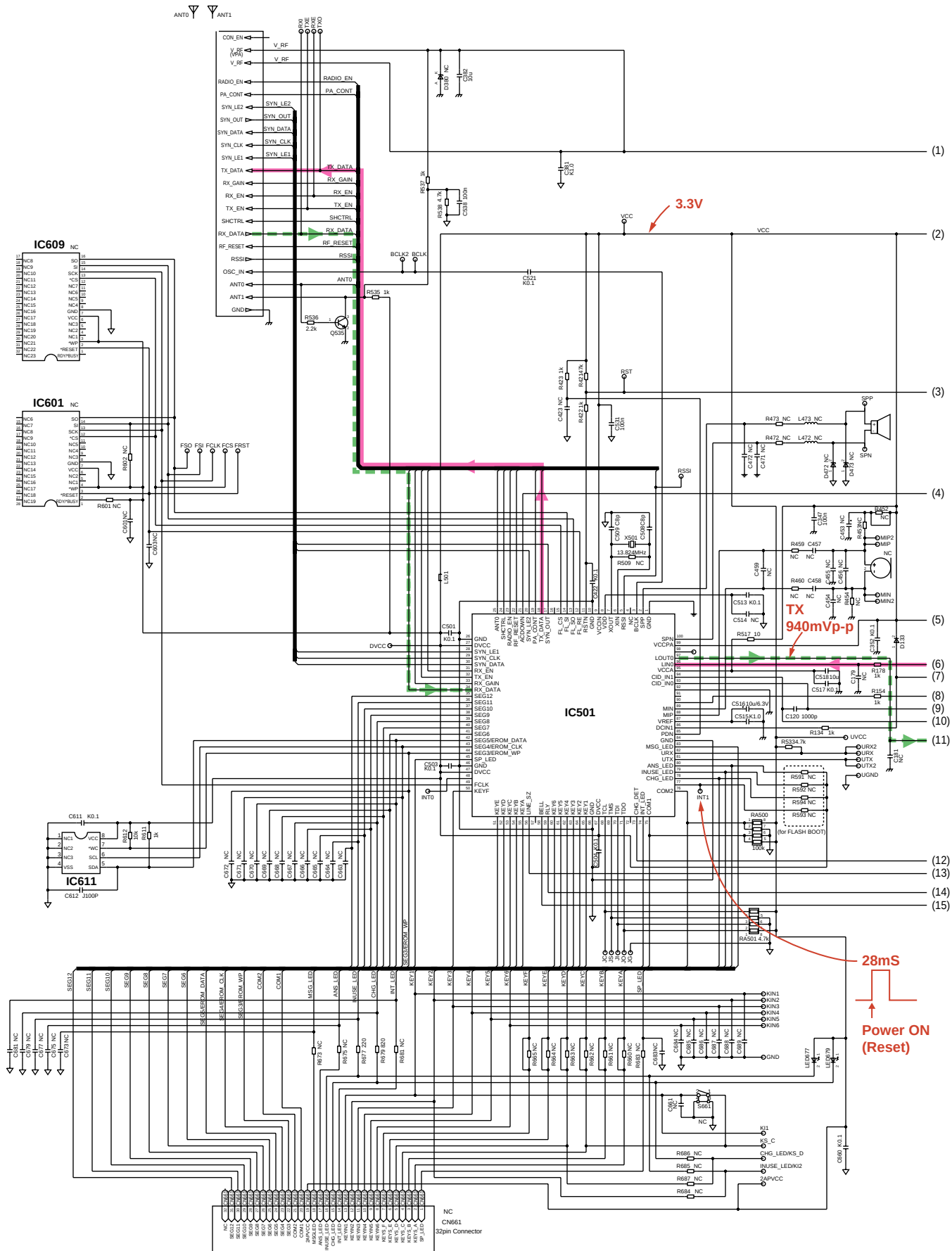
2. This schematic diagrams may be modified at any time with the development of new technology.

