

Service Manual

Telephone Equipment



2LINE

Model No. **KX-TG9581B**
KX-TG9582B
KX-TGA950B

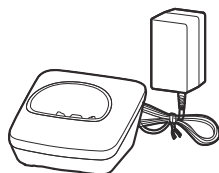
2-LINE Cordless Phone with Link-to-cell
B: Black Version
(for U.S.A.)



KX-TGA950
(Handset)



KX-TG9581
(Base Unit)



(Charger Unit)

Configuration for each model

Model No	Base Unit	Portable	Charger Unit	Expandable
KX-TG9581	1 (TG9581)	1 (TGA950)	1	Up to 6
KX-TG9582	1 (TG9581)	2 (TGA950)	1	Up to 6
KX-TGA950*		1 (TGA950)	1	

* KX-TGA950 is also an optional accessory, which contains a handset and a charger.

 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.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by  in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

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.

- When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.
- The illustrations in this Service Manual may vary slightly from the actual product.

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1 Safety Precautions

1.1. For Service Technicians

- Repair service shall be provided in accordance with repair technology information such as service manual so as to prevent fires, injury or electric shock, which can be caused by improper repair work.
 1. When repair services are provided, neither the products nor their parts or members shall be remodeled.
 2. If a lead wire assembly is supplied as a repair part, the lead wire assembly shall be replaced.
 3. FASTON terminals shall be plugged straight in and unplugged straight out.

- 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.

2 Warning

2.1. Battery Caution

Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

Attention:



A nickel metal hydride battery that is recyclable powers the product you have purchased.

Please call 1-800-8-BATTERY (1-800-822-8837) for information on how to recycle this battery.

2.2. 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).

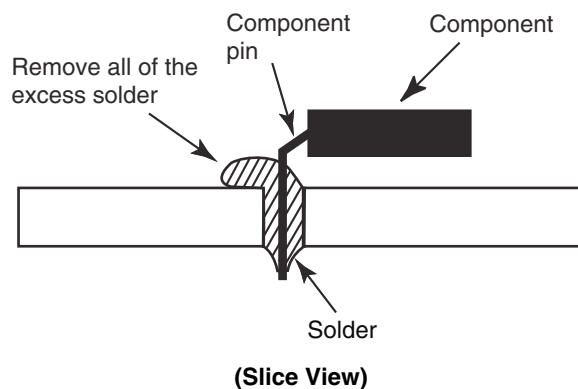
This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder.

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.

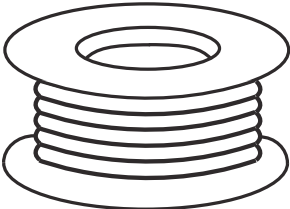
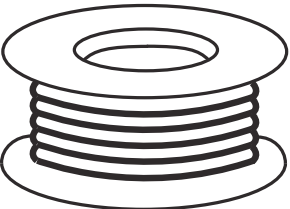
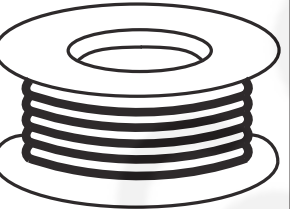
- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100 °F (600 °C).
- When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See the figure below).



2.2.1. 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: 0.3 mm, 0.6 mm and 1.0 mm.

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

2.3. Discarding of P. C. Board

When discarding P. C. Board, delete all personal information such as telephone directory and caller list or scrap P. C. Board.

3 Specifications

■ **Standard:**

DECT 6.0 (Digital Enhanced Cordless Telecommunications 6.0)

Bluetooth wireless technology 2.1

■ **Number of channels:**

60 Duplex Channels

■ **Frequency range:**

1.92 GHz to 1.93 GHz (DECT)

2.402 GHz to 2.48 GHz (Bluetooth)

■ **Duplex procedure:**

TDMA (Time Division Multiple Access)

■ **Channel spacing:**

1,728kHz

■ **Bit rate:**

1,152 kbit/s

■ **Modulation:**

GFSK (Gaussian Frequency Shift Keying)

■ **RF transmission power:**

115 mW (max.)

■ **Voice coding:**

ADPCM 32 kbit/s

■ **Interface:**

USB 2.0 Full speed (12Mbps)

	Base Unit	Portable	Charger
Power source	AC Adaptor (PNLV226Z, 120 V AC, 60 Hz)	Rechargeable Ni-MH battery AAA (R03) size (1.2 V 550 mAh)	AC Adaptor (PNLV233AZ 120 V AC, 60 Hz)
Receiving Method	Super Heterodyne	Super Heterodyne	_____
Oscillation Method	PLL synthesizer	PLL synthesizer	_____
Detecting Method	Quadrature Discriminator	Quadrature Discriminator	_____
Tolerance of OSC Frequency	10.368 MHz ±100 Hz	10.368 MHz ±100 Hz	_____
Modulation Method	Frequency Modulation	Frequency Modulation	_____
ID Code	40 bit	40 bit	_____
Ringer Equivalence No. (REN)	0.1B	_____	_____
Dialing Mode	Tone (DTMF)/Pulse	Tone (DTMF)/Pulse	_____
Redial	Up to 48 digits	Up to 48 digits	_____
Speed Dialer	Up to 24 digits (Phonebook)	Up to 24 digits (Phonebook)	_____
Power Consumption	Standby: Approx. 1.1 W Maximum: Approx. 3.5 W	7 days at Standby, 15 hours at Talk	Standby: Approx. 0.1 W, Maximum: Approx. 1.8 W
Operating Conditions	0 °C - 40 °C (32 °F - 104 °F), 20 % - 80 % relative air humidity (dry)	0 °C - 40 °C (32 °F - 104 °F), 20 % - 80 % relative air humidity (dry)	0 °C - 40 °C (32 °F - 104 °F), 20 % - 80 % relative air humidity (dry)
Dimensions (H x W x D)	Approx. 122mm x 258 mm x 174 mm	Approx. 168 mm x 48 mm x 31 mm	Approx. 39 mm x 72 mm x 73 mm
Mass (Weight)	Approx. 860 g	Approx. 110 g	Approx. 100 g

Note:

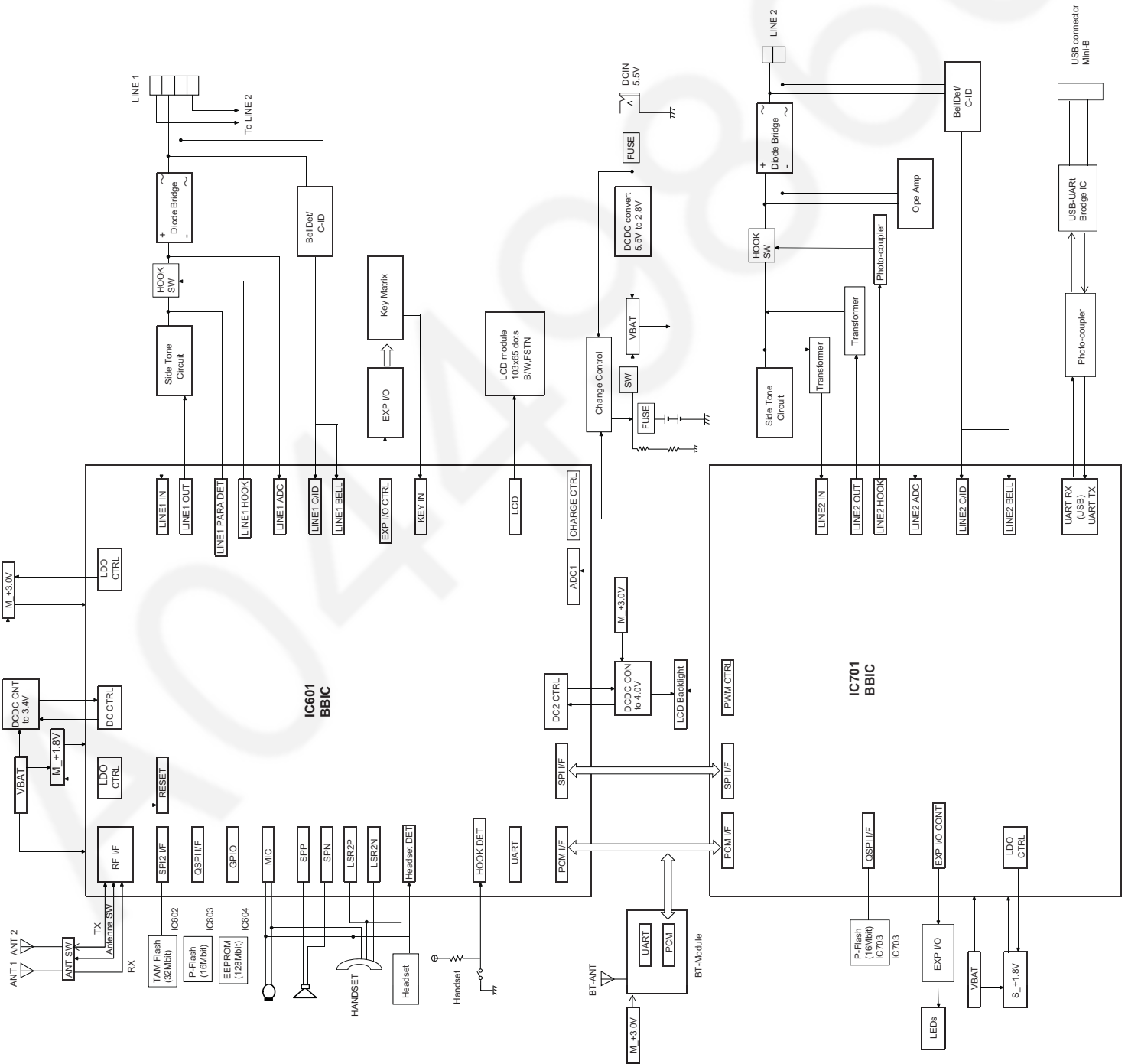
- Design and specifications are subject to change without notice.

Note for service:

- Operation range: Up to 300 m outdoors, Up to 50 m indoors, depending on the condition.
- Analog telephone connection: Telephone Line
- Optional headset: KX-TCA60, KX-TCA93, KX-TCA400, KX-TCA430
- Optional range extender: KX-TGA405
- Optional key detector: KX-TGA20
- T-adaptor: KX-J66

4 Technical Descriptions

4.1. Block Diagram (Base Unit)



4.2. Circuit Operation (Base Unit)

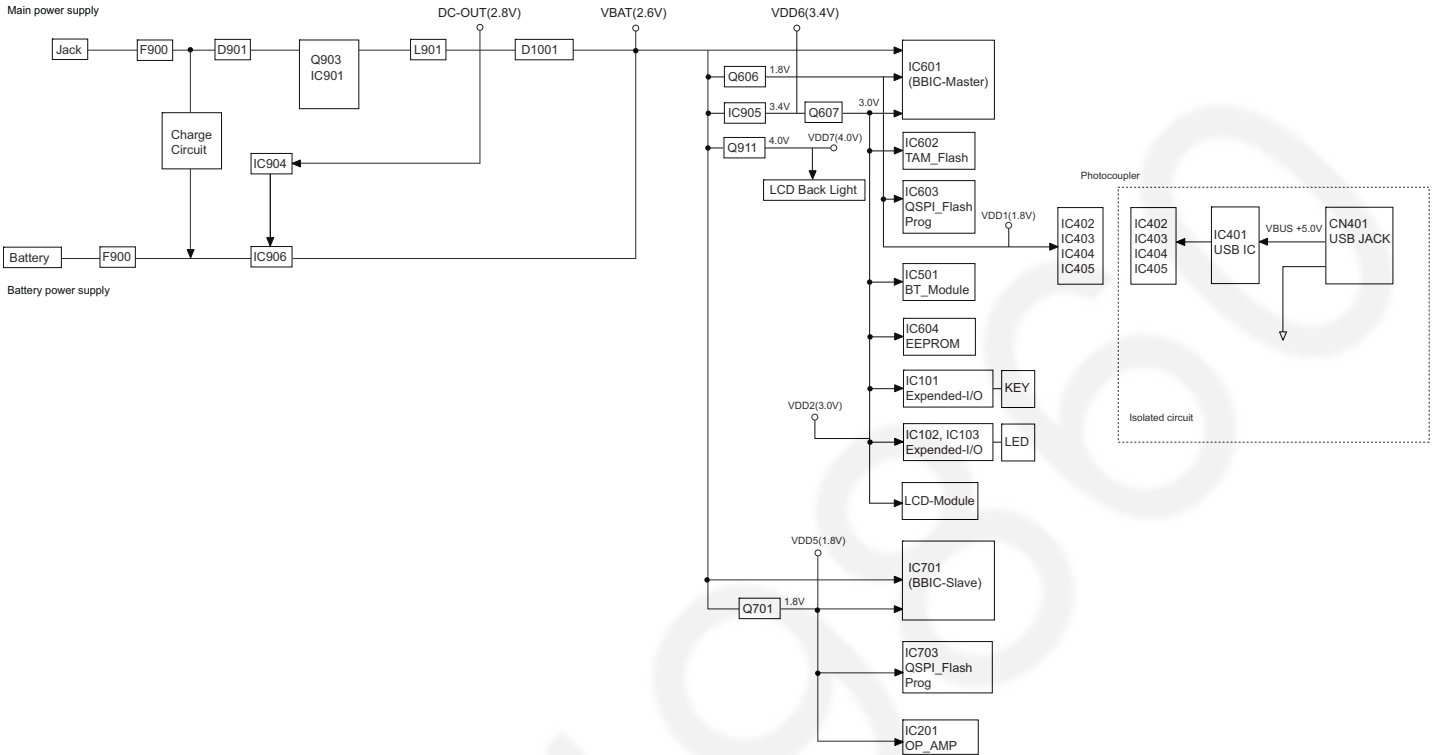
4.2.1. Outline

Base unit consists of the following ICs as shown in **Block Diagram (Base Unit)** (P.8).

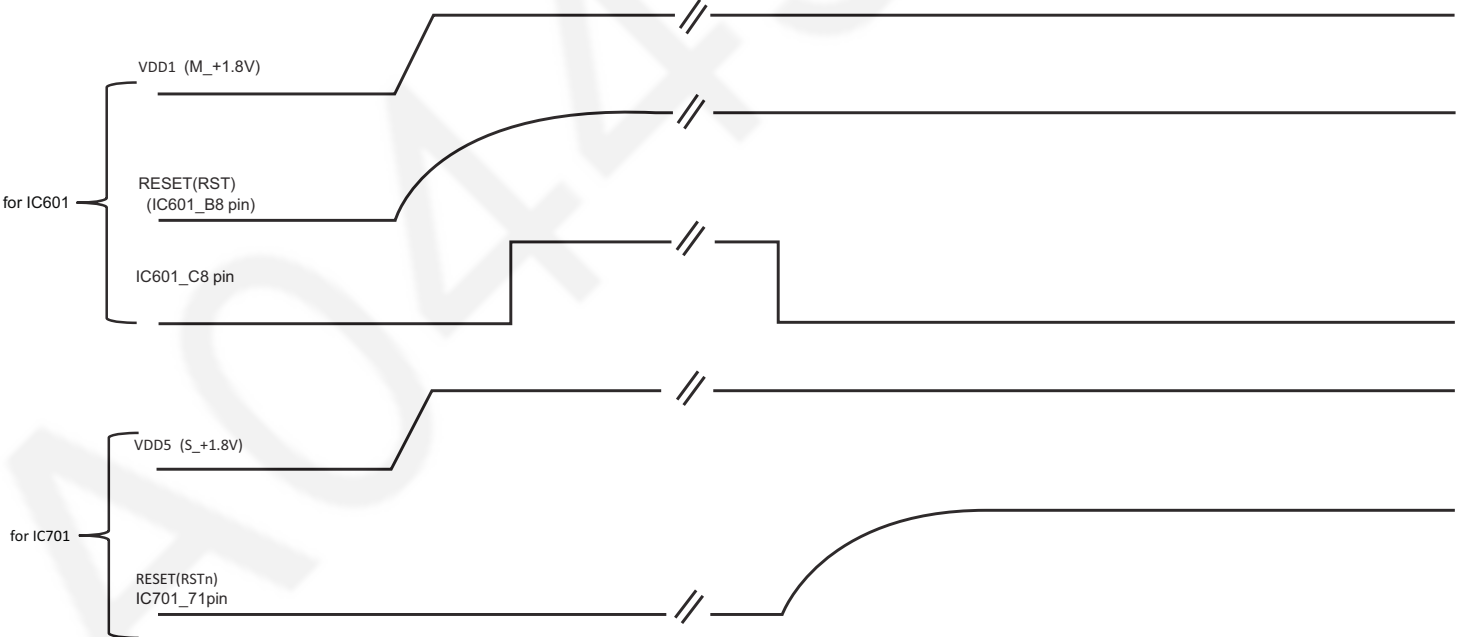
- DECT BBIC (**BBIC(Master)**): IC601
 - Handling all the audio, signal and data processing needed in a US DECT base unit
 - Controlling the US DECT specific physical layer and radio section (**Burst Module Controller** section)
 - ADPCM code filter for speech encoding and speech decoding (DSP section)
 - Echo-cancellation and Echo-suppression (DSP section)
 - Any tones (tone, sidetone, ringing tone, etc.) generation (DSP section)
 - DTMF receiver (DSP section)
 - Clock Generation for RF Module
 - ADC, DAC, timer, and power control circuitry
 - All interfaces (ex: RF, EEPROM, LED, Analog Front End, etc.)
 - PLL Oscillator
 - Detector
 - Compress/Expander
 - First Mixer
 - Amplifier for transmission and reception
 - Voice data compression and decompression
 - Speaker Amp
 - SP-Phone MIC Amp
 - SP-Phone Speaker Amp
- EEPROM: IC604
 - Temporary operating parameters (for RF, etc.)
- FLASH MEMORY 1: IC602
 - Voice Prompt (TAM) D/L Area
 - ICM/OGM/MEMO Recording Area
- Additionally,
 - Power Supply Circuit (+4.0 V, +3.4 V, +3.0V, +1.8 V output)
 - Crystal Circuit (10.368 MHz)
 - Telephone Line Interface Circuit
- FLASH MEMORY 2: IC603
 - Program DL
- LED Driver: IC102, IC103
- LCD Driver: IC601
- Key Matrix: IC101
- BBIC (Slave) IC701
 - ADPCM code filter for speech encoding and speech decoding (DSP section)
 - Echo-cancellation and Echo-suppression (DSP section)
 - Any tones (tone, sidetone, ringing tone, , etc.) generation (DSP section)
 - DTMF receiver (DSP section)
- FLASH MEMORY IC703
 - Program DL
- BT Module (IC501)
 - Use for Bluetooth communication
- USB
 - USB to UART Bridge Controller: IC401
 - Photocoupler: IC402, IC403, IC404, IC405

The power is supplied to the DECT-BBIC(Master),TAM-Flash,QSPI-Flash,BT-Module,EEPROM, Expanded-I/O,BBIC(Slave),QSPI-Flash(forSlave),Expanded-I/O;
The brief block diagram is below.