29.2. Handset (SCHEMATIC DIAGRAM (HANDSET_MAIN))

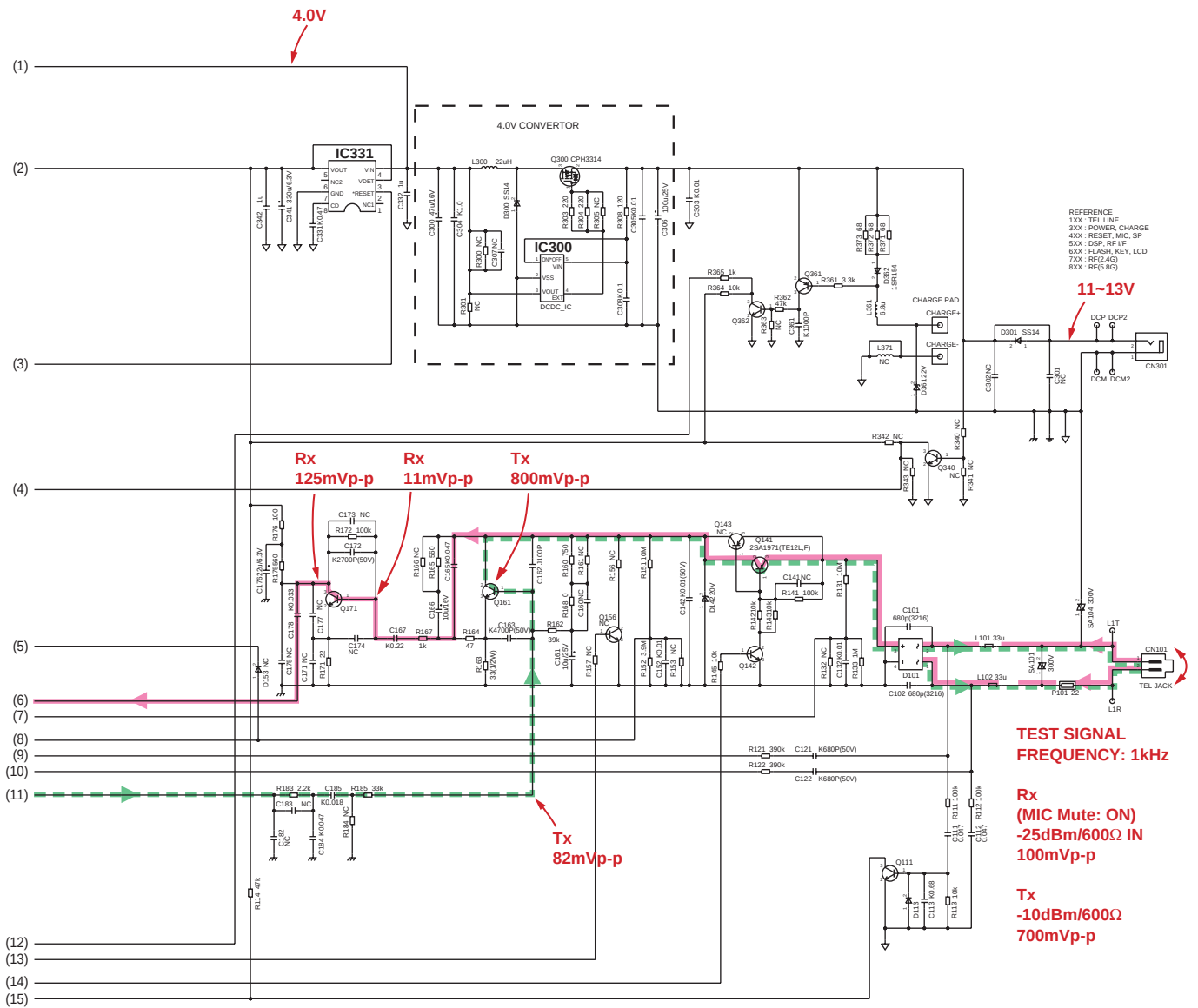
Notes:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams may be modified at any time with the development of new technology.

30 SCHEMATIC DIAGRAM (BASE UNIT_MAIN)

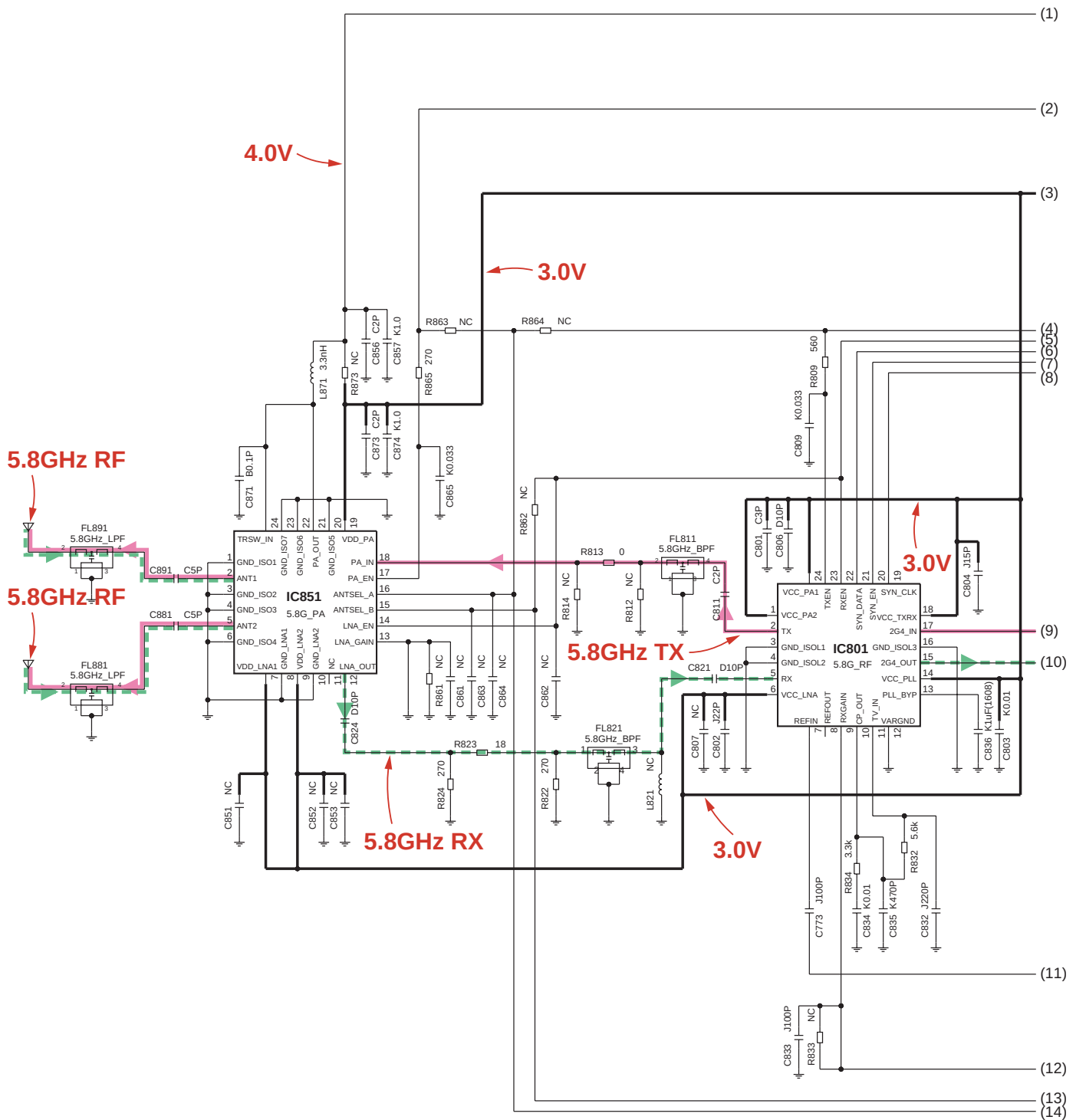


NC: No Components

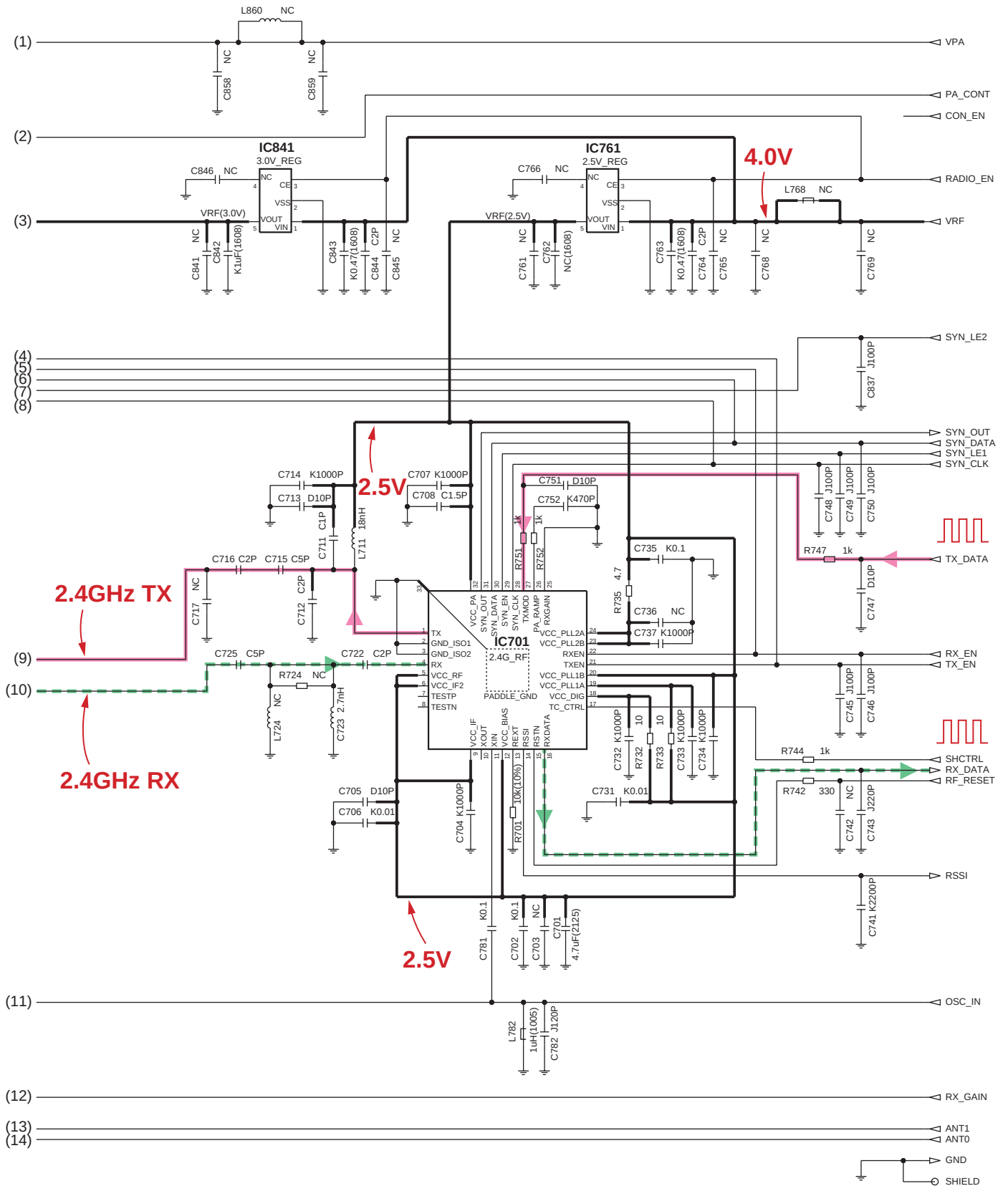


KX-TG5621BX SCHEMATIC DIAGRAM (Base Unit_Main)