AC-Adaptor



<Fig.101>

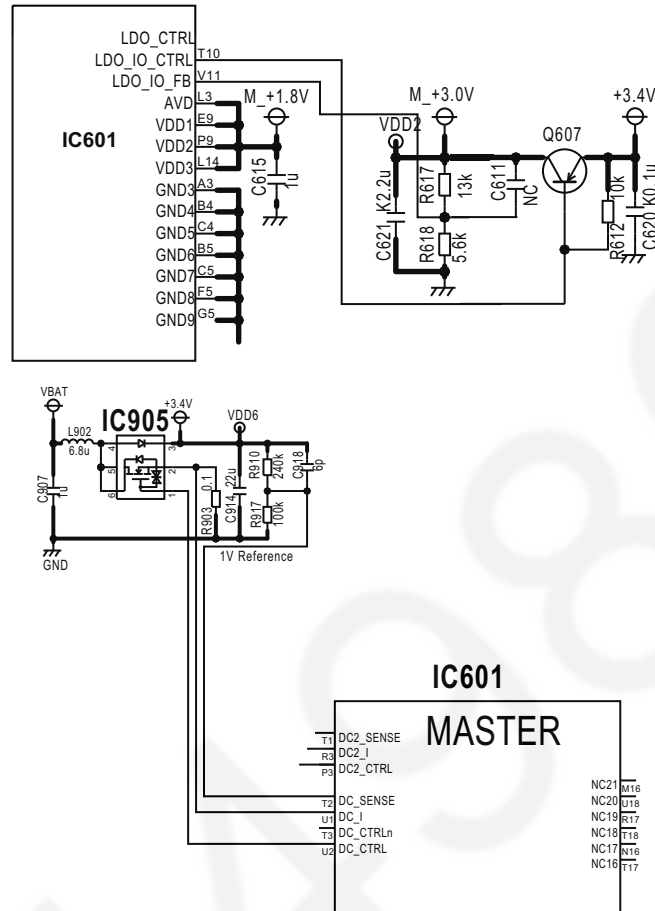


<Fig.102>

4.2.2.4. Power supply(3.0V) :VDD2

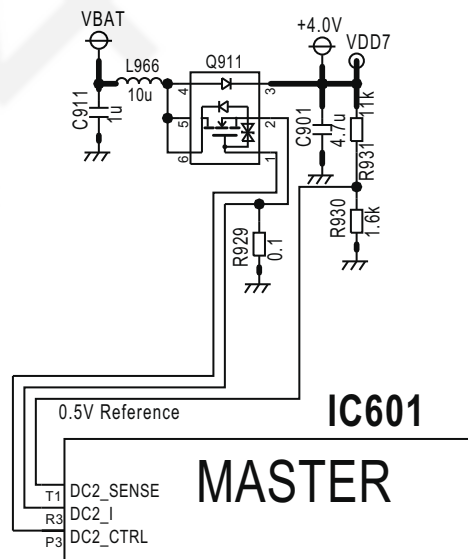
This power supply is for Memory IC(IC602, IC603, IC604) and LCD-module and so on.
It consists of BBIC IC601 and Q607.

VBAT steps up to VDD6(3.4V) by IC601 and IC905. After that it gets VDD2(3.0V).
Because it is to use Battery supply at power failure.



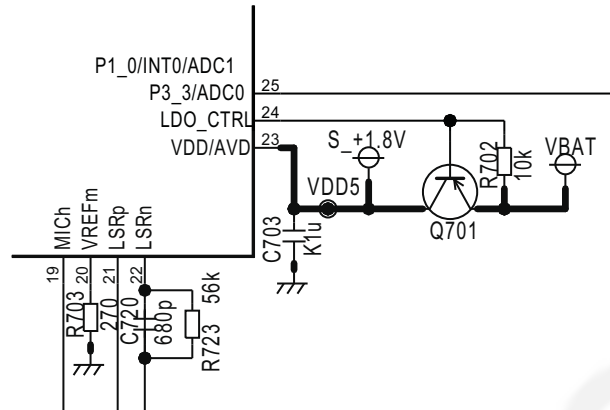
4.2.2.5. Power supply(4.0V) :VDD7

This is a power supply for LCD back light.
It consists of IC601 and Q911.



4.2.2.6. Power supply(1.8V) :VDD5

This power supply consist of IC601and Q701 for CPU CORE and Memory on BBIC IC701.



4.2.3. Telephone Line Interface

Note:

[]: Line 2

<Function>

- Bell signal detection
- Clip signal detection
- ON/OFF hook circuit

Bell & Clip (: Calling Line Identification Presentation: Caller ID) signal detection:

In the standby mode, Q101 [Q201] is open to cut the DC loop current and decrease the ring load.

When ring voltage appears at the L1T (A) [L2T (C)] and L1R (B) [L2R (D)] leads (when the telephone rings), the AC ring voltage is transferred as follows;

A [C] - C125 [C227] - R121 [R223] - IC601 (H1) [IC701 (15)] (Clip) ┐
 B [D] - C127 [C225] - R123 [R221] - IC601 (H2) [IC701 (17)] (Clip) ┘
 -- IC601(J2)[IC701(18)] - R637[R725] - R636[R726] - IC601(F3)[IC701(12)] -(Bell)

ON/OFF hook circuit:

In the standby mode, Q101 [Q201] is open, and connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an **on-hook condition**.

When IC601 [IC701] detects a ring signal or press the TALK Key onto the portable, Q102 [Q202] turns on and then Q101, [Q201, PC201] turns on, thus providing an **off-hook condition** (DC current flows through the circuit) and the following signal flow makes the loop current.

A [C] → D101 [D201] → Q101 [Q201] → Q103 [Q203] → R108 [R208] → D101 [D201] → B [D]

4.2.4. Transmitter/Receiver

- Audio Circuits and DTMF tone signal circuits.

Base unit and portable mainly consist of RF and DECT BBIC.

Base unit and portable transmit/receive voice signal and data signal through the antenna on carrier frequency.

Signal Path:

*Refer to **Signal Route** (P.18).

4.2.4.1. Transmitter Block

The voice signal input from the TEL LINE 1 interface goes to RF ,through DECT BBIC (IC601) as shown in **Block Diagram (Base Unit)** (P.8)

The voice signal input from the TEL LINE 2 interface goes to RF though SlaveBBIC(IC701) and BBIC(Master : IC601) as shown in BlockDiagram.

The voice signal passes through the analog part of IC601 [IC701] where it is amplified and converted to a digital audio stream signal. The burst switch controller processes this stream performing encryption and scrambling, adding the various other fields to produce the GAP (**Generic Access Profile**) standard DECT frame, assigning to a time slot and channel etc.

In IC601, the carrier frequency is changing, and frequency modulated RF signal is generated and amplified, and radiated from antenna. Portable detects the voice signal or data signal in the circuit same as the following explanation of Receiver Block.

4.2.4.2. Receiver Block

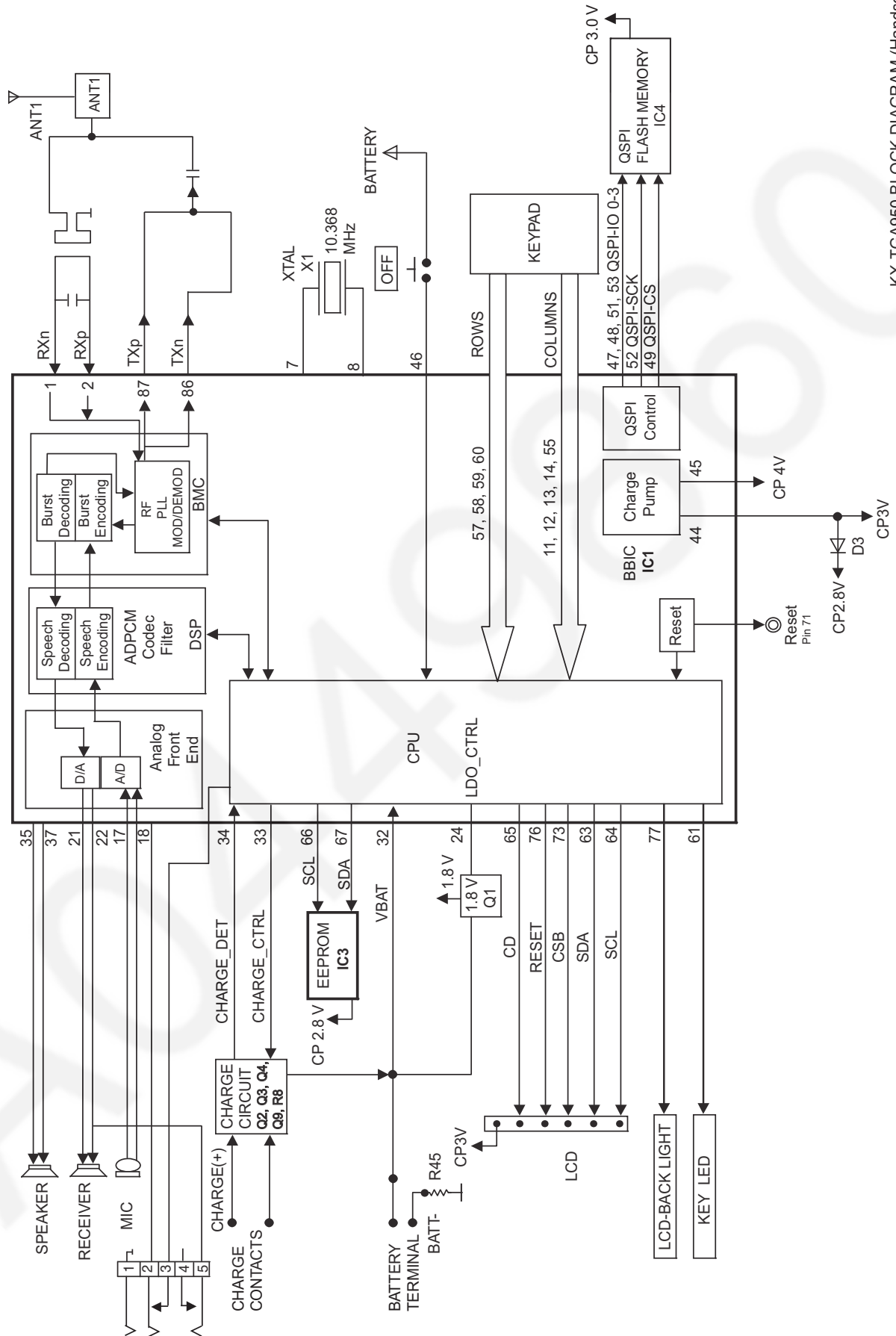
The signal of 1900 MHz band (1920 MHz ~ 1930 MHz) which is input from antenna is input to IC601 as shown in **Block Diagram (Base Unit)** (P.8).

In IC601, the signal of 1900 MHz band is downconverted to 864 kHz signal and demodulated, GAP (**Generic Access Profile**) standard DECT frames. It passes through the decoding section burst switch controller where it separates out the frame information and performs de-encryption and de-scrambling as required. It then goes to the DSP section where it is turned back into analog audio. This is amplified by the analog front end, and goes to the TEL LINE 1 [IC701, TEL LINE 2] Interface.

4.2.5. USB Interface

- IC401 includes a USB 2.0 full-speed function controller. USB transceiver, oscillator, one-time programmable ROM, and asynchronous serial data bus (UART) with full modem control signal. USB and UART is bridged by IC401

4.3. Block Diagram (Handset)



4.4. Circuit Operation (Handset)

4.4.1. Outline

Handset consists of the following ICs as shown in **Block Diagram (Handset)** (P.15).

- DECT BBIC (**B**ase **B**and IC): IC1
 - All data signals (forming/analyzing ACK or CMD signal)
 - All interfaces (ex: Key, Detector Circuit, Charge, DC/DC Converter, EEPROM, LCD, RF Power Amp.)
 - PLL Oscillator
 - Detector
 - Compress/Expander
 - Reception
 - Integrated 1.9 GHz PA for DECT
- QSPI FLASH MEMORY: IC4
 - Main Program D/L Area
- EEPROM: IC3
 - Temporary operating parameters (for RF, etc.)

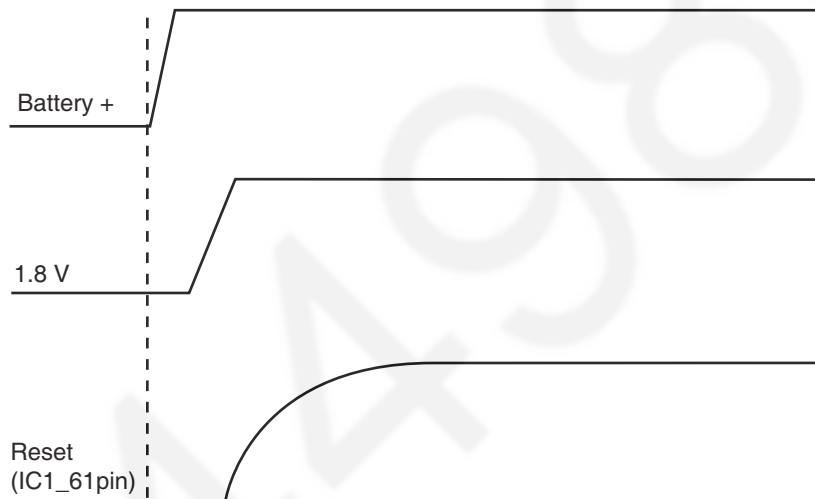
4.4.2. Power Supply Circuit/Reset Circuit

Circuit Operation:

When power on the Handset, the voltage is as follows;

BATTERY(2.2 V ~ 2.6 V: BATT+) → F1 → Q1 (1.8 V), IC1-44pin (3.0V)

The Reset signal generates IC1 (71 pin) and 1.8 V.



4.4.3. Charge Circuit

Circuit Operation:

When charging the handset on the charger, the charge current is as follows;

CHARGE+(Charger) → CHARGE+(Handset) → R8 → Q3 → F1 → BATTERY (+) →

BATTERY(-) → R45 → GND → CHARGE-(Handset) → CHARGE-(Charger)

In this way, the BBIC on Handset detects the fact that the battery is charged.

The charge current is controlled by switching Q9 of Handset.

Refer to Fig.101 in **Power Supply Circuit** (P.10).

4.4.4. Battery Low/Power Down Detector

Circuit Operation:

"Battery Low" and "Power Down" are detected by BBIC which check the voltage from battery. The detected voltage is as follows;

- Battery Low

Battery voltage: $V(\text{Batt}) \leq 2.25 \text{ V} \pm 50 \text{ mV}$

The BBIC detects this level and "🔋" starts flashing.

- Power Down

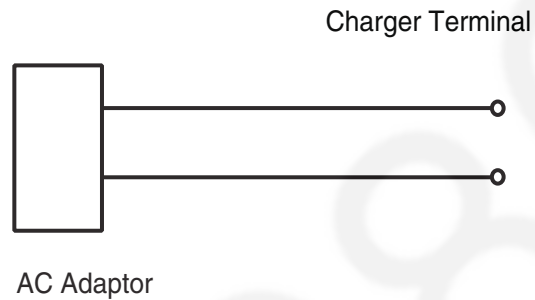
Battery voltage: $V(\text{Batt}) \leq 2.0 \text{ V} \pm 50 \text{ mV}$

The BBIC detects this level and power down.

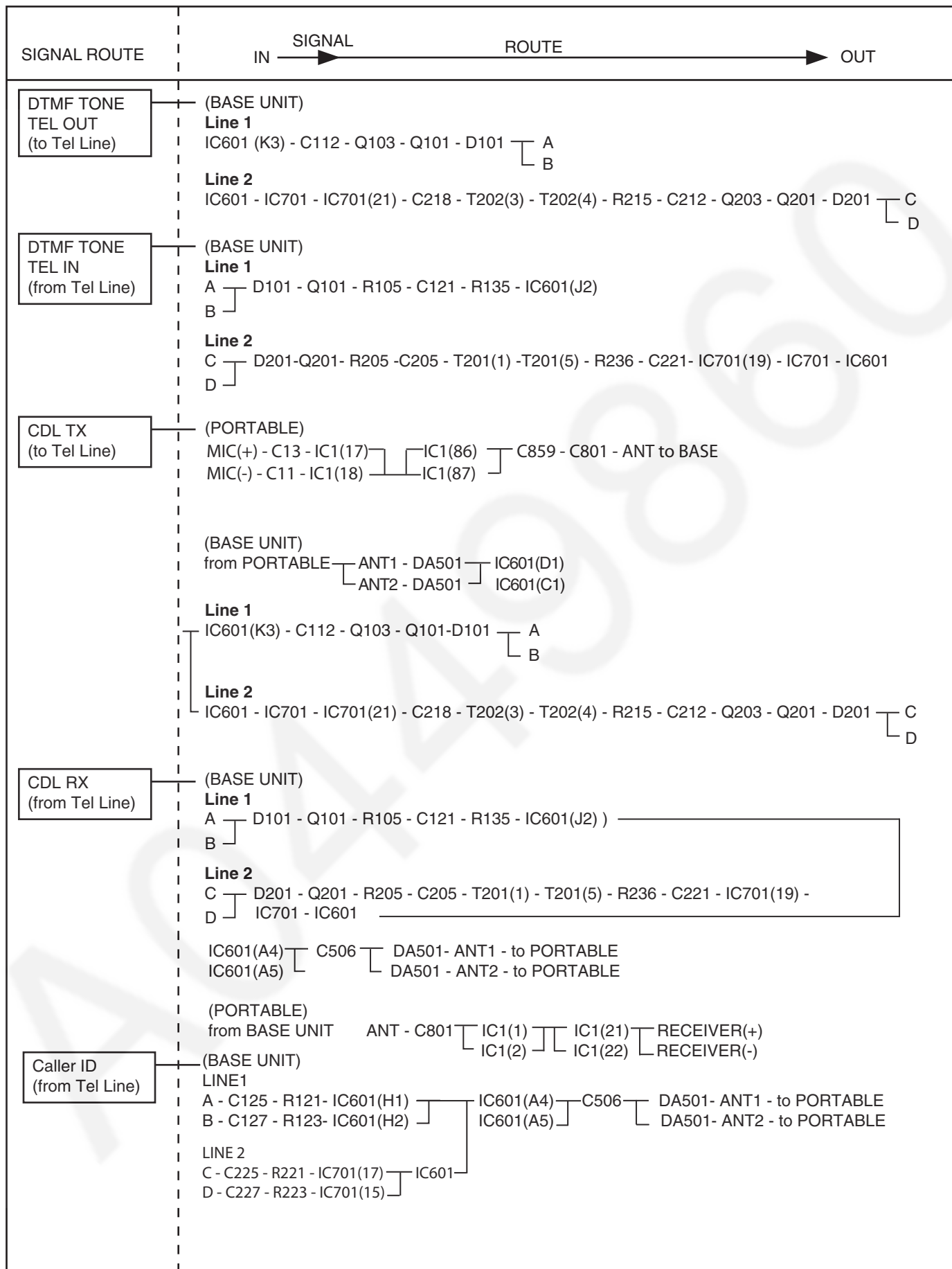
4.4.5. Speakerphone

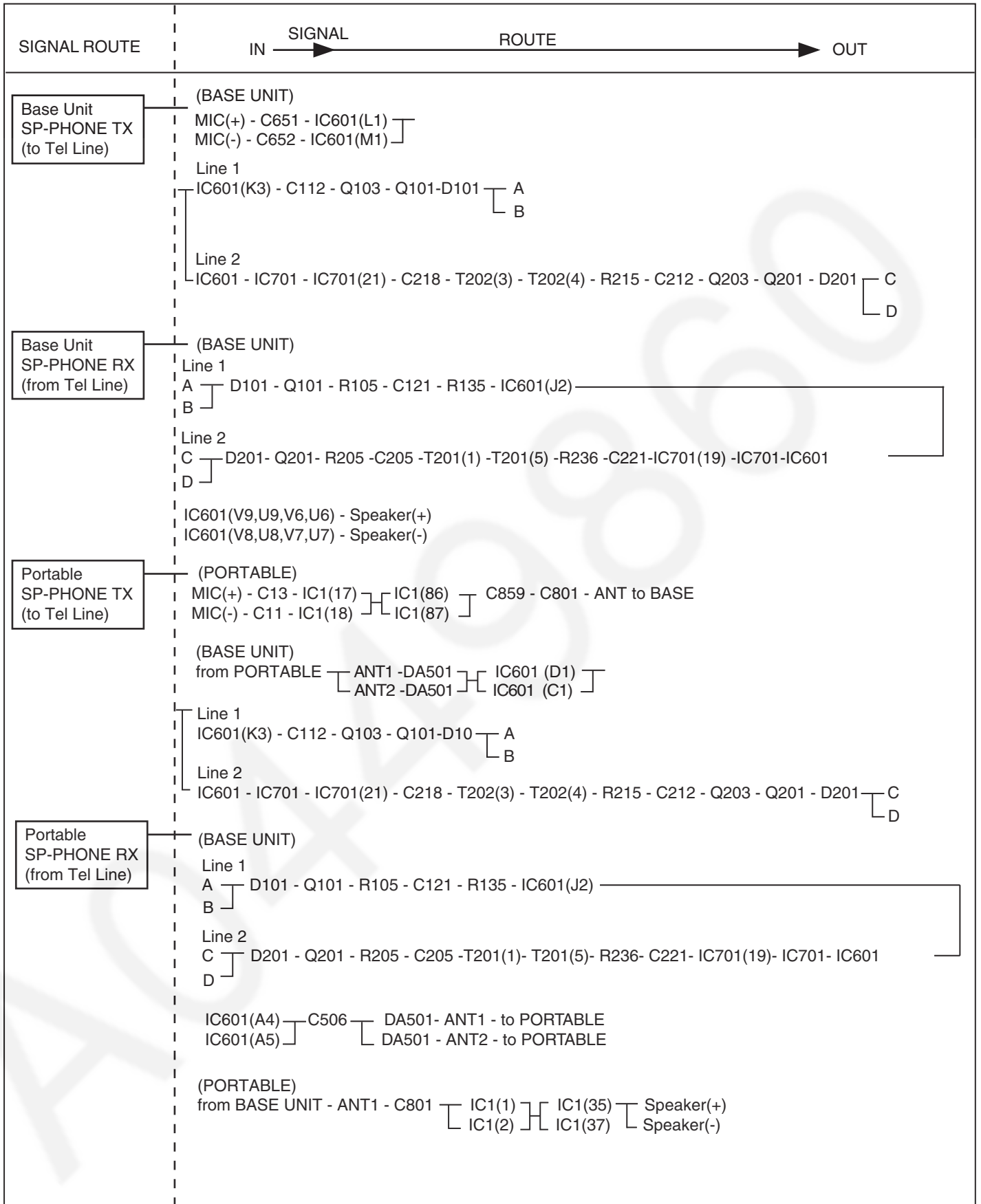
The hands-free loudspeaker at SP+ and SP- is used to generate the ring alarm.