31 SCHEMATIC DIAGRAM (BASE UNIT_RF PART)



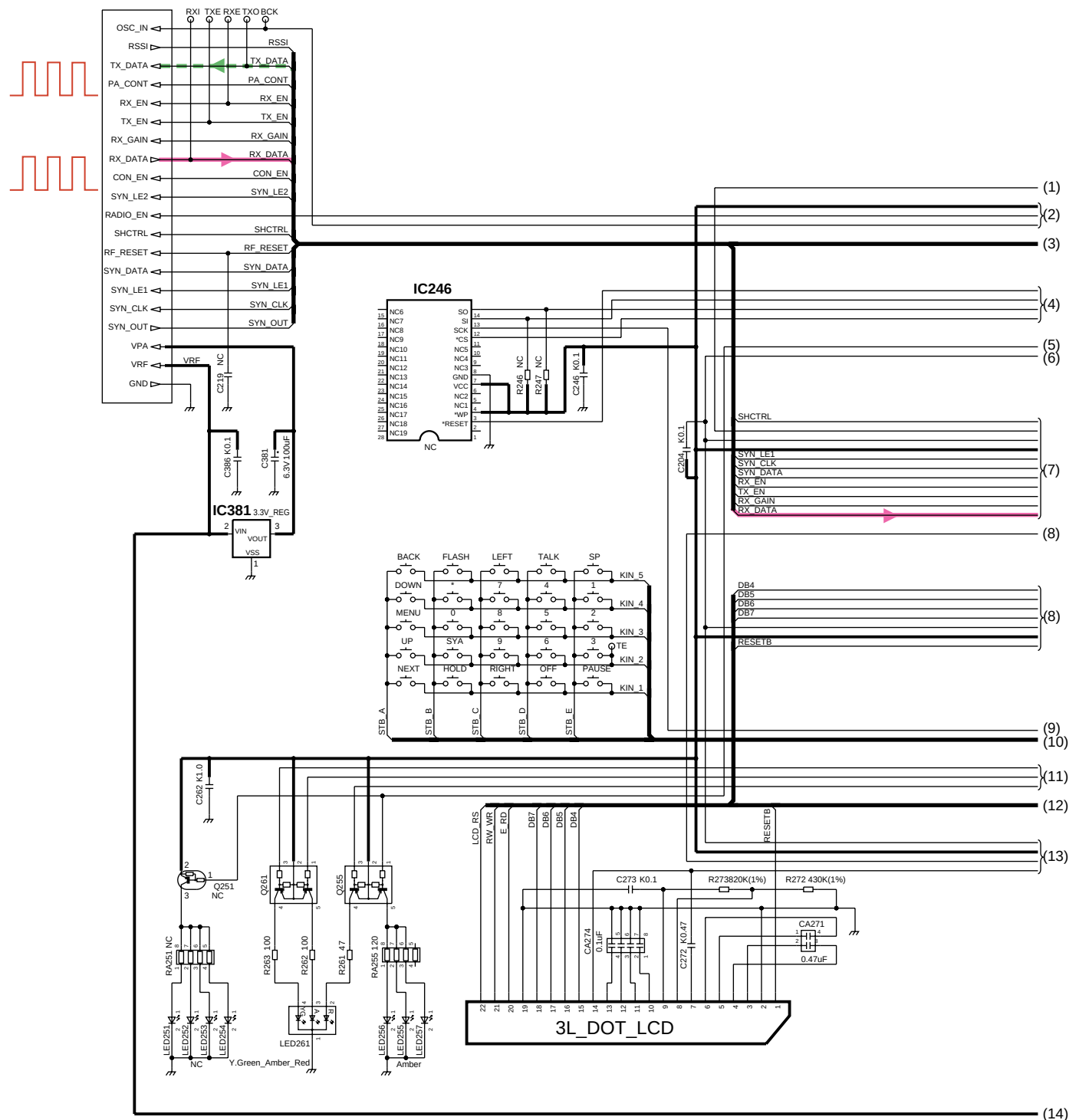
NC: No Components



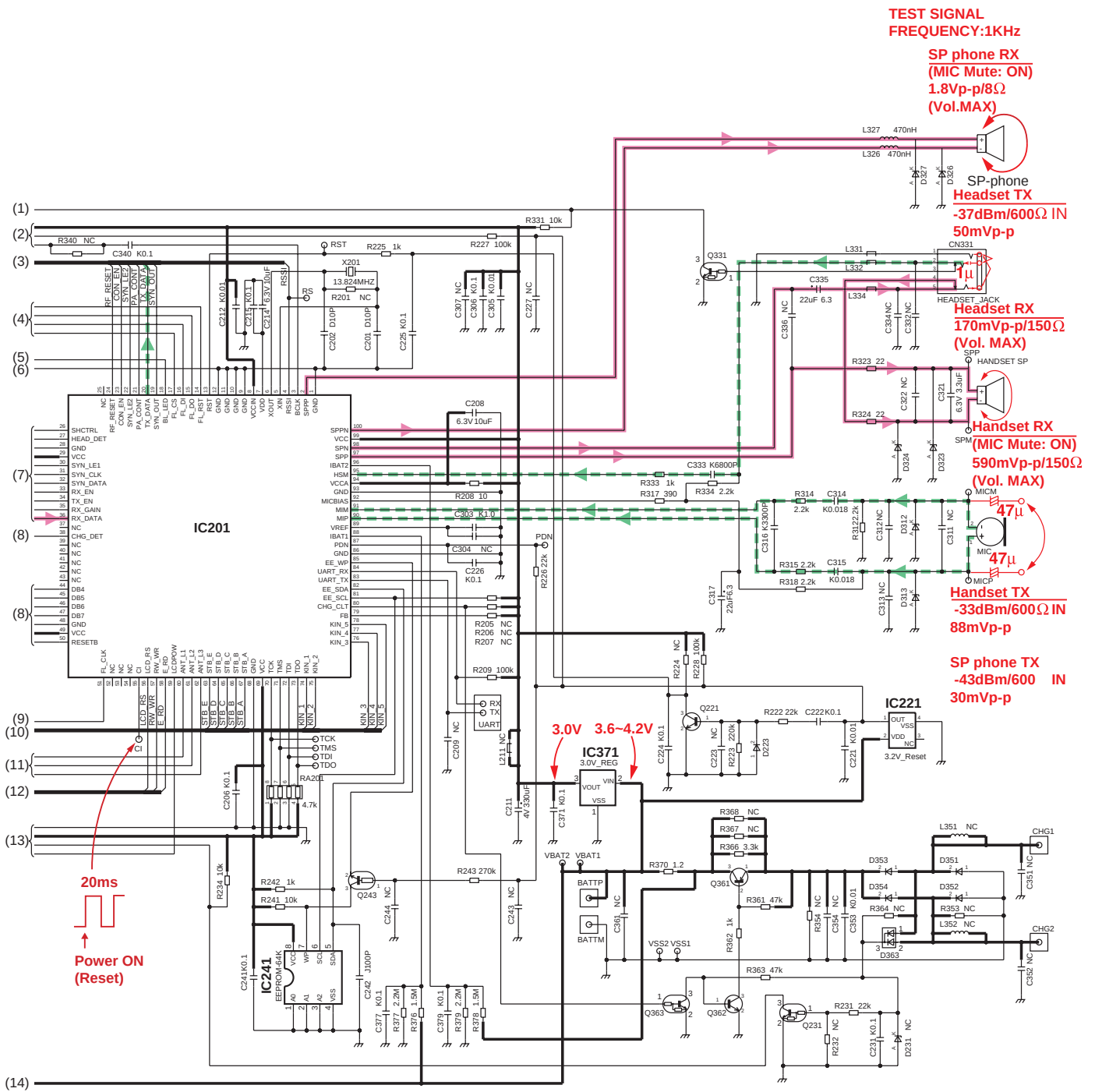
NC: No Components

KX-TG5621 SCHEMATIC DIAGRAM (Base Unit_RF Part)