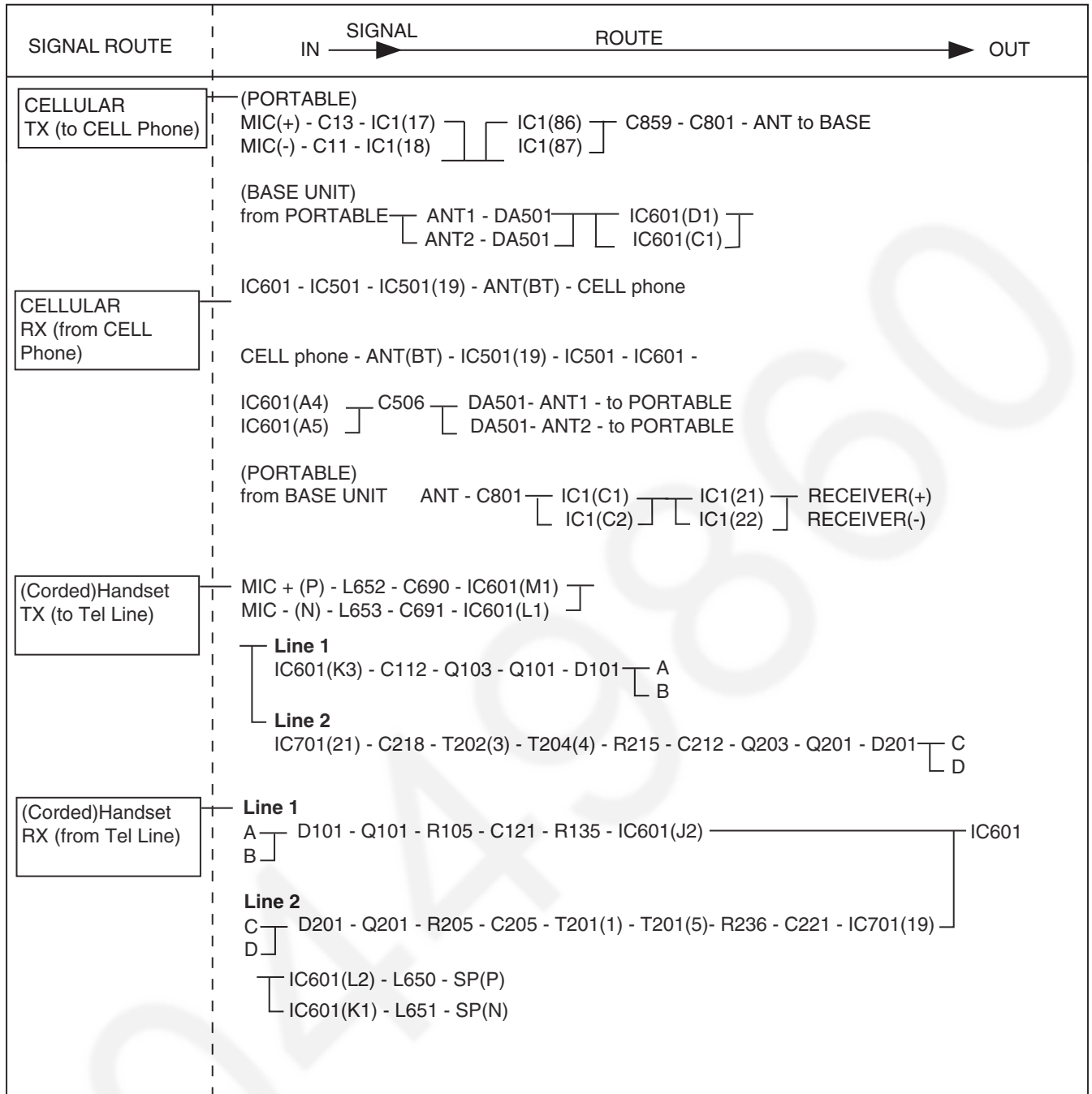
4.5. Block Diagram (Charger Unit)



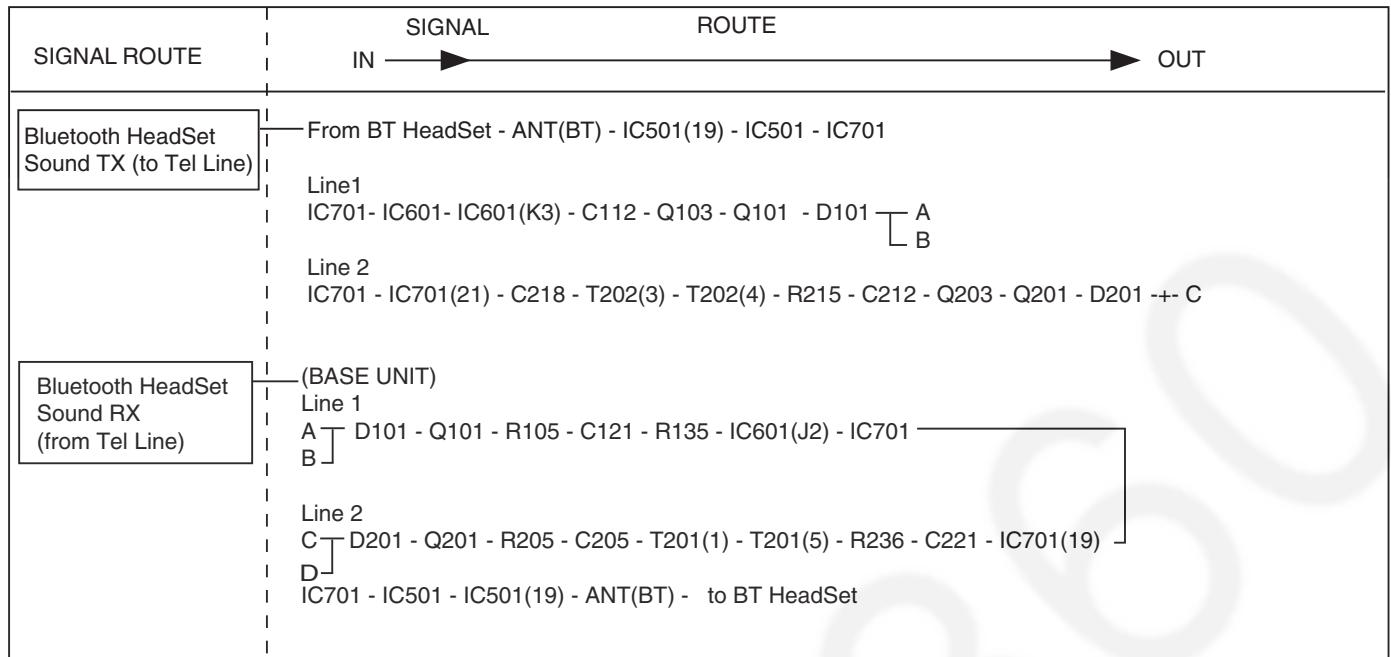
4.6. Signal Route



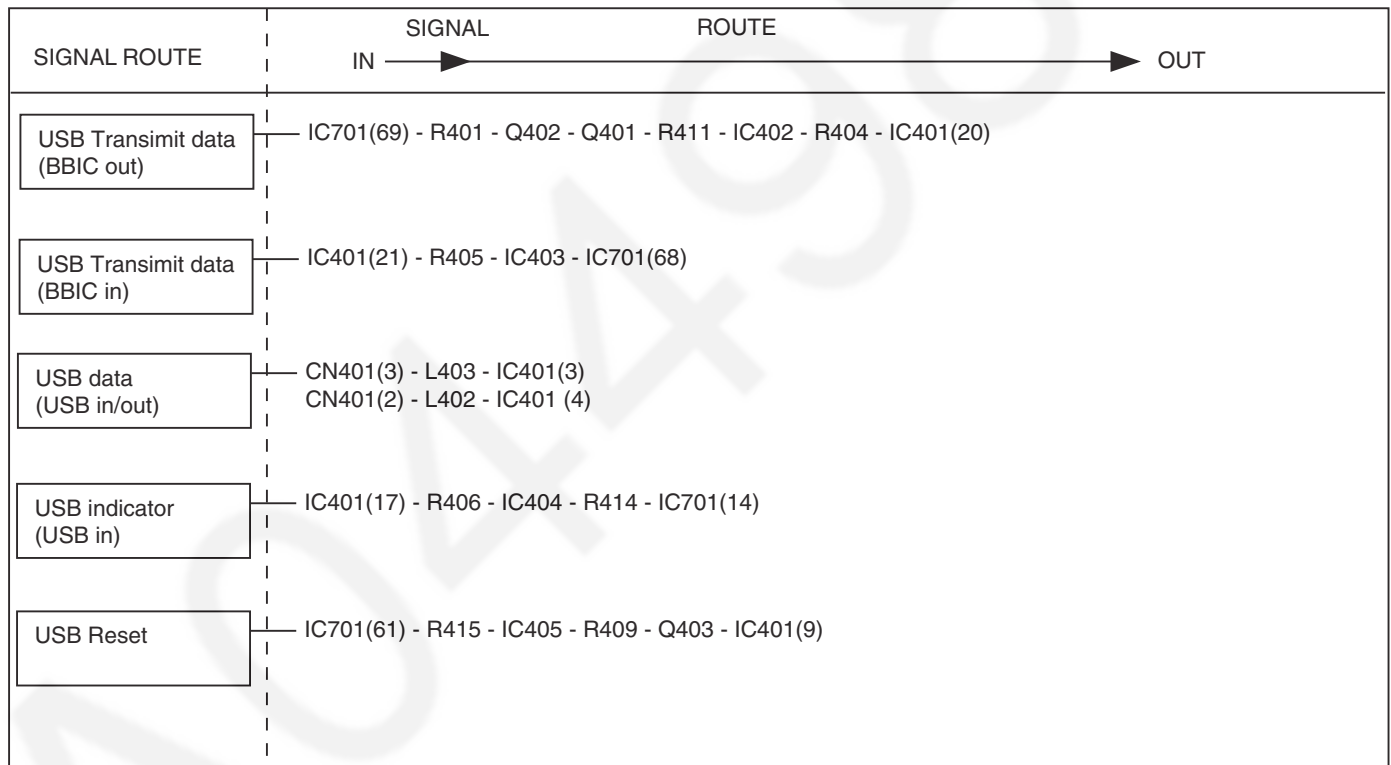




BLUETOOTH



USB



5 Location of Controls and Components

Refer to the Operating Instructions.

Note:

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

6 Installation Instructions

Refer to the Operating Instructions.

Note:

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

7 Operating Instructions

Refer to the Operating Instructions.

Note:

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

7.1. Registering a Handset to the Base Unit

Registering a handset to the base unit

The supplied handset and base unit are pre-registered. If for some reason the handset is not registered to the base unit, re-register the handset.

- 1 **Handset:**
[MENU] [#130]
- 2 **Base unit:**
Press and hold [LOCATOR] for about 5 seconds until the registration tone sounds.
 - If all registered handsets start ringing, press [LOCATOR] again to stop, then repeat this step.
- 3 **Handset:**
Press [OK], then wait until a long beep sounds.

Note:

- When you purchase an additional portable, refer to the additional portable's installation manual for registration.

7.1.1. Deregistering a Handset

A handset can cancel its own registration to the base unit, or other handsets registered to the same base unit. This allows the handset to end its wireless connection with the system.

Handset / Base unit

- 1 [MENU] [#131]
 - All handsets registered to the base unit are displayed.
- 2 [↕]: Select the handset you want to cancel.
→[SELECT]
- 3 [↕]: "Yes" →[SELECT]
- 4 Proceed with the operation for your unit.
Handset: [OFF]
Base unit: [EXIT]

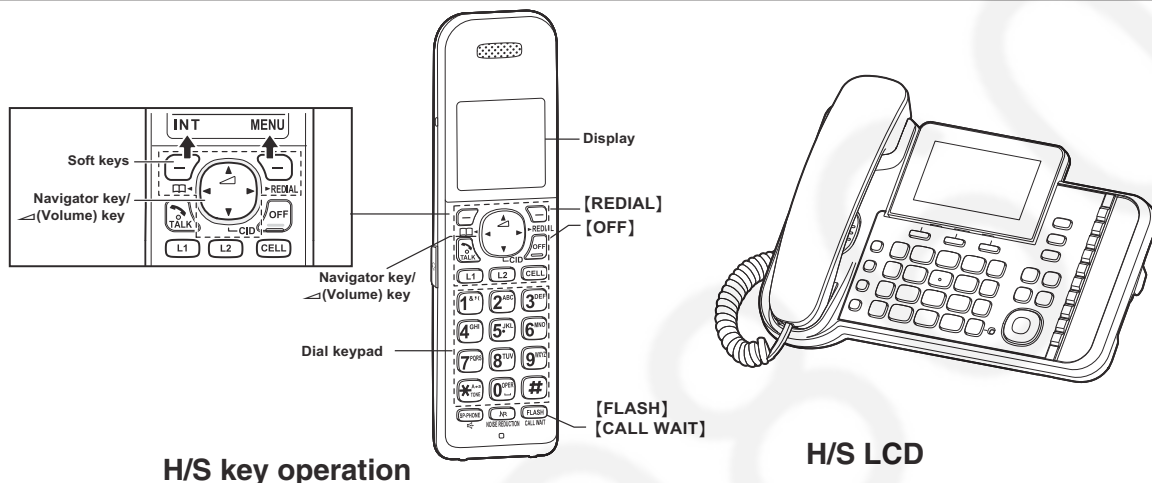
8 Test Mode

8.1. Engineering Mode

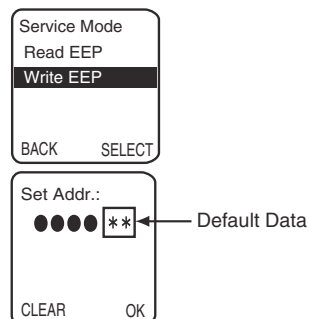
8.1.1. Base Unit

Important:

Make sure the address on LCD is correct when entering new data. Otherwise, you may ruin the unit.
Data on base unit can be checked and changed by handset.
Prepare base unit (with power on) and handset.



- 1). Press [MENU].
- 2). Select "Initial setting" using [▲] or [▼] then press [SELECT] or [▶].
- Select "Set tel line" using [▲] or [▼] then press [SELECT] or [▶].
- 3). Enter "7", "2", "6", "2", "7", "6", "6", "4".
Note: 7262 7664 = PANA SONI
(see letters printed on dial keys)
- 4). Select "Write EEP" using [▲] or [▼] then press [SELECT] or [▶].
- 5). Enter "0", "0", "0", "0" (Address). (*1)
- 6). Enter "*", "*" (New Data). (*1)



- 7). Press **[OK]** , a long confirmation beep will be heard.

Set Addr.:
●●●●** ← New Data
CLEAR OK

Set Addr.:
- - - - -
BACK

- 8). Press **[OFF]** to return to standby mode.
After that, turn the base unit power off and then power on.

Note:

(*1) When you enter the address or New Data, please refer to the table below.

Desired Number (hex)	Input Keys	Desired Number (hex)	Input Keys
0	0	A	[Flash] + 0
1	1	B	[Flash] + 1
.	.	C	[Flash] + 2
.	.	D	[Flash] + 3
.	.	E	[Flash] + 4
9	9	F	[Flash] + 5

Frequently Used Items (Base Unit)

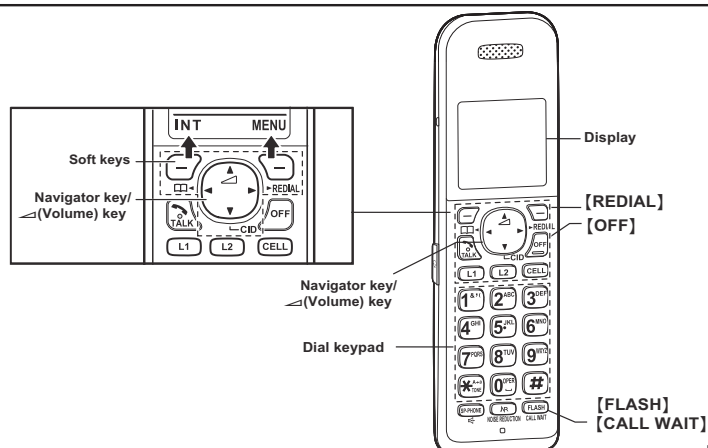
ex.)

Items		Address	Default Data	New Data		Remarks
C-ID (FSK) sensitivity (LINE 1)		0FFA	0D	06(6dB UP)	03(12dB UP)	When hex changes from "0D" to "06" or "03" gain increases by 6dB or 12dB for line1.
C-ID (FSK) sensitivity (LINE 2)		0F1C	0D	06(6dB UP)	03(12dB UP)	When hex changes from "0D" to "06" or "03" gain increases by 6dB or 12dB for line2.
Frequency		00 07 / 00 08	70/02	-	-	Use these items in a READ-ONLY mode to confirm the contents. Careless rewriting may cause serious damage to the computer system.
ID		00 02 ~ 00 06	Given value	-	-	
Bell /Melody length	for LINE1	0560	3C (6 sec)	-	-	This is time until bell stops ringing. time interval: 100 msec) When hex changes from "3C" to "32" length decreases from 6sec to 5sec.
	for LINE2	0B81	3C (6 sec)	-	-	This is time until bell stops ringing. time interval: 100 msec) When hex changes from "3C" to "32" length decreases from 6sec to 5sec.

8.1.2. Handset

Important:

Make sure the address on LCD is correct when entering new data. Otherwise, you may ruin the unit.