32 SCHEMATIC DIAGRAM (HANDSET_MAIN)

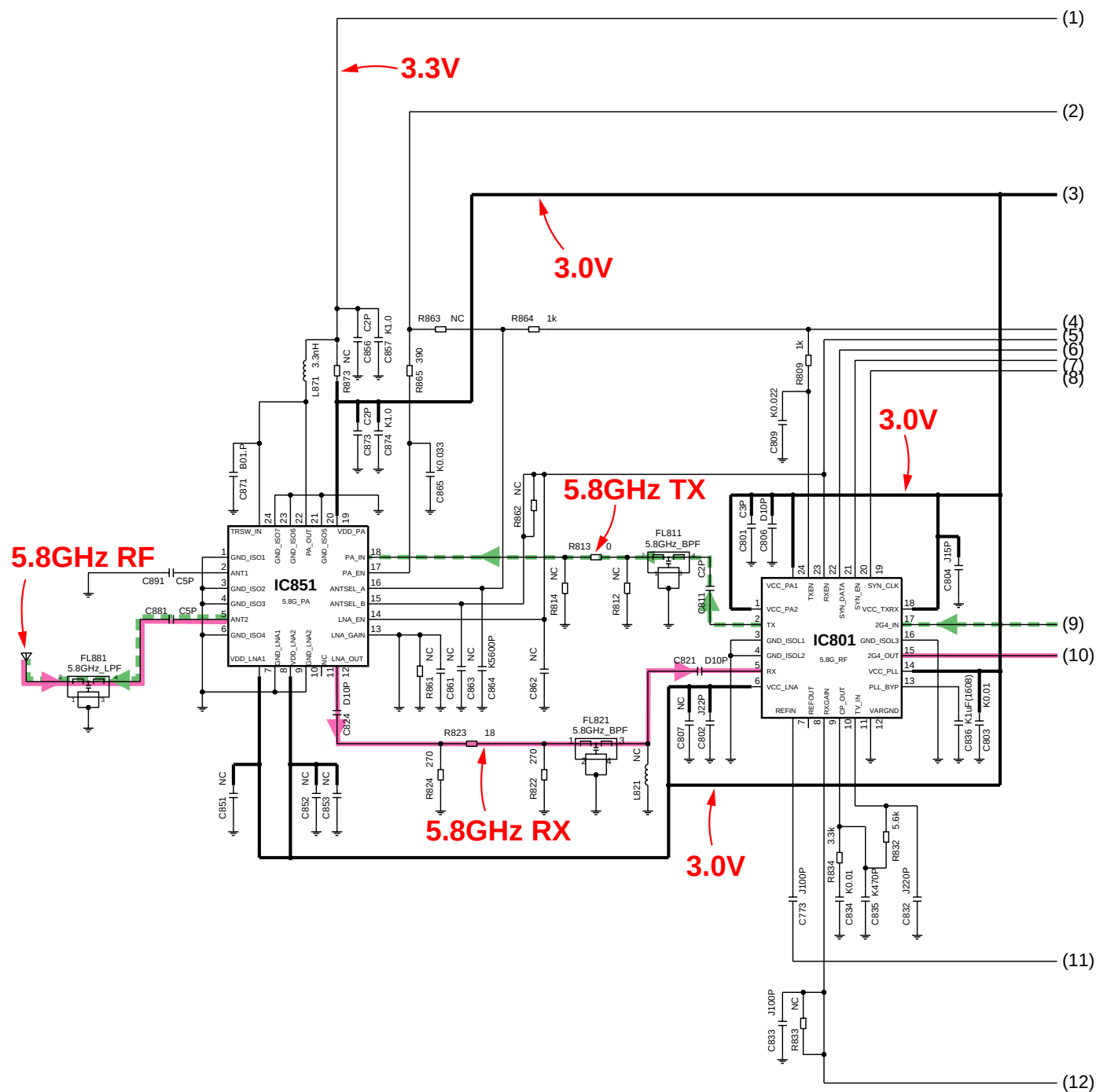


NC: No Components



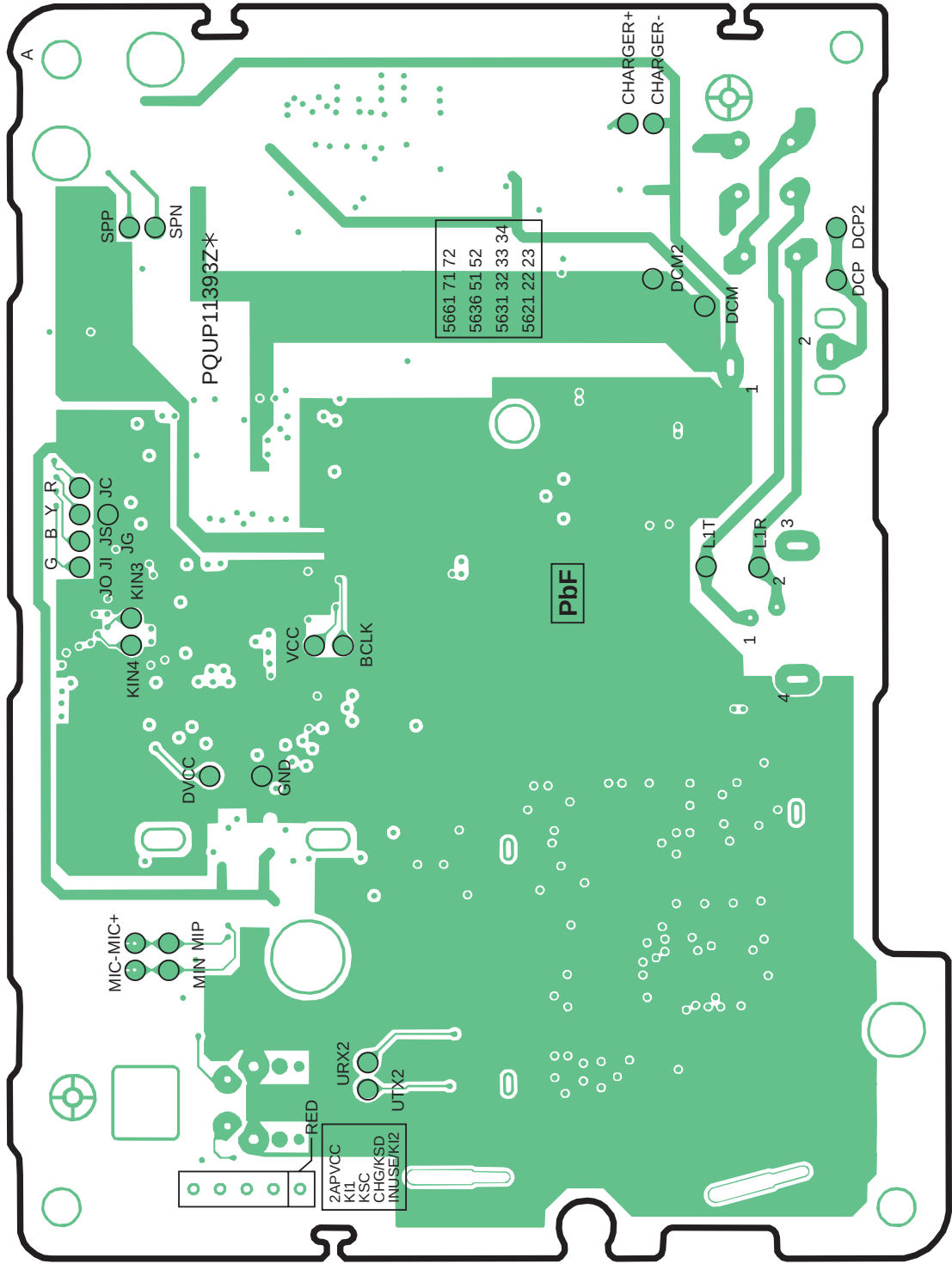
KX-TGA561 SCHEMATIC DIAGRAM (Handset_Main)