H/S key operation

- 1). Press [MENU].
- 2). Select "Initial setting" using [▲] or [▼] then press [SELECT] or [▶].
- 3). Enter "7", "2", "6", "2", "7", "6", "6", "4".
Note: 7262 7664 = PANA SONI
(see letters printed on dial keys)
- 4). Select "Write EEP" using [▲] or [▼] then press [SELECT] or [▶].

- 5). Enter "●", "●", "●", "●" (Address). (*1)

- 6). Enter "*", "*" (New Data). (*1)

- 7). Press [OK], a long confirmation beep will be heard.

- 8). Press [OFF] to return to standby mode.
After that, remove and reinsert the batteries.
Press the Power button for about 1 second if the power is not turned on.

H/S LCD

Service Mode	
Read EEP	
Write EEP	
BACK	SELECT

Set Addr.:	
●●●●	* *
← Default Data	
CLEAR	OK

Set Addr.:	
●●●●	* *
← New Data	
CLEAR	OK

Set Addr.:	
- - - - -	
BACK	

Note:

(*1) When you enter the address or New Data, please refer to the table below.

Desired Number (hex.)	Input Keys	Desired Number (hex.)	Input Keys
0	0	A	[Flash] + 0
1	1	B	[Flash] + 1
.	.	C	[Flash] + 2
.	.	D	[Flash] + 3
.	.	E	[Flash] + 4
9	9	F	[Flash] + 5

Frequently Used Items (Handset)

ex.)

Items	Address	Default Data	New Data	Possible Adjusted Value MAX (hex)	Possible Adjusted Value MIN (hex)	Remarks
Frequency	00 07 / 00 08	70 / 02	-	-	-	(*2)
ID	00 02 ~ 00 06	Given value	-	-	-	

(*2) Use these items in a READ-ONLY mode to confirm the contents. Careless rewriting may cause serious damage to the handset.

8.2. How to Clear User Setting

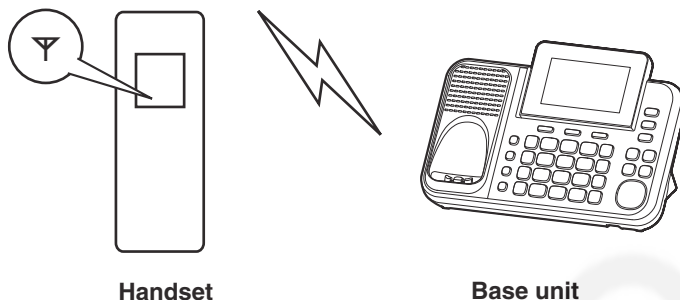
Units are reset to the Factory settings by this operation (Erase recorded Voice messages, stored Phone numbers, Caller list and etc.)

Note:

- Some menus are not reset. Refer to **Operating Instructions** (P.23).
- The reset menus differ depending on the following operations.
- **This operation should not be performed for a usual repair.**

8.2.1. Resetting both base unit and handset

Both the base unit and the registered handset which you did the following steps ① to ④ are reset. Other registered handsets will not be reset.



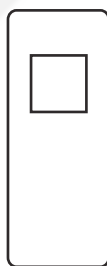
- ① Connect the AC adaptor to the base unit and install the charged batteries into the handset.
- ② Confirm the handset is registered to the base unit (Ƴ lights).
If the handset is not registered to the base unit (Ƴ lights), register it. (*1)
- ③ Lift the handset and press **[Ƴ 0]** to put the handset in standby mode.
- ④ Press **[1]**, **[5]**, **[9]** and **[*]** key of the handset simultaneously until a confirmation tone is heard.
- ⑤ Disconnect the AC adaptor, then remove the battery.

Note:

(*1) Refer to **Registering a Handset to a Base Unit** in the Operating Instructions.

8.2.2. Resetting only handset

The only handset is reset by doing the following steps ① to ④.



Portable

- ① Install the charged batteries into the Portable.
- ② Lift the portable and press **[OFF]** to put the portable in standby mode.
- ③ Press **[3]**, **[5]**, **[7]** and **[#]** key of the portable simultaneously until a confirmation tone is heard. (*2)
- ④ Remove the battery.

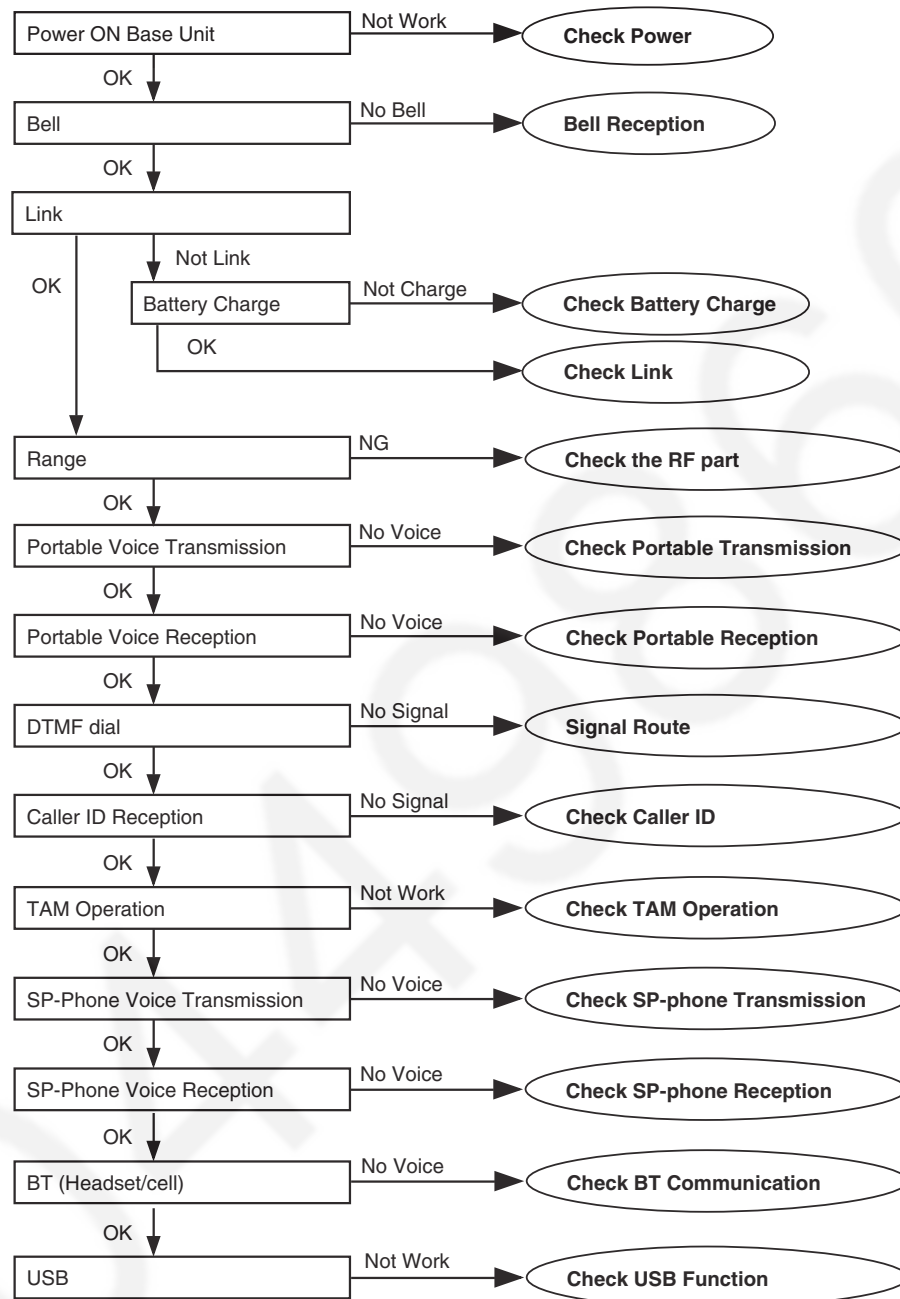
Note: (*2)

- The handset registration to the base unit is cancelled.
- If the handset needs to be registered to the base unit, refer to **Registering a Handset to a Base Unit** in the Operating Instructions.
- If users do not bring the base unit with them, the registration procedure has to be done by users themselves.

9 Troubleshooting Guide

9.1. Troubleshooting Flowchart

Flow Chart



Cross Reference:

Check Power (P.30)

Bell Reception (P.39)

Check Battery Charge (P.32)

Check Link (P.33)

Check the RF part (P.35)

Check Handset Transmission (P.38)

Check Handset Reception (P.38)

Signal Route (P.18)

Check Caller ID (P.38)

Check TAM Operation (P.39)

Check SP-phone Transmission (P.40)

Check SP-phone Reception (P.40)

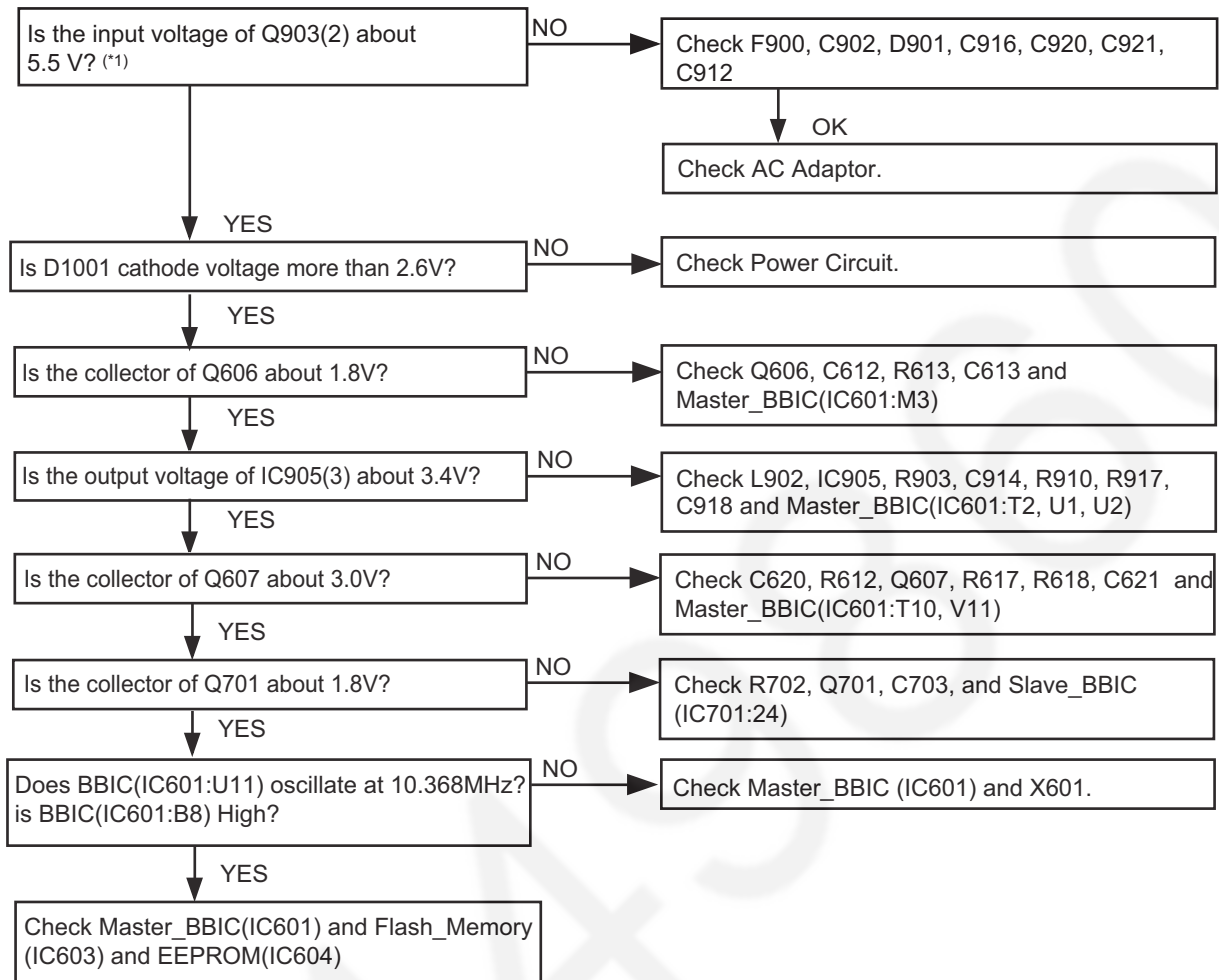
Check BT Communication (P.41)

Check USB Function (P.40)

9.1.1. Check Power

9.1.1.1. Base Unit

9.1.1.1.1. Adapter starting



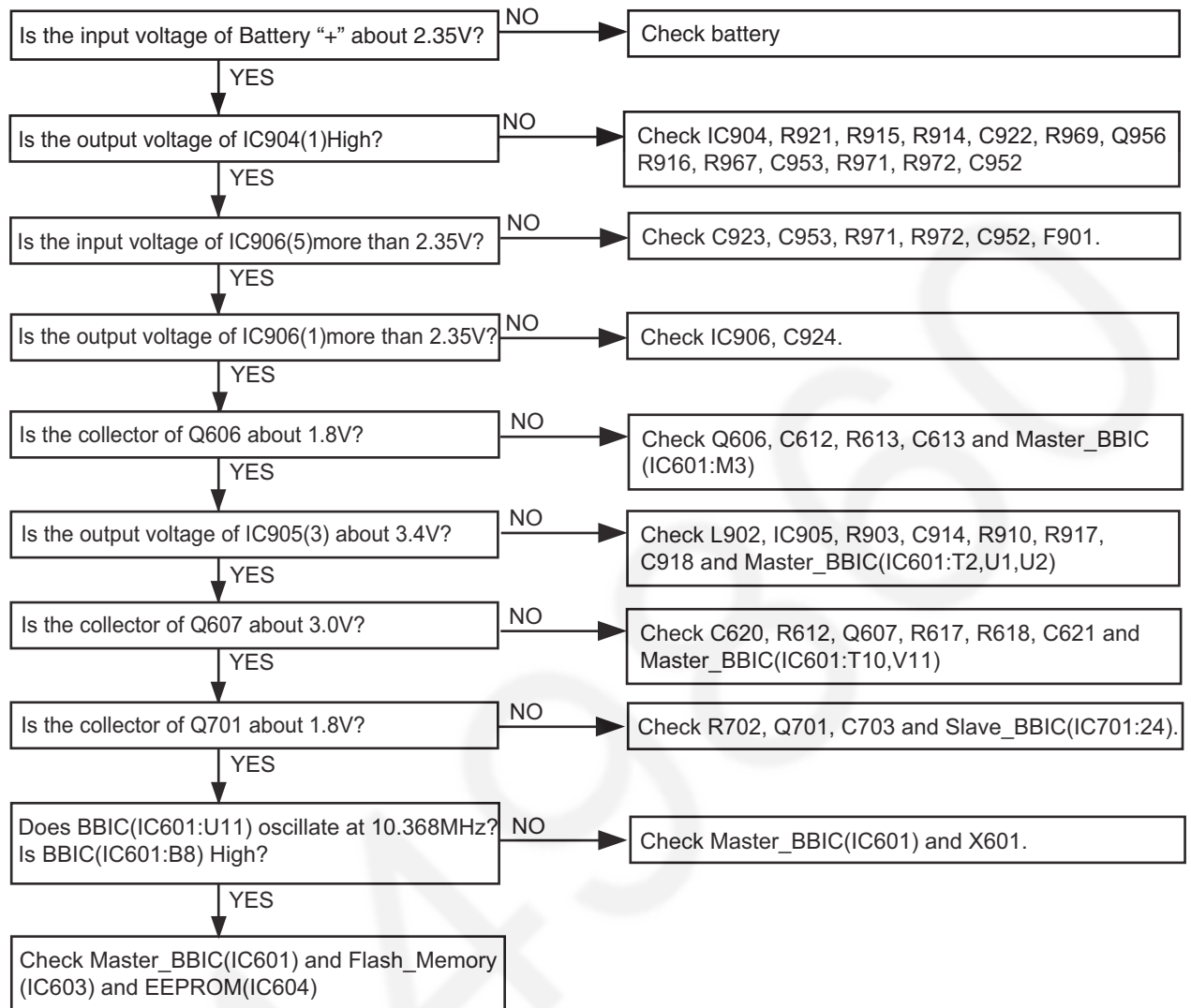
Note:

(*1) Refer to **Specifications** (P.7) for part number and supply voltage of AC adaptor.

Cross Reference:

Power Supply Circuit (P.10)

9.1.1.1.2. Battery starting



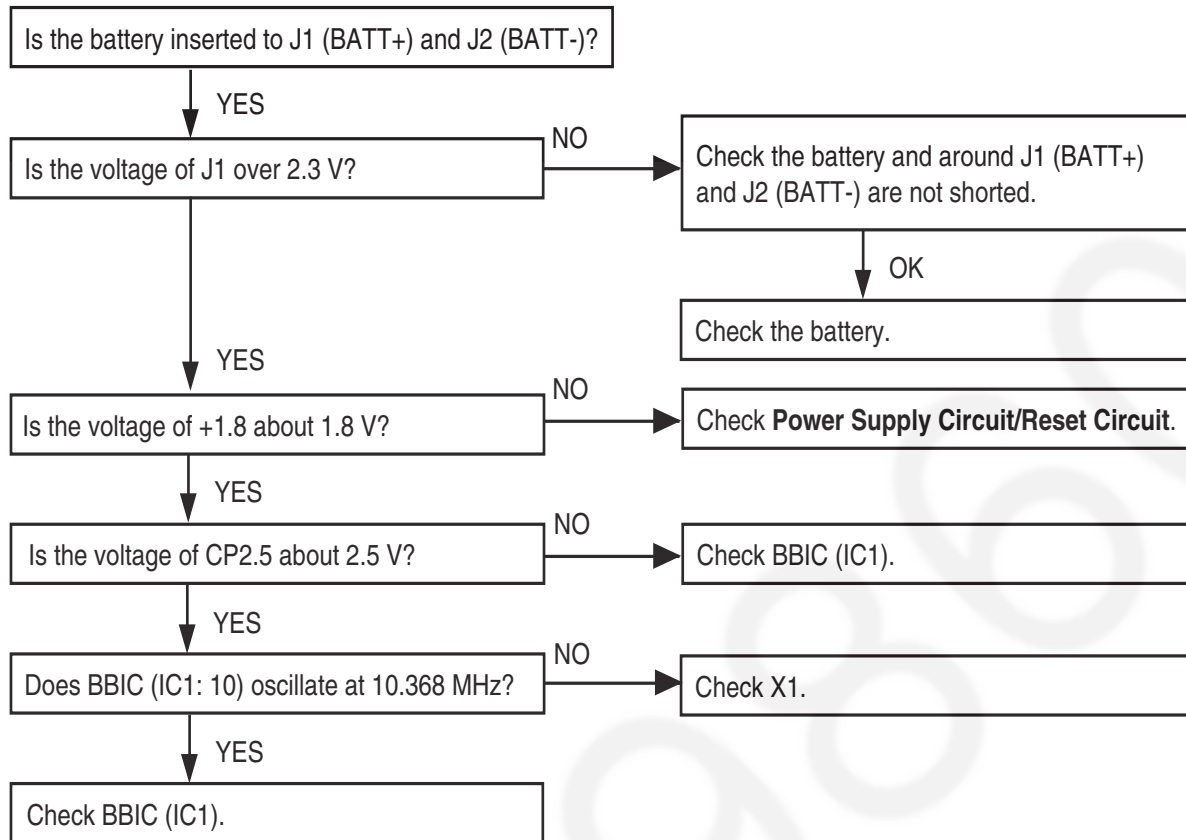
Note:

(*1) Refer to **Specifications** (P.7) for part number and supply voltage of AC adaptor.