33 SCHEMATIC DIAGRAM (HANDSET_RF PART)



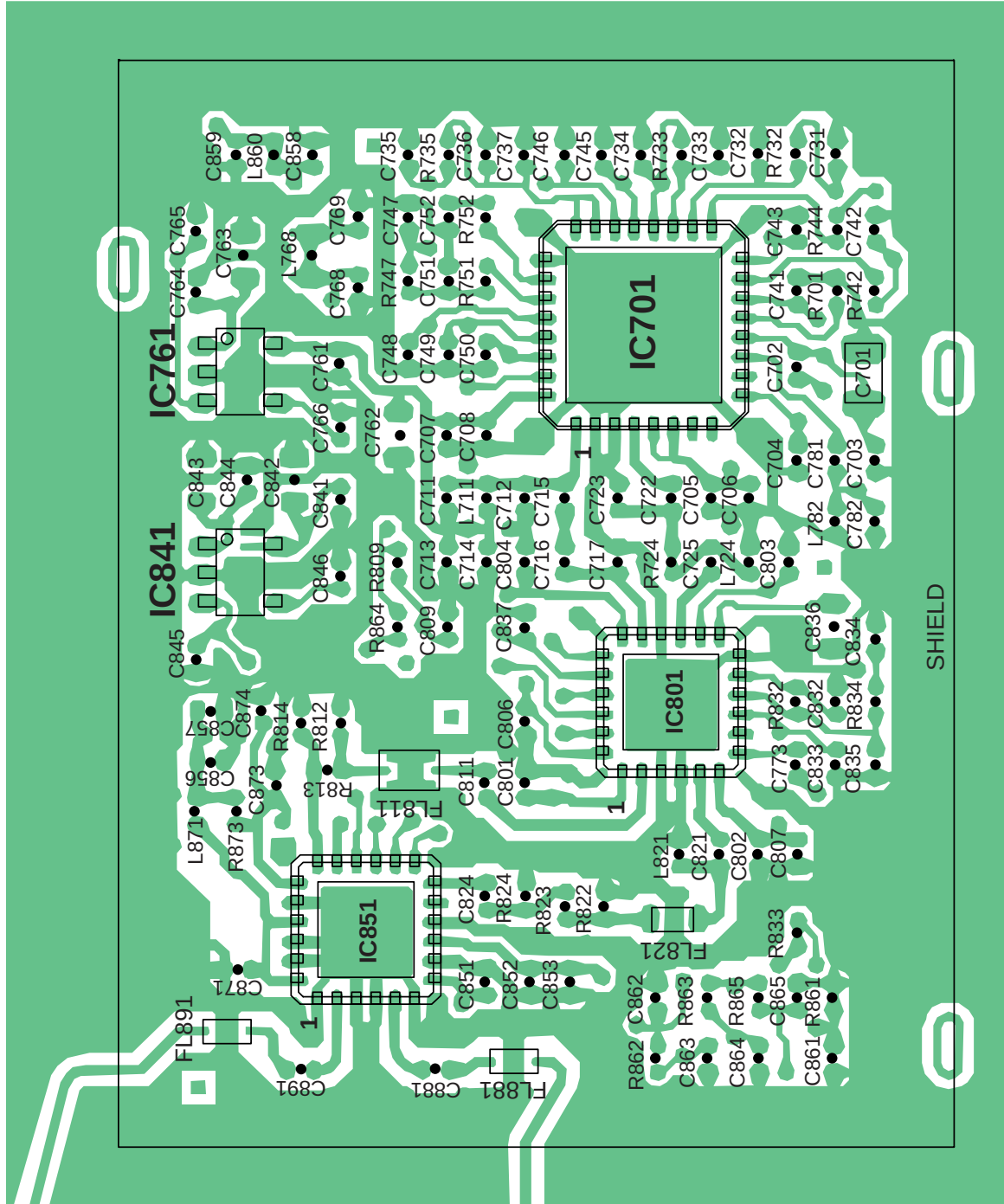
Memo

34.2. Flow Solder Side View



KX-TG5621 CIRCUIT BOARD (Base Unit_Main (Flow Solder Side View))

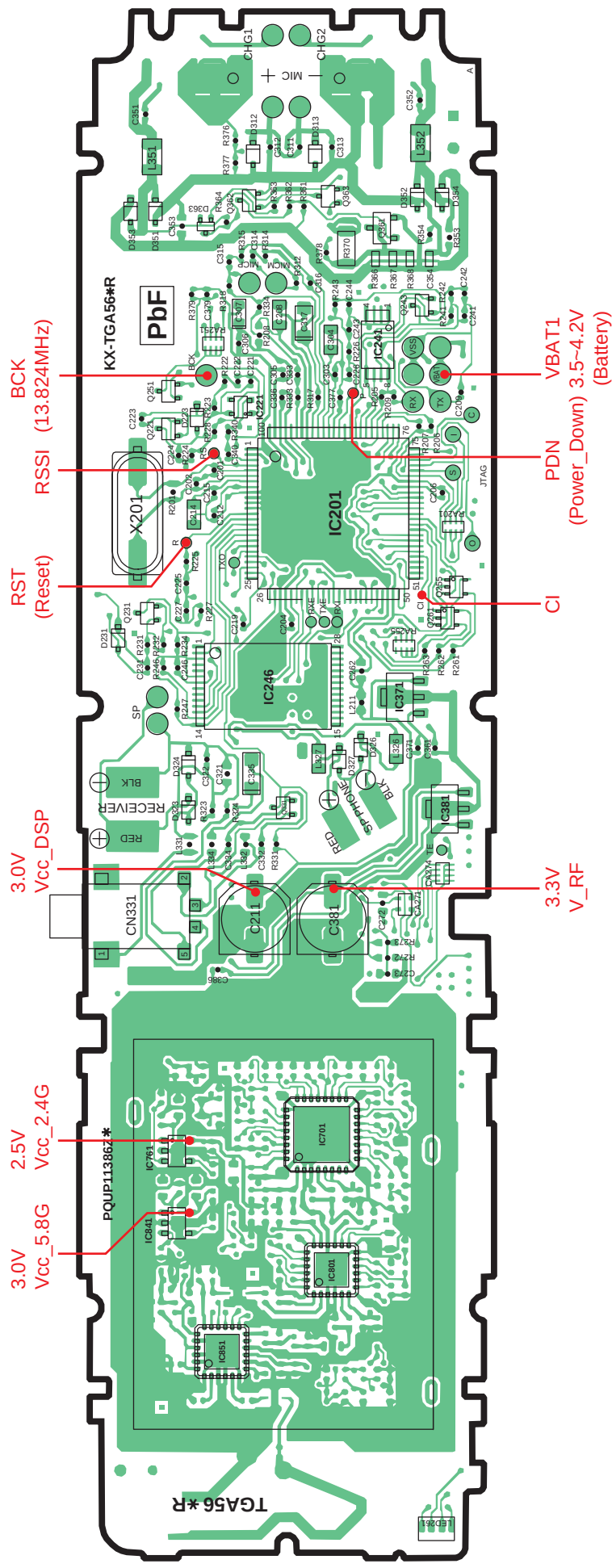
35 CIRCUIT BOARD (BASE UNIT_RF PART)



KX-TG5621 CIRCUIT BOARD (Base Unit_RF Part (Component View))