Cross Reference:

Power Supply Circuit (P.10)

9.1.1.2. Handset

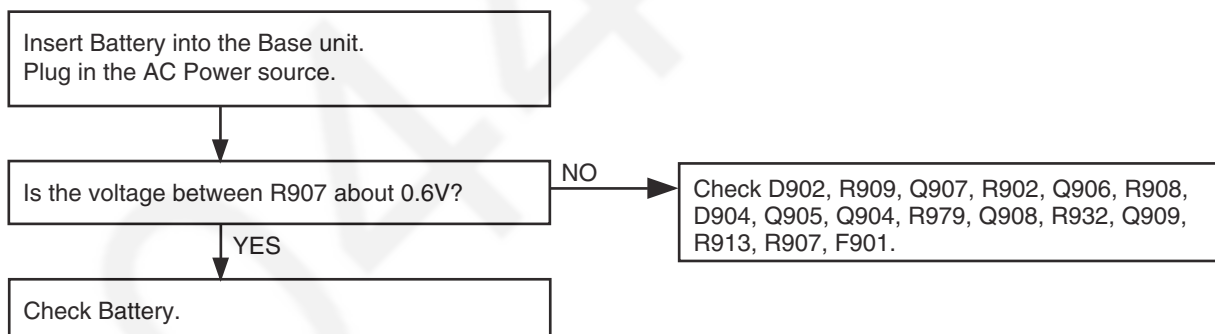


Cross Reference:

Power Supply Circuit/Reset Circuit (P.16)

9.1.2. Check Battery Charge

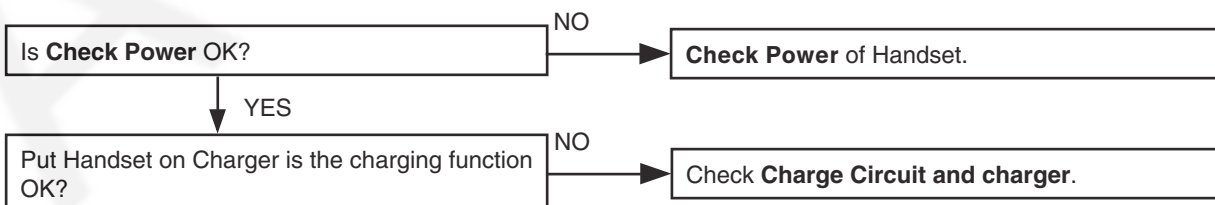
9.1.2.1. Base Unit



Cross Reference:

Charge Circuit (P.16)

9.1.2.2. Handset



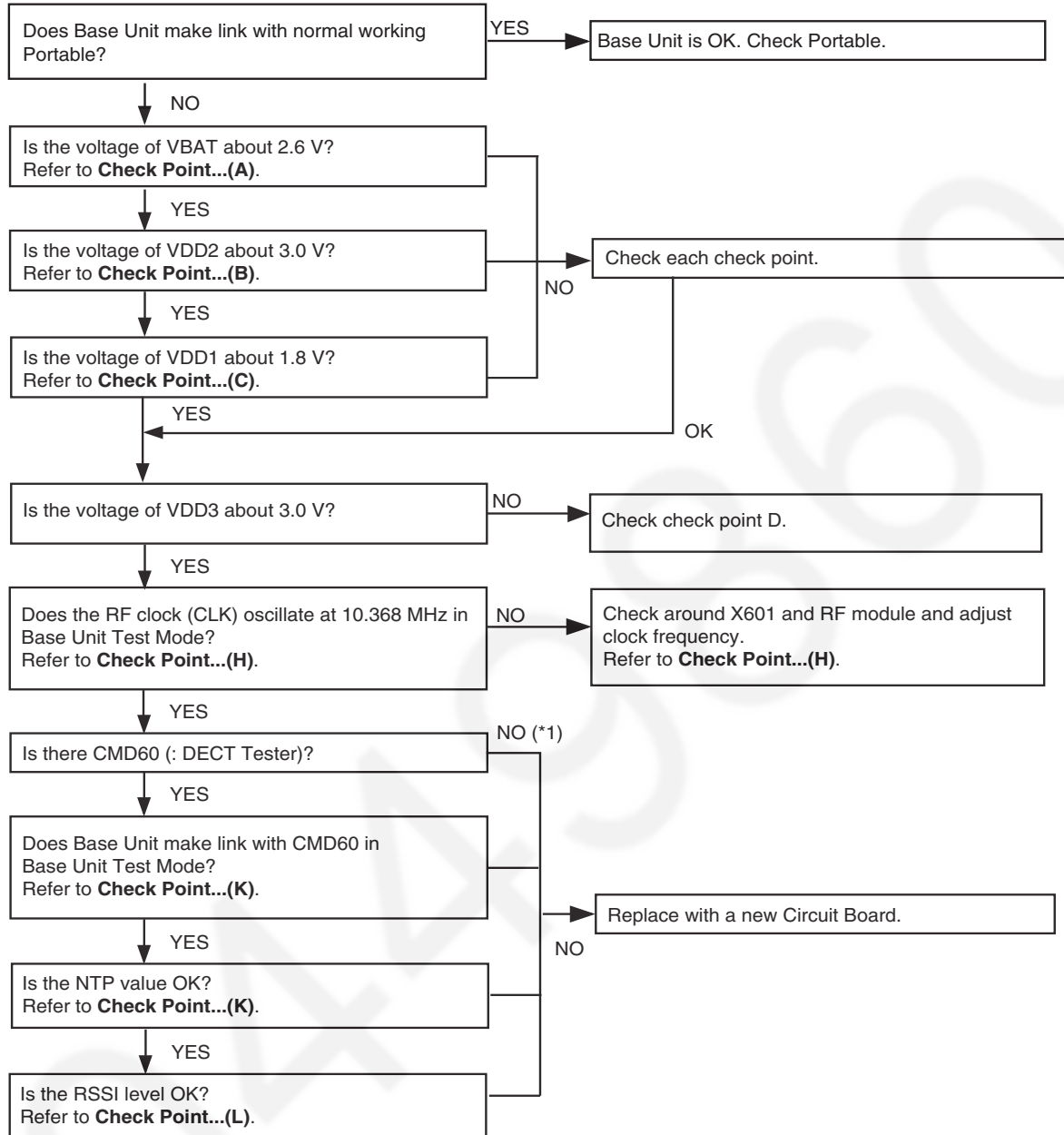
Cross Reference:

Check Power (P.30)

Charge Circuit (P.16)

9.1.3. Check Link

9.1.3.1. Base Unit



Cross Reference:

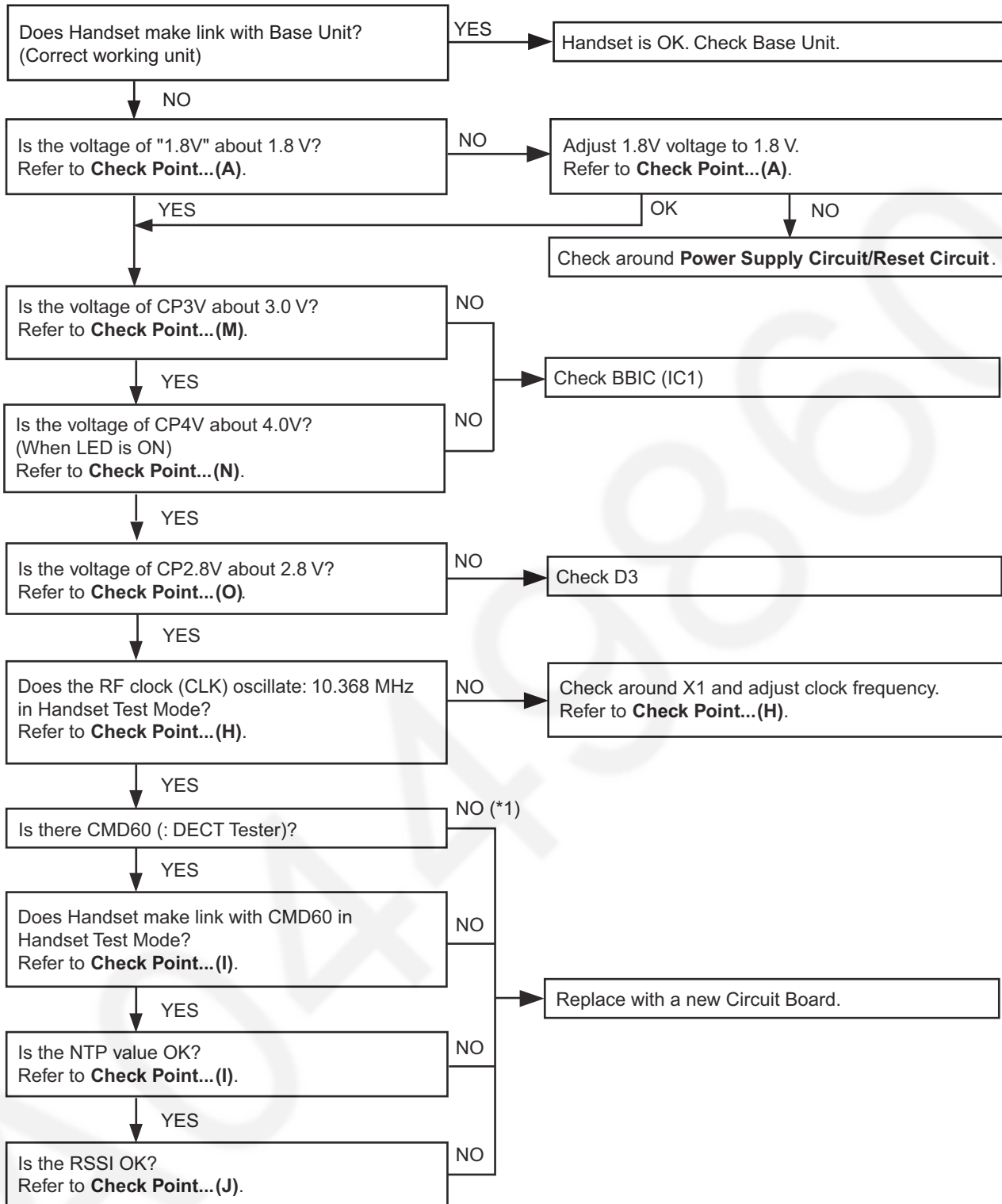
Power Supply Circuit (P.10)

Check Point (Base Unit) (P.43)

Note:

(*1) Refer to **Troubleshooting by Symptom (Base Unit and Charger Unit)** (P.43).

9.1.3.2. Handset



Note:

(*1) Refer to **Troubleshooting by Symptom (Handset)** (P.45)

Cross Reference:

Check Point (Handset) (P.45)

Power Supply Circuit/Reset Circuit (P.16)

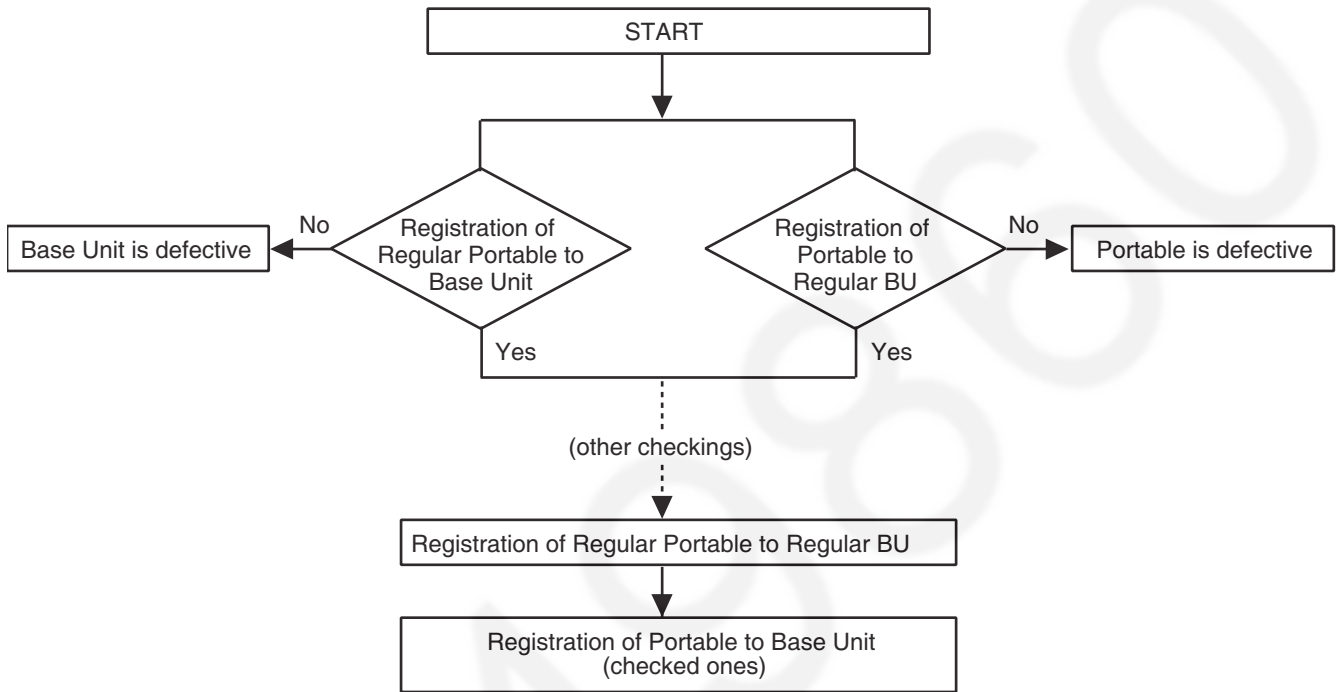
9.1.4. Check the RF part

9.1.4.1. Finding out the Defective part

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



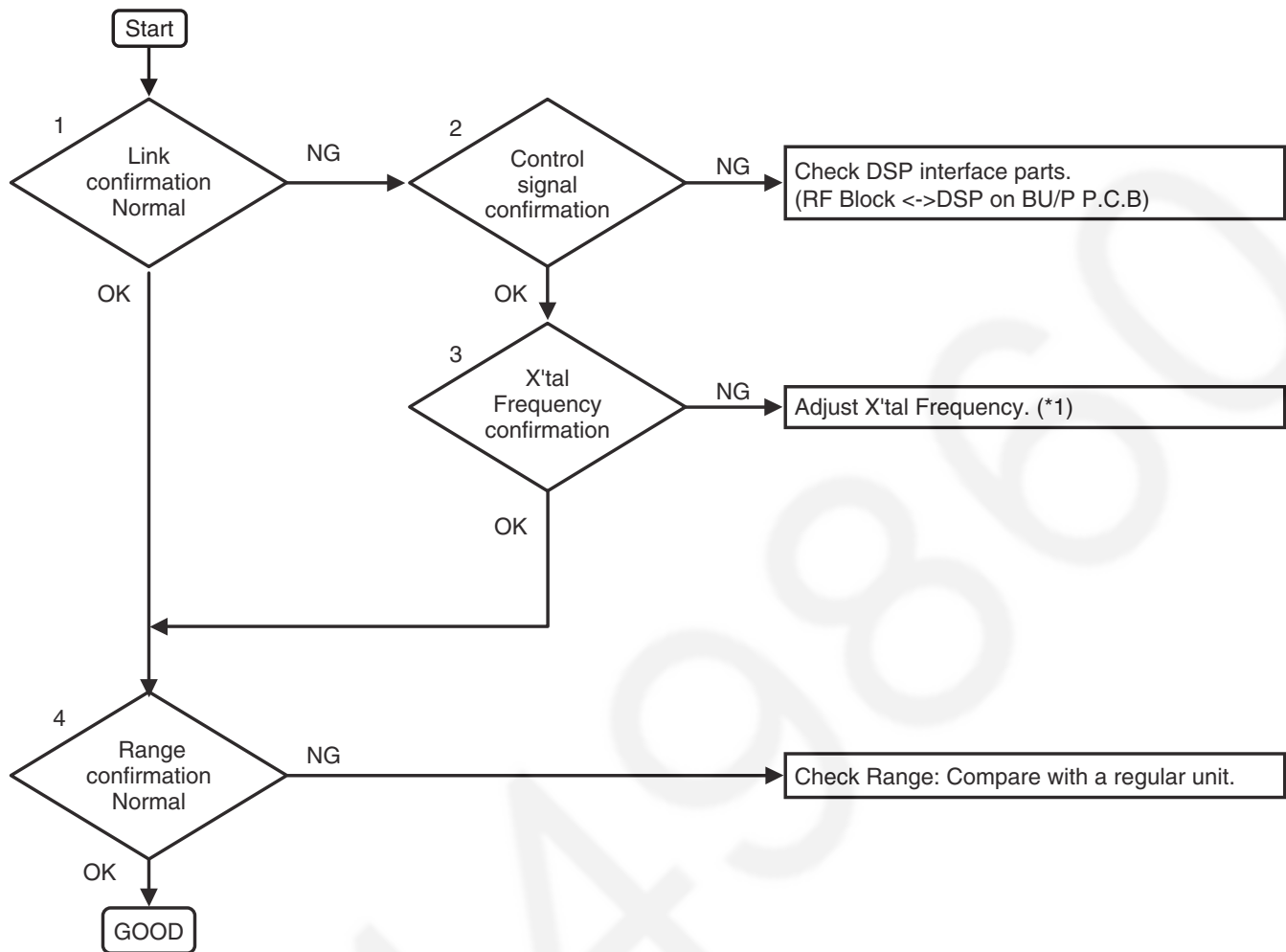
Note:

If you need to register a handset, refer to **Registering a Handset to a Base Unit** in the Operating Instructions.

9.1.4.2. RF Check Flowchart

Each item (1 ~ 3) of RF Check Flowchart corresponds to **Check Table for RF part** (P.37).

Please refer to the each item.



Note:

(*1) Base unit - refer to (E) of **Check Point (Base Unit)** (P.43)

Handset - refer to (H) of **Check Point (Handset)** (P.45)

9.1.4.3. 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	X'tal Frequency confirmation HS, BU Mode: [Test mode]	1. Check X'tal Frequency. (*1) (13.824 MHz $\pm$ 100 Hz)	1. Check X'tal Frequency. (*2) (10.368 MHz $\pm$ 100 Hz)
3	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) Refer to **Adjustment Standard (Base Unit)** (P.58)

(*2) Refer to **Adjustment Standard (Handset)** (P.61)

9.1.5. Check Handset Transmission

Check MIC of Portable.



Check CDL TX (Portable) in **Signal Route**.

Cross Reference:

Signal Route (P.18)

9.1.6. Check Handset Reception

Check Portable Speaker in **How to Check the Portable Speaker or Receiver**.



Check CDL RX (Portable) in **Signal Route**.

Cross Reference:

How to Check the Portable Speaker or Receiver (P.68)

Signal Route (P.68)

9.1.7. Check Caller ID

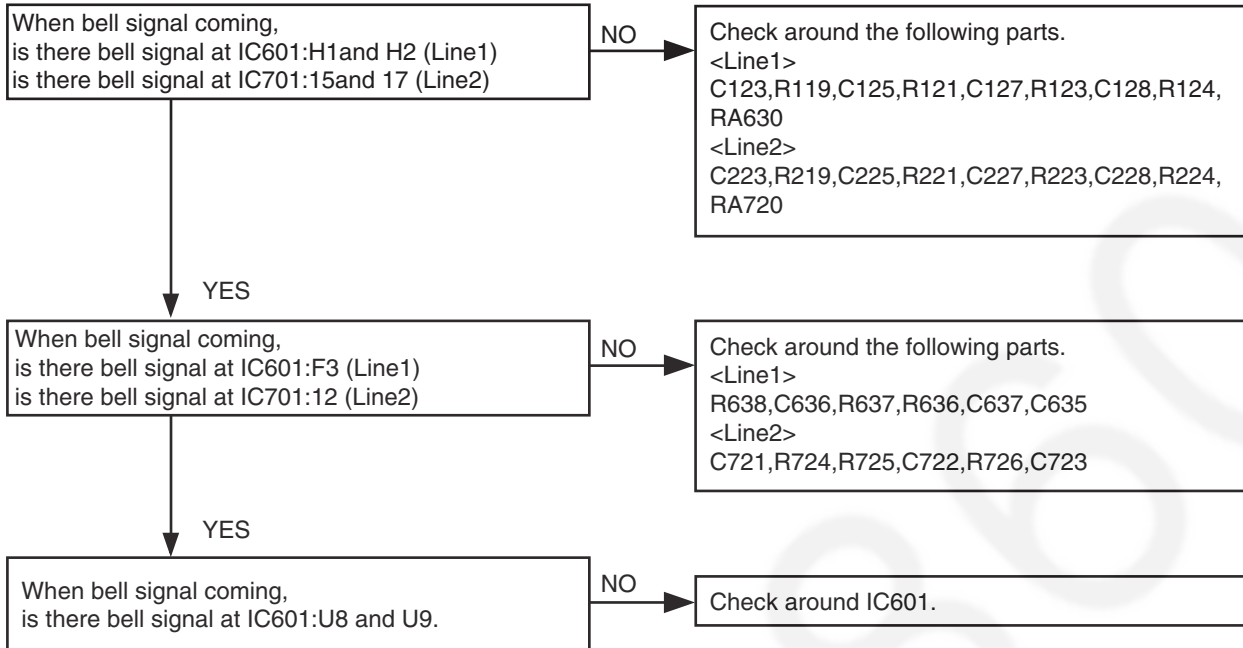
Check Caller ID in **Signal Route**.

Cross Reference:

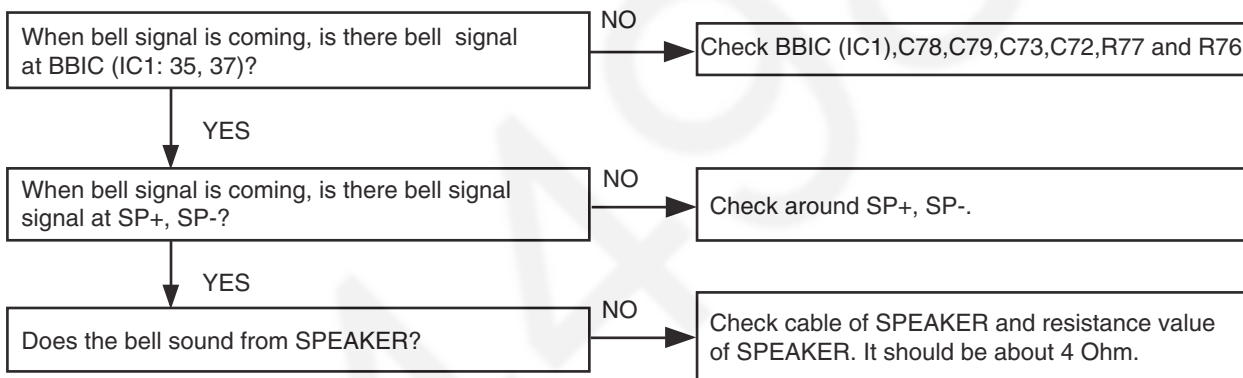
Signal Route (P.18)

9.1.8. Bell Reception

9.1.8.1. Base Unit



9.1.8.2. Handset



Cross Reference:

Telephone Line Interface (P.13)

Check Link (P.33)

How to Check the Portable Speaker or Receiver (P.68)

9.1.9. Check TAM Operation

Check IC602, and Master BBIC (IC601)
of Base Unit. (*1)

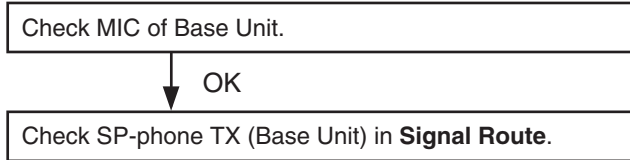
Cross Reference:

Power Supply Circuit (P.10)

Note:

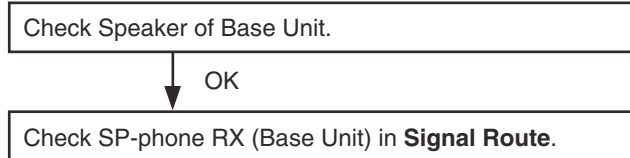
(*1) When replacing FLASH MEMORY (IC602), TAM data needs to be written to it. Refer to **How to download the data** (P.62) of **Things to Do after Replacing IC**.

9.1.10. Check SP-phone Transmission



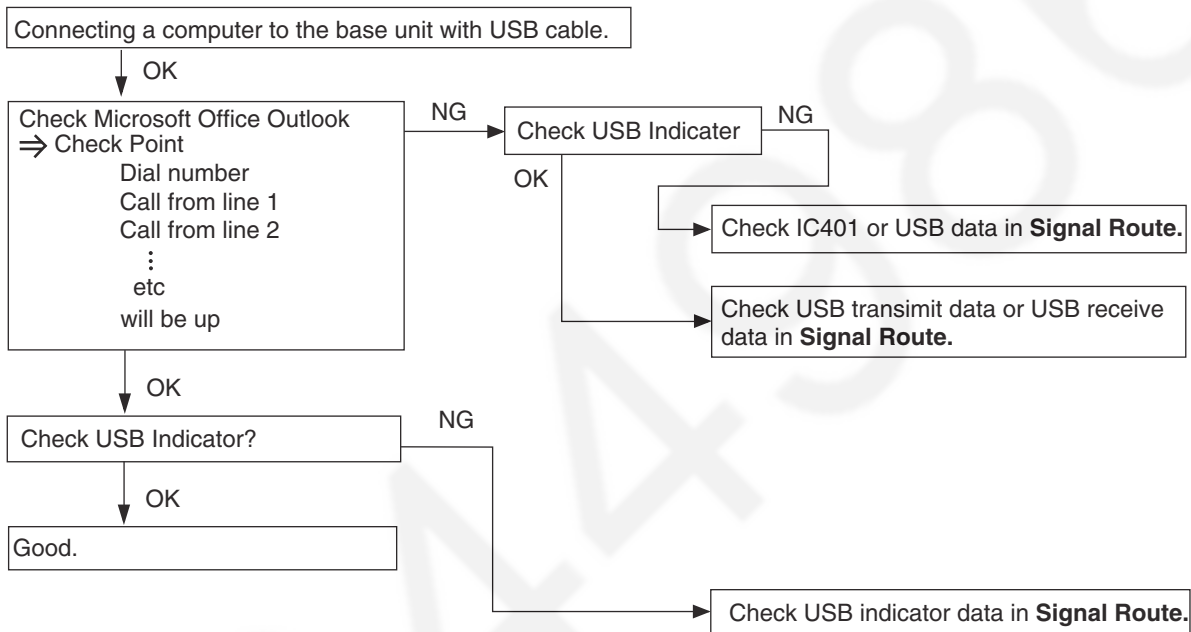
Cross Reference:
Signal Route (P.18)

9.1.11. Check SP-phone Reception



Cross Reference:
Signal Route (P.18)

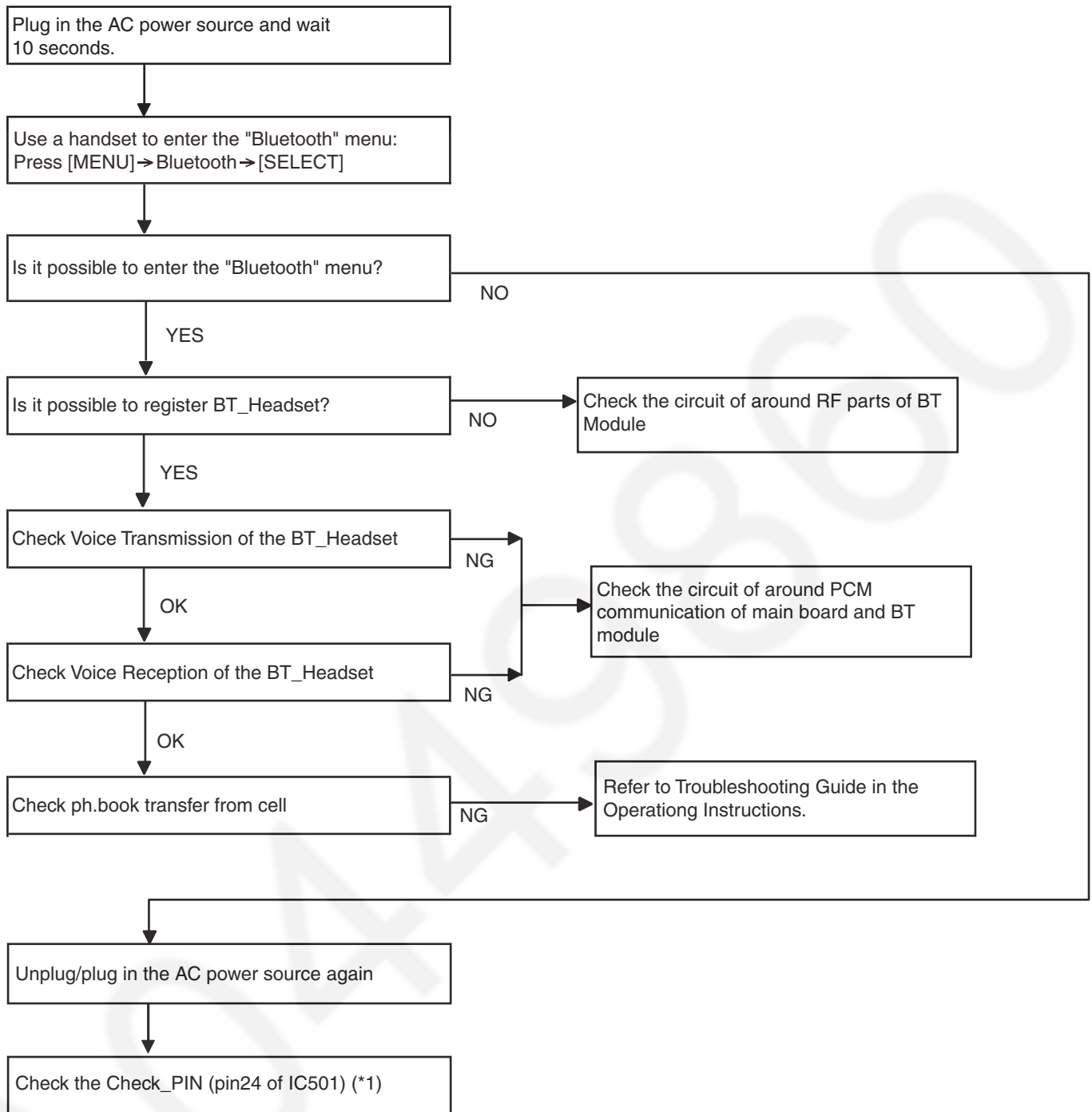
9.1.12. Check USB Function

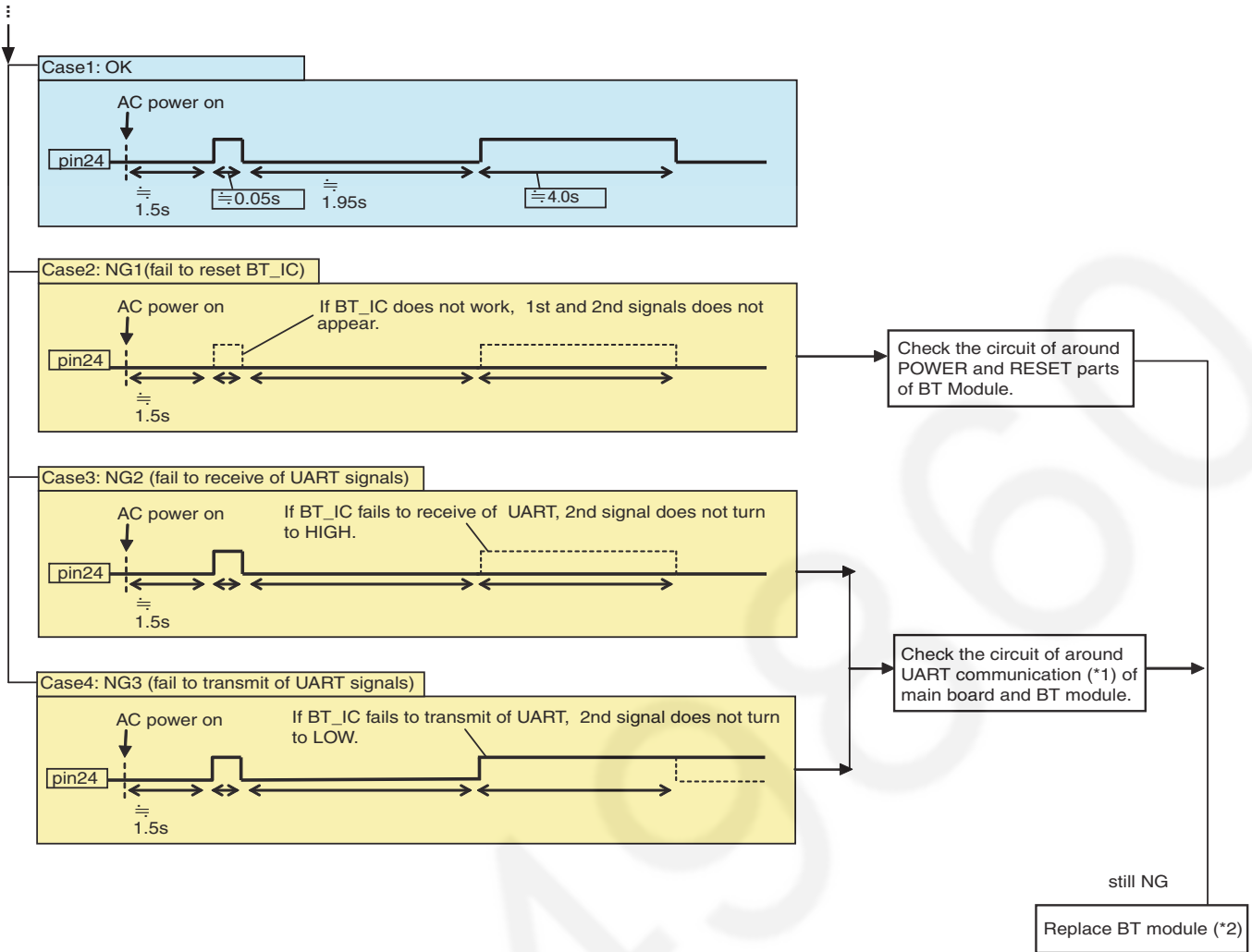


Cross Reference:
Signal Route (P.18)

Note:
 When replacing USB (IC401), VID and PID and Product string need to be written to it. Refer to () of Things to Do after Replacing IC

9.1.13. Check BT Communication





Cross Reference:

Component View (P.87)

Note:

(*1) Refer to **Bottom View** (P.88)

(*2) After replacing, need to adjust the frequency of BT.

Refer to **Things to Do after Replacing IC or X'tal** (P.62)

9.2. Troubleshooting by Symptom (Base Unit and Charger Unit)

9.2.1. Check Point (Base Unit)

Please follow the items below when BBIC, EEPROM or FLASH is replaced.

Note:

After the measuring, suck up the solder of TP.

The connections of simulator equipment are as shown in **Adjustment Standard (Base Unit)** (P.58).

	Items	Check Point	Procedure	Check or Replace Parts				
(A)	VBAT Supply Confirmation	VBAT	1. Confirm that the voltage between test point VBAT and GND is 2.6 V ± 0.2V.	IC341, F301, F900, D901, Q903, IC901, L901, D1001, IC904 C341, C342, C386				
(B)	3.0V Supply Confirmation	VDD2	1. Confirm that the voltage between test point VDD2 and GND is 3.0 V ± 0.2 V.	IC601, Q607, L902, IC905				
(C)	1.8V Supply Confirmation	VDD1	1. Confirm that the voltage between test point VDD1 and GND is 1.8 V ± 0.2 V.	IC601, Q606				
(D)	2.8V Supply Confirmation	VDD3	1. Confirm that the voltage between test point VDD3 and GND is 3.0V ± 0.2 V.	IC601, Q607, L902, IC905, D603				
(E)	+1.8V Supply Confirmation	VDD5	1. Confirm that the voltage between test point VDD5 and GND is 1.8V ± 0.2V.	IC701, Q701				
(F)*	BBIC Confirmation	-	1. BBIC Confirmation (Execute the command "getchk"). 2. Confirm the returned checksum value. Connection of checksum value and program number is shown below. ex.) <table><tr><td>checksum value</td><td>program number</td></tr><tr><td>E423</td><td>JGU1AA</td></tr></table>	checksum value	program number	E423	JGU1AA	IC601, X601
checksum value	program number							
E423	JGU1AA							
(G)*	EEPROM Confirmation	-	1. EEPROM Confirmation (Execute the command "sendchar EPV"). 2. Confirm the returned value.(Value for reference is written at "EEPROM C/SUM" in Software_Version_Table.xls).	IC604, R644, C607, C629				
(H)*	BBIC Clock Adjustment	CLK	1. Check X'tal Frequency. (10.368 MHz ± 100 Hz). Input Command "rdeeprom 00 01 01", then you can confirm the current value. 2. If the frequency is not 10.368 MHz ± 100 Hz, Adjust the frequency of CLK executing the command "setfreq xx (where xx is the value)" so that the reading of the frequency counter is 10.368000 MHz ± 100 Hz.	IC601, X601				
(I)*	Hookswitch Check with DC Characteristics	-	1. Connect Tel_Jack 1 (Line 1)/Tel_Jack 2 (Line 2) (Telephone Socket) to Tel-simulator which is connected with 600 Ω. 2. Set line voltage to 48 V and line current to 40 mA at off-hook condition of normal telephone. 3. Execute the command "hookoff" 4. Confirm that the line current is 40 mA ± 5 mA. 5. Execute the command "hookon". 6. Confirm that the line current is less than + 0.8 mA.	<Line 1> PO101,D101, Q101, R103, Q102, Q103, R108 <Line 2> PO201,D201, Q201, PC201, Q203, R203, R208				
(J)	DTMF Generator Check	-	1. Connect Tel_Jack 1 (Line 1)/Tel_Jack 2(Line 2) (Telephone Socket) to DTMF tester. (Road=600 Ω) 2. Link Portable and push dial key. 3. Confirm DTMF character. 4. Confirm that the high Group is -6 dBm ± 2 dBm. 5. Confirm that the low Group is -8 dBm ± 2 dBm.	<Line 1> IC601(K3), C112, Q103, R111, Q101, D101, PO101 <Line 2> IC701(21), C218, R215, T202, C212, R210, R211, Q201, D201, P201				

	Items	Check Point	Procedure	Check or Replace Parts
(K)*	Transmitted Power Confirmation	-	Remove the Antenna before starting step from 1 to 7. 1. Configure the DECT tester (CMD60) as follows; <Setting> • Short A_1 and GND. • Test mode: FP • Traffic Carrier: 2 • Traffic Slot: 4 • Mode: Loopback • PMID: 00000 • RF LEVEL = -70 dBm. 2. Execute the command "testmode". 3. Execute the command "sendchar dmv 2 2". 4. Check that "Signalling Status" has been set to "Locked", then press "ACCEPT RFPI". 5. Initiate connection from Dect tester ("set up connect") 6. Execute the command "ANT2". 7. Confirm that the NTP value at ANT is 17dBm ~ 20.5 dBm.	DA501, C509, C507, C501, C503, C510, C508, C506, C500
(L)*	RSSI Level Confirmation	-	Follow steps 1 to 6 of (K). 7. Execute the command "readrssi". 8. Confirm that the returned value is 21 ± A (hex).	DA501, C509, C507, C501, C503, C510, C508, C506, C500
(M)	Audio Check	-	1. Link with Portable. 2. Input -45 dBm/1kHz to MIC of Portable. Measure the Level at Line I/F and distortion level. 3. Confirm that the level is -8 dBm ± 2 dBm and that the distortion level is < 5 % at TEL Line (600 Ω Load). 4. Input -20 dBm/1 kHz to Line I/F. Measure the level at Receiver of Portable and distortion level (*Receive volume set to second position from minimum). 5. Confirm that the level is -25 dBm ± 2 dBm and that the distortion level is < 5 % at Receiver (Volume Middle, 150 Ω Load).	<Line1> IC601, C112, Q103, R111, Q101, D101, PO101, R105, C121, R135 <Line2> IC701(21)C218, T202, R215, C212, R210, R211, Q201, D201, PO201, R205, C205, T201, R236, C221
(N)*	TAM Operation Confirmation	-	1. TAM Confirmation (Execute the command "sendchar_VPI") 2. Confirm the returned Value (Value is "JGT7AA 03").	IC602, R624, C601

9.3. Troubleshooting by Symptom (Handset)

If your unit has below symptoms, follow the instructions in remedy column. Remedies depend on whether you have DECT tester (*1) or not.