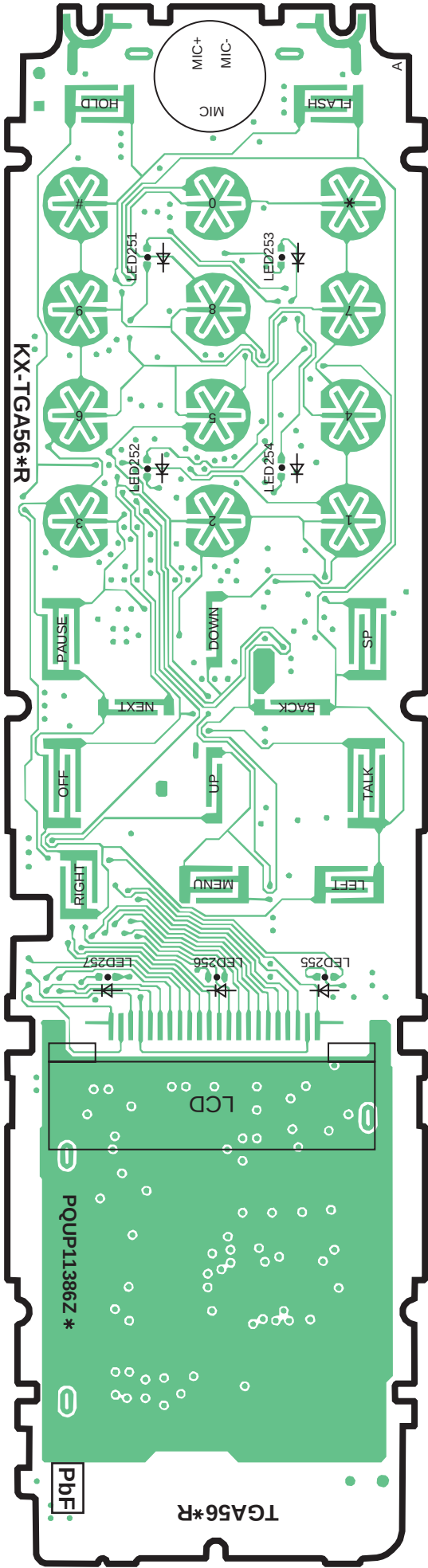
36 CIRCUIT BOARD (HANDSET_MAIN)

36.1. Component View



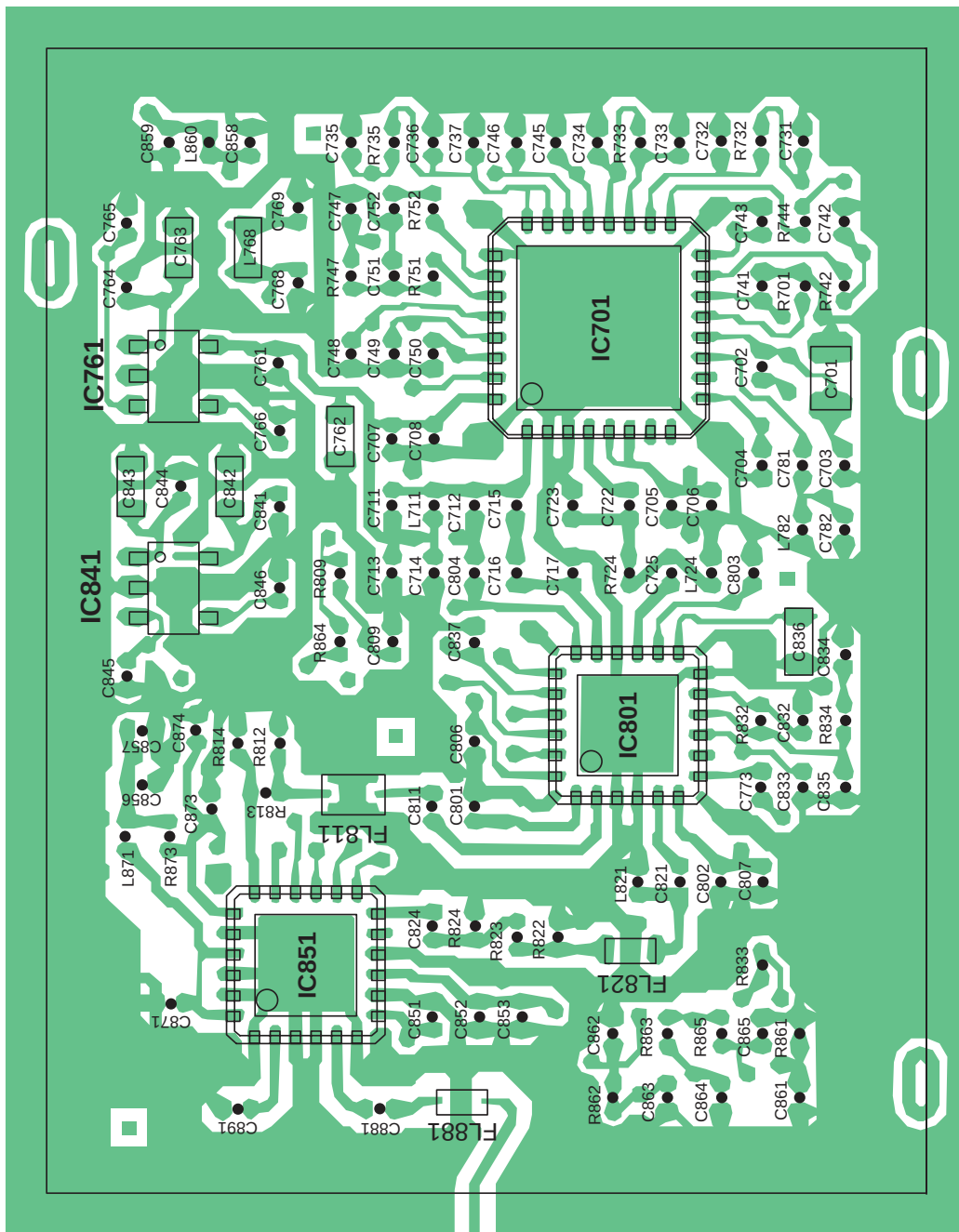
KX-TGA561 CIRCUIT BOARD (Handset_Main (Component View))

36.2. Flow Solder Side View



KX-TGA561 CIRCUIT BOARD (Handset_Main (Flow Solder Side View))

37 CIRCUIT BOARD (HANDSET_RF PART)



KX-TGA561 CIRCUIT BOARD (Handset_RF Part (Component View))