Symptom	Remedy (*2)	
	You don't have DECT Tester.	You have DECT Tester. (Model Number: CMD60)
Battery strength is not indicated correctly by Battery icon.	Check item (A) - (D), (E) - (G).	Check item (A) - (D), (E) - (G).
You cannot hear the caller's voice.	Check item (A) - (C), (H), (N).	Check item (A) - (C), (H - (J)) - (K).
You cannot use handset little away from base unit even if the handset is within range of the base unit.	-	Check item (I) - (J).
the Audio level is high or low.	Check item (K).	Check item (K).
The SP-Phone level is high or low.	Check item (L).	Check item (L).

Note:

(*1) A general repair is possible even if you don't have the DECT tester because it is for confirming the levels, such as Acoustic level in detail.

(*2) Refer to **Check Point (Handset)** (P.45)

9.3.1. Check Point (Handset)

Please follow the items below when BBIC or EEPROM is replaced.

Note:

After the measuring, suck up the solder of TP.

*: **The Setting Method of JIG (Handset)** (P.59) is required beforehand.

The connections of adjustment equipment are as shown in **Adjustment Standard (Handset)** (P.61).

	Items	Check Point	Procedure	Check or Replace Parts				
(A)*	1.8 V Supply Adjustment	1.8V	1. Confirm that the voltage between test point 1.8V and GND is 1.8 V ± 0.02 V. 2. Execute the command “VDD”, then check the current value. 3. Adjust the 1.8V voltage of 1.8V executing command “VDD XX”(XX is the value).	IC1, Q1, C44, R45, C40, C45, F1				
(B)*	BBIC Confirmation	-	1. BBIC Confirmation (Execute the command “getchk”). 2. Confirm the returned checksum value. Connection of checksum value and program number is shown below. ex.) <table><tr><td>checksum value</td><td>program number</td></tr><tr><td>F24F</td><td>JGV2AB</td></tr></table>	checksum value	program number	F24F	JGV2AB	IC1, X1, R61
checksum value	program number							
F24F	JGV2AB							
(C)*	EEP-ROM Confirmation	-	1. EEP-ROM Confirmation (Execute the command "sendchar EPV"). 2. Confirm the returned Value. (Value for reference is written at "EEPROM C/ SUM" in Software_Version_Table.xls).	IC1, IC3, RA5, C69				
(D)	Charge Control Check & Charge Current Monitor Check	-	1. Apply 5.0 V between CHG(+) and CHG(-) with DC power supply and set current limit to 150 mA. Confirm the indication of “charging” on LCD. 2. Confirm that the current limit LED of DC power supply is ON/OFF. Confirm it after waiting over 1 minute at least. (If charge control cannot be confirmed by this procedure, please use battery to handset power supply and try again.)	IC1, Q4 Q9, Q2, Q3, R2, R7, R8, R6, R9, C19, F1, R45				
(E)*	Charge Detection (OFF) Check	-	1. Stop supplying 5.0 V to CHG (+) and CHG (-). 2. Confirm the indication of “charging” has been cleared.	IC1, Q4 Q9, Q2, Q3, R2, R7, R8, R6, R9, C19, F1, R45				

	Items	Check Point	Procedure	Check or Replace Parts
(F)*	Battery Monitor Check	-	1. Apply 2.25 V between BATT+ and BATT-. 2. Execute the command sendchar PAD sendchar LED 0 sendchar CRX 0 1 sendchar AD1 It assumes that the return value is XX. a) XX: 70: No need to adjust b) XX: 66 ~ 6F: Need to adjust XX: 71 ~ 7A: Need to adjust Write AD value of 2.25 V to EEPROM. ex) read data: XX = 6A, write data: YY = 6A read data: XX = 73, write data: YY = 73 EEPROM = 0009(Low Voltage) write "YY" Execute the command "wreeprom 00 09 01 YY". EEPROM = 000A(No Voltage) write "YY -C" Execute the command "wreeprom 00 0A 01 ZZ". Note: ZZ = YY - C c) XX: 00 ~ 65: Reject XX: 7B ~ FF: Reject	IC1, F1, R45
(G)	Battery Low Confirmation	-	1. Apply 2.40 V between BATT+ and BATT-. 2. Confirm that there is no flashing of Battery Icon. 3. Apply 2.25 V $\pm$ 0.08 V between BATT+ and BATT-. 4. Confirm that there is flashing of Battery Icon.	IC1, F1, R45
(H)*	BBIC Clock Adjustment	CKM	1. Apply 2.6 V between BATT+ and BATT- with DC power. 2. Input Command "sendchar sfr", then you can confirm the current value. 3. Check X'tal Frequency. (10.368 MHz $\pm$ 100 Hz). 4. If the frequency is not 10.368 MHz $\pm$ 100 Hz, adjust the frequency of CKM executing the command "sendchar sfr xx xx (where xx is the value)" so that the reading of the frequency counter is 10.368000 MHz $\pm$ 5 Hz. Note: Clear the registered information for Base Unit before measurement, because the Frequency will not possibly get stable due to the registered information. Pressing the button of "3" "5" "7" "##" clears the registration. Register to it on Base Unit after measurement.	IC1, X1, C47
(I)*	Transmitted Power Confirmation	-	Short Antenna pattern to GND. 1. Configure the DECT tester (CMD60) as follows; <Setting> • Test mode: PP • RFPI: 0102030405 • Traffic Carrier: 5 • Traffic Slot: 4 • Mode: Loopback • RF LEVEL = -70 dBm • PACKET: PP32Z 2. Execute the command "sendchar TST 01 02 03 04 05". 3. Initiate connection from DECT tester. 4. Confirm that the NTP value at ANT is 19 dBm ~ 25 dBm.	IC1, C801, C859, C860, C861, C862
(J)*	RSSI Level Confirmation	-	Follow steps 1 to 3 of (I). 4. Execute the command "read RSSI" 5. Confirmed that the returned value is 21 A (hex)	Refer to (I)
(K)	Audio Check and Confirmation	-	1. Link to BASE which is connected to Line Simulator. 2. Set line voltage to 48 V and line current to 50 mA. 3. Input -45 dBm (600 Ω)/1 kHz to MIC of Handset. Measure the Level at Line I/F and distortion level. 4. Confirm that the level is -3 dBm $\pm$ 5 dB and that the distortion level is < 5 % at TEL Line (600 Ω Load). 5. Input -20 dBm (600 Ω)/1 kHz to Line I/F. Measure the Level at Receiver of Handset and distortion level (Receive volume set to second position from minimum). 6. Confirm that the level is -27 dBm $\pm$ 4 dB and that the distortion level is < 5 % at Receiver (34 Ω Load).	IC1, C12, RA7, C11, C13, MIC, R23, C42, C70, C71
(L)	SP phone Audio Check and Confirmation	-	1. Link to Base which is connected to Line Simulator. 2. Set line voltage to 48 V and line current to 50 mA. 3. Set the handset off-hook using SP-Phone key. 4. Input -30 dBm (600 Ω)/1 KHz to Line I/F and measure Receiving level at SP+ and SP-. 5. Confirm that the level is -7 dBm $\pm$ 3 dB and that the distortion level is < 5 %. (vol = Max at SP (8 Ω Load))	IC1, C72, C73, C78, C79, R76, R77

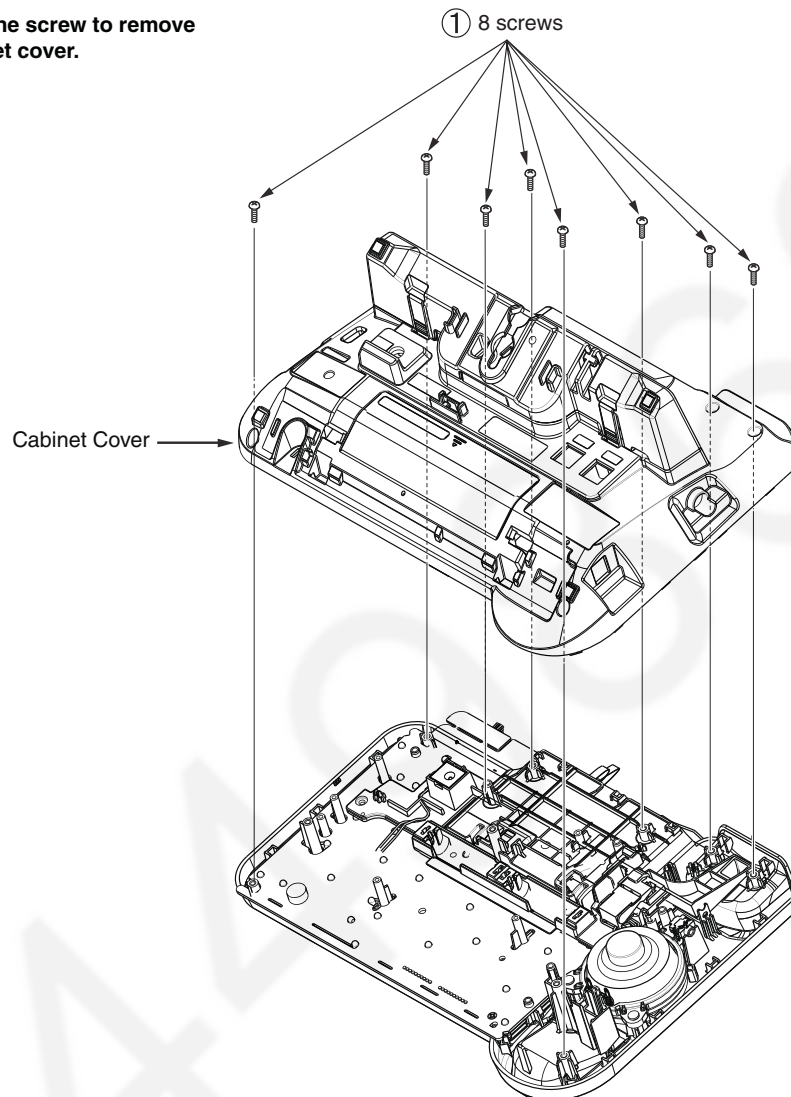
	Items	Check Point	Procedure	Check or Replace Parts
(M)	Charge Pump 3.0 V Supply Confirmation	CP3V	1. Confirm that the voltage between testpoint CP3.0V and GND is $3.0\text{ V} \pm 0.3\text{ V}$.	C30, C53, C29
(N)	Charge Pump CP 4.0V Supply Confirmation	CP4V	1. Confirm that the voltage between testpoint CP4V and GND is $4.0\text{ V} \pm 0.3\text{ V}$. (Power is supplied when LED is on)	C52, C55
(O)	Charge Pump CP2.8V Supply Confirmation	CP2.8V	1. Confirm that the voltage between testpoint CPV2.8V and GND is $2.8\text{ V} \pm 0.3\text{ V}$.	C30, C53, C29, D3, C51

10 Disassembly and Assembly Instructions

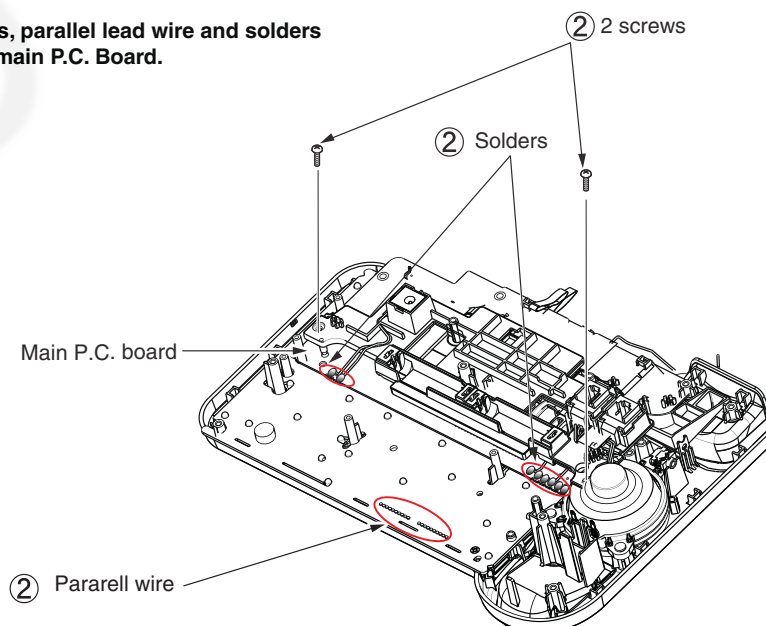
10.1. Disassembly Instructions

10.1.1. Base Unit

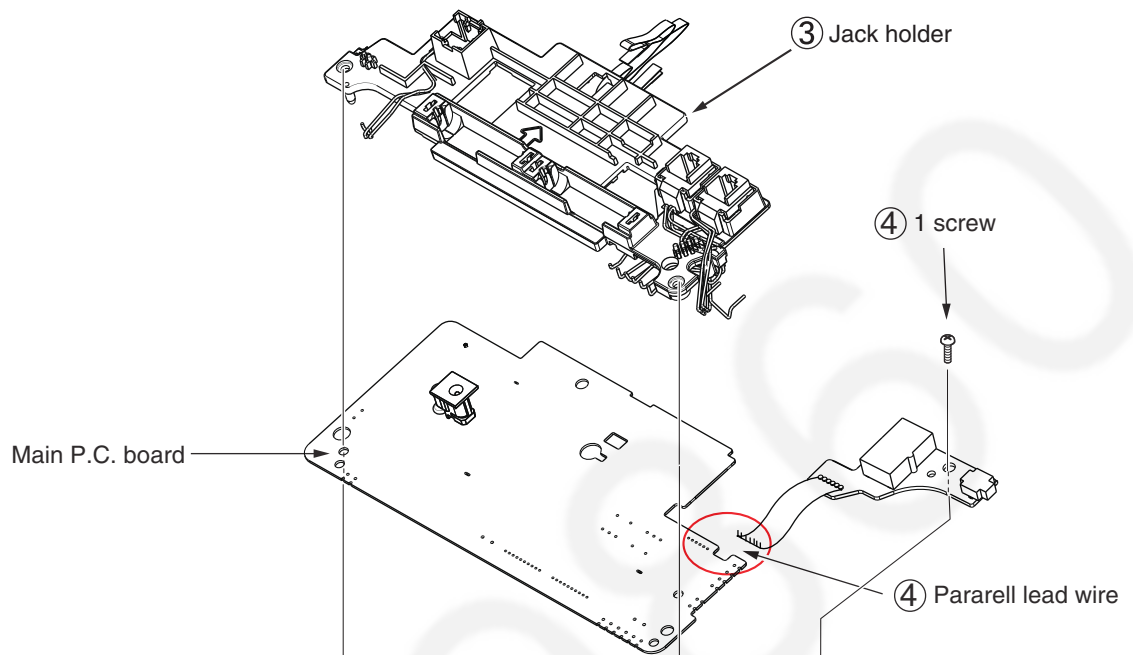
- ① Remove the screw to remove the cabinet cover.



- ② Remove screws, parallel lead wire and solders to remove the main P.C. Board.

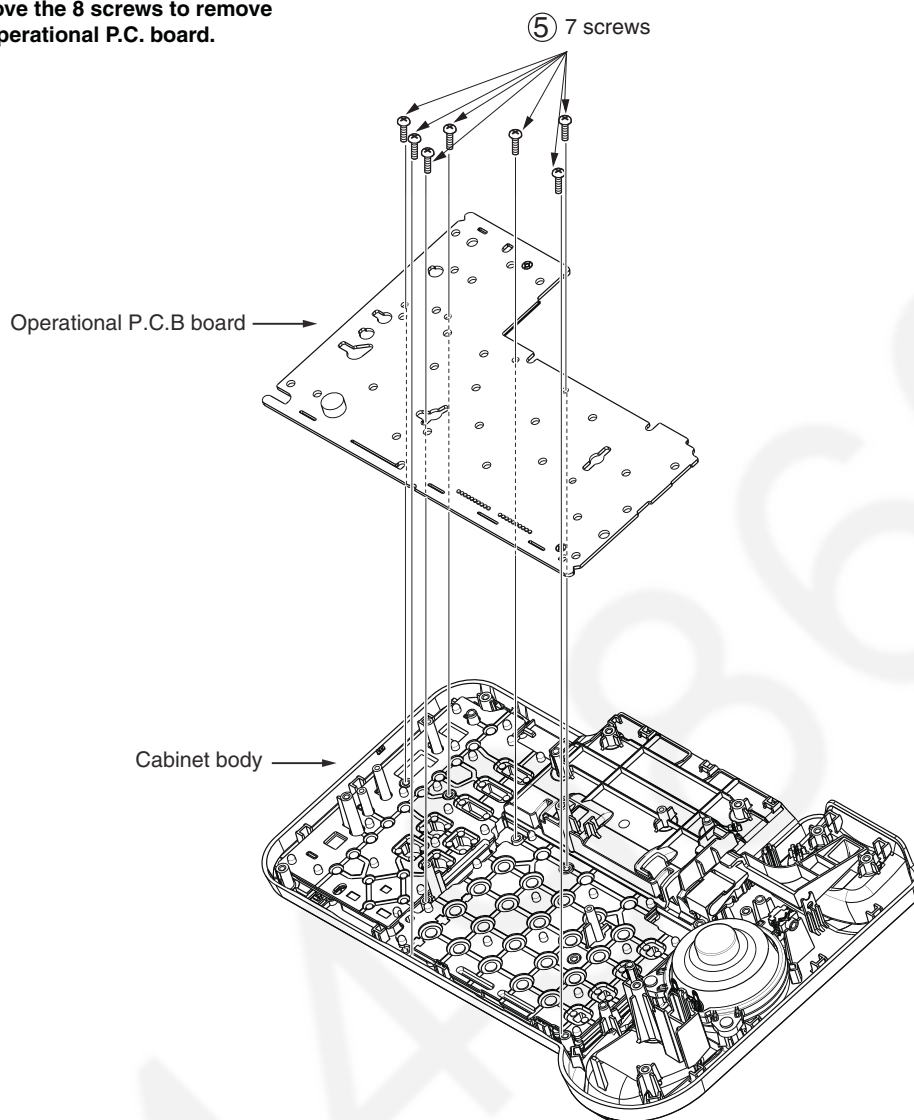


- ③ Remove the Jack holder to remove the Main P.C Board.

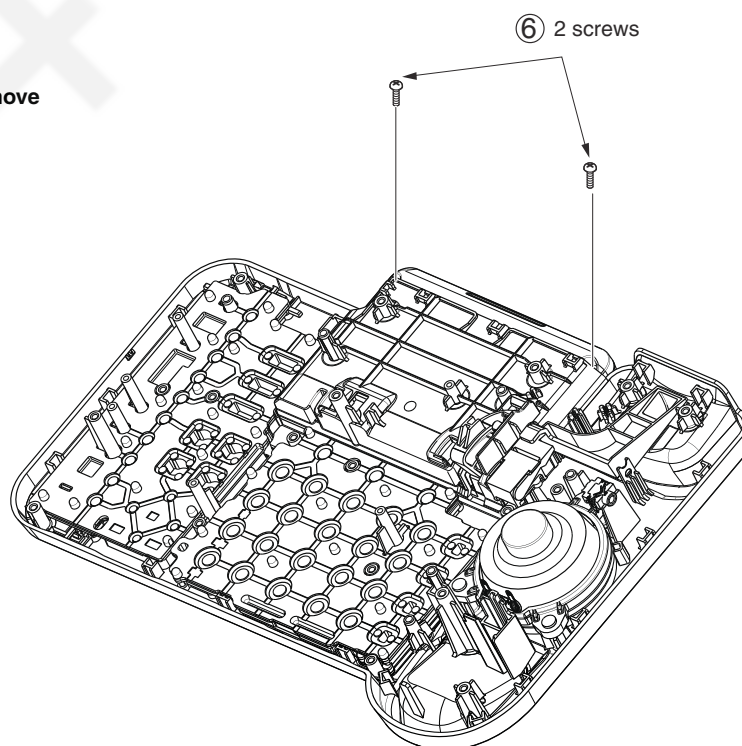


- ④ Remove screw and unsolder the parallel lead wire to remove the Jack P.C. Board.

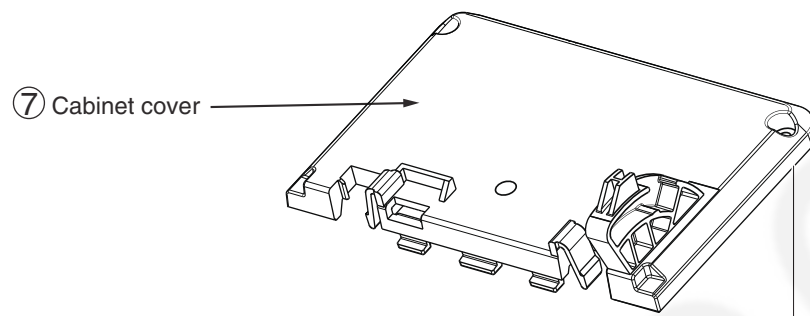
- ⑤ Remove the 8 screws to remove the operational P.C. board.



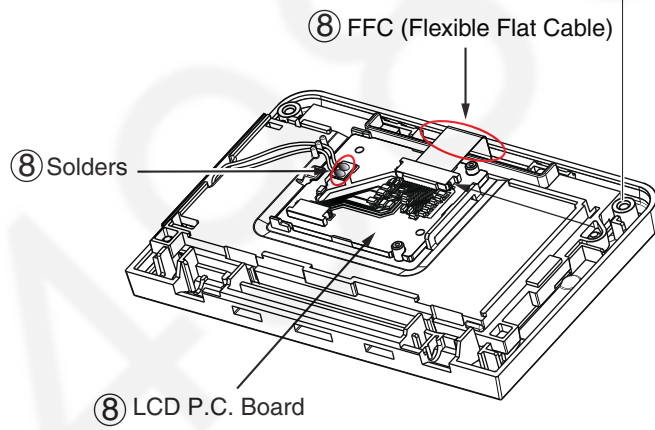
- ⑥ Remove the 2 screws to remove the LCD Unit.



⑦ Remove the cabinet cover.

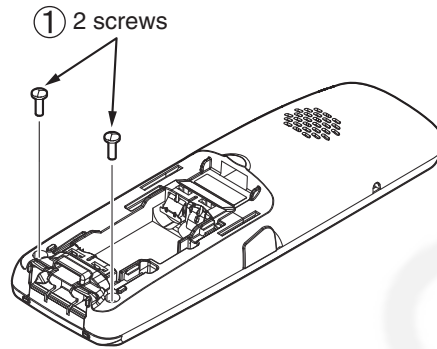


⑧ Remove the solder and FFC (Flexible Flat Cable) to remove the LCD P.C. Board.

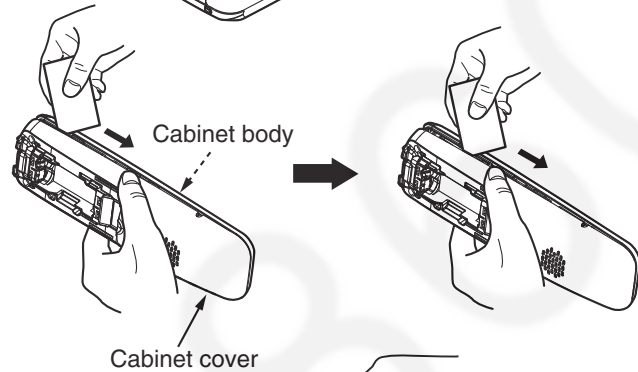


10.1.2. Handset

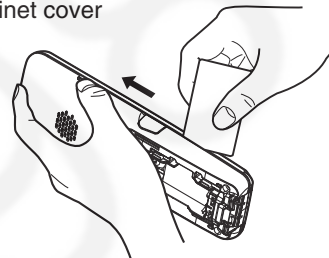
- ① Remove the 2 screws.



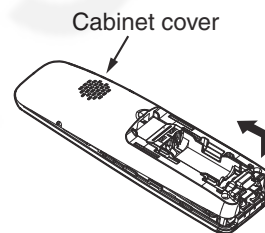
- ② Insert a plastic card.
(Ex. Used SIM card etc.)
between the cabinet body
and the cabinet cover, then
pull it along the gap to open
the cabinet.



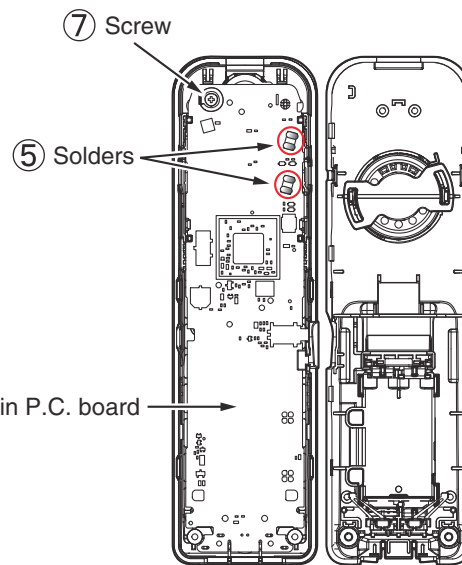
- ③ Likewise, open the other
side of the cabinet.



- ④ Remove the cabinet cover
by pushing it upward.



- ⑤ Remove the solders and tape.



- ⑥ Remove the 2 screws to remove
the 2 charge terminals.

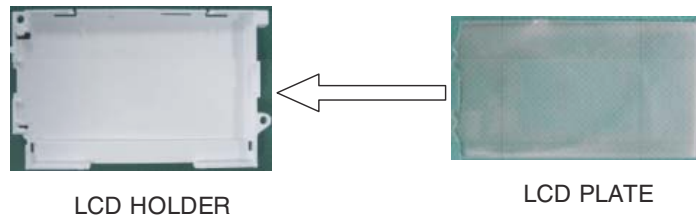
- ⑥ 2 charge terminals

- ⑦ Remove the screw to remove
the main P. C. board.

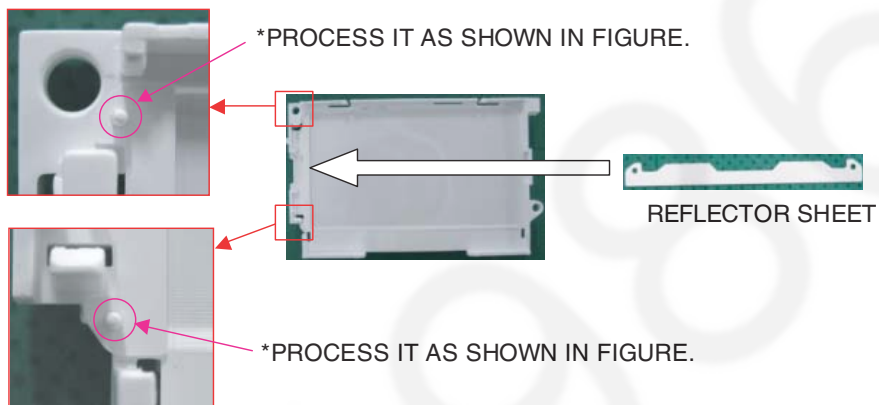
10.2. Assembly Instructions

10.2.1. How to Replace the Base unit LCD

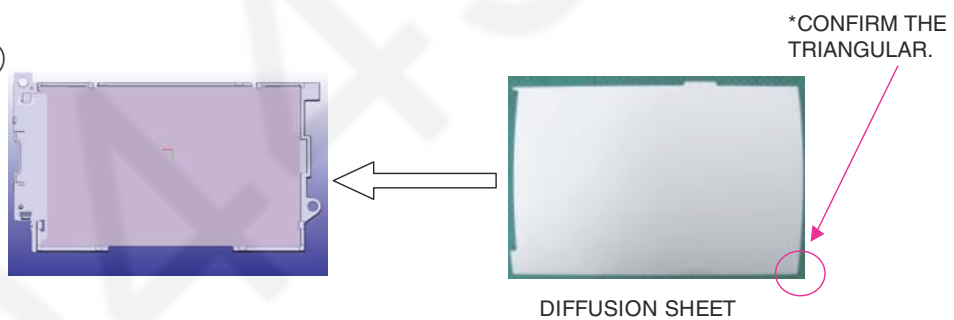
①



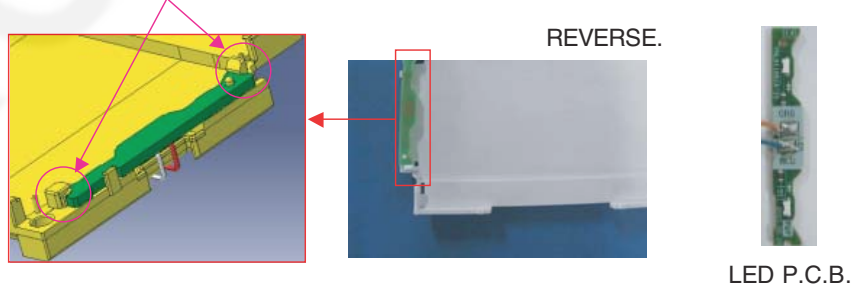
②



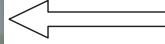
③



④ *PROCESS IT AS SHOWN IN FIGURE.



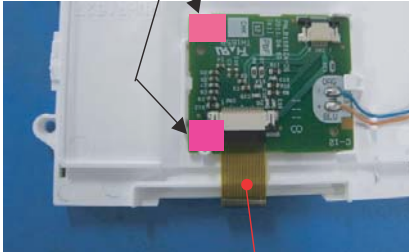
⑤



LCD

Attach LCD P.C.B. under conditions to push edge face.

⑥



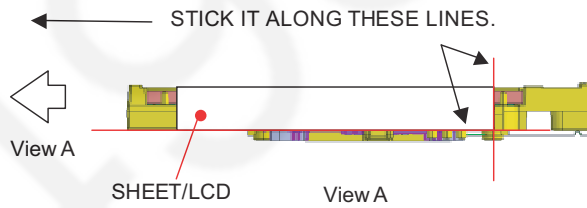
LCD P.C.B.

⑦



FFC/8

⑧



SHEET/LCD

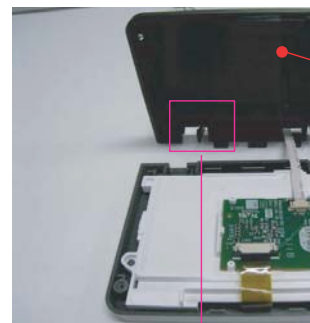
View A

⑨

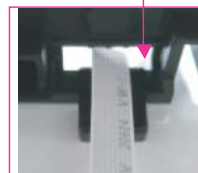


GRILL/LCD

⑩



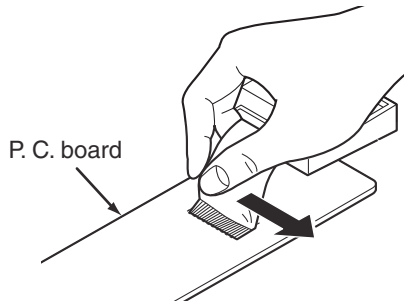
COVER/LCD



*INSERT FFC IN THE HOLE OF COVER/LCD.

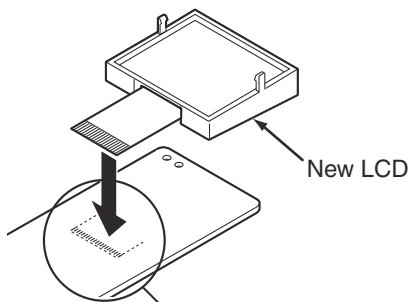
10.2.2. How to Replace the Handset LCD

①

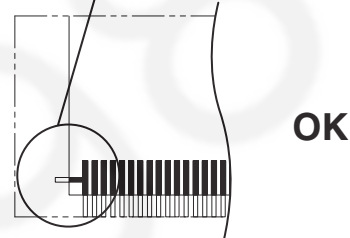
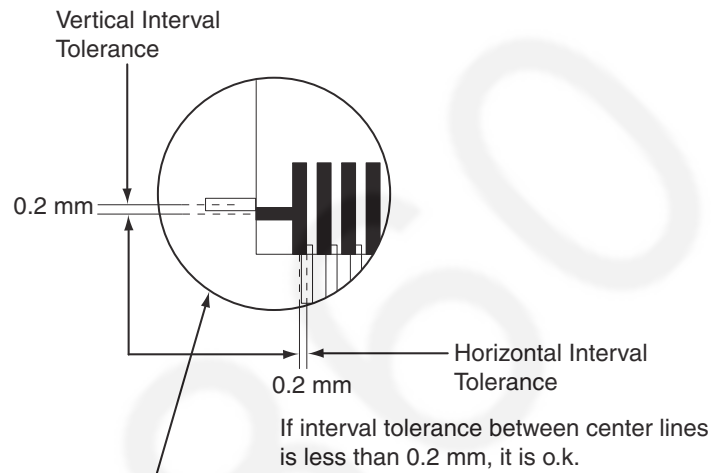


Peel off the FFC (Flexible Flat Cable) from the LCD, in the direction of the arrow. Take care to ensure that the foil on the P.C. board is not damaged.

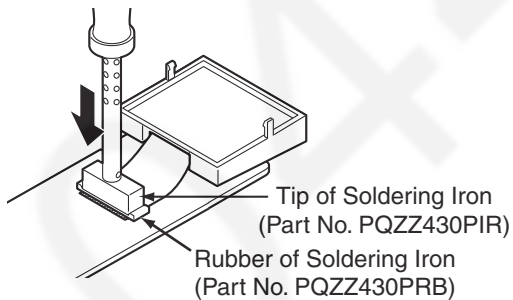
②



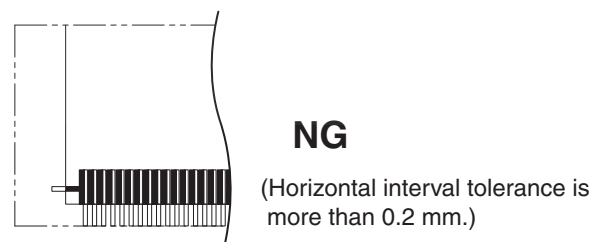
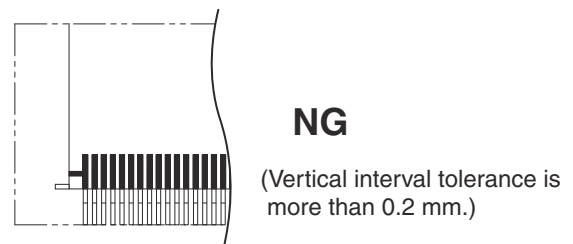
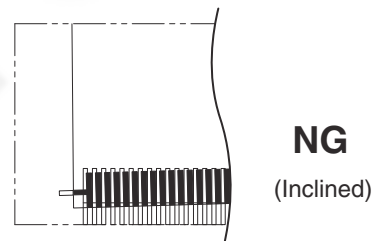
Fit the heatseal of a new LCD.



③



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



11 Measurements and Adjustments

This chapter explains the measuring equipment, the JIG connection, and the PC setting method necessary for the measurement in **Troubleshooting Guide (P.29)**

11.1. Equipment Required

- DECT tester: Rohde & Schwarz, CMD 60 is recommended.
- Frequency counter: It must be precise enough to measure intervals of 1 Hz (precision; ± 4 ppm).

Hewlett Packard, 53131A is recommended.

- Digital multi-meter (DMM): it must be able to measure voltage and current.
- Oscilloscope

11.2. The Setting Method of JIG

<Preparation>

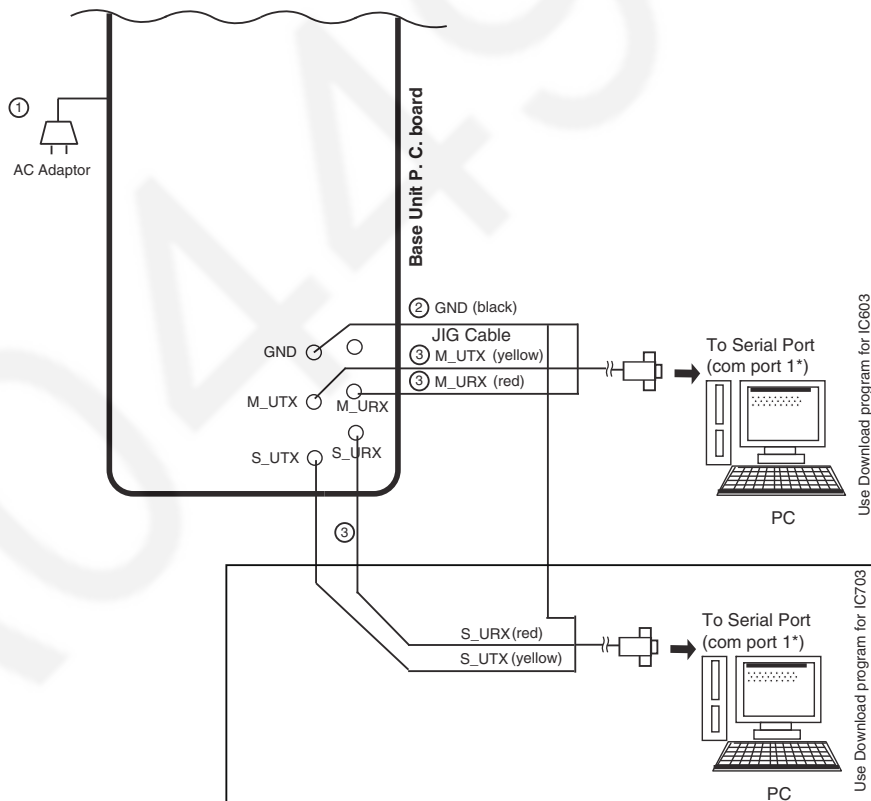
- Serial JIG cable: PQZZ1CD300E
- PC which runs in DOS mode
- **Batch file CD-ROM** for setting: PNZZTG9581B

11.2.1. Connections (Base Unit)

- ① Connect the AC adaptor to DC-JACK (base unit).
- ② Connect the JIG Cable GND (black) to GND.
- ③ Connect the JIG Cable RX (red) to URX and TX (yellow) to UTX.

Note:

*: COM port names may vary depending on what your PC calls it.



11.2.2. How to install Batch file into P.C.

1. Insert the Batch file CD-ROM into CD-ROM drive and copy PNZZTG**** folder to your PC (example: D drive).

2. Open an MS-DOS mode window.

<Example for Windows>

On your computer, click **[Start]**, select **Programs** (**All Programs** for Windows XP/Windows Server 2003), then click
MS-DOS Prompt. (for Windows 95/Windows 98)
 Or
Accessories-MS-DOS Prompt. (for Windows Me)
 Or
Command Prompt. (for Windows NT 4.0)
 Or
Accessories-Command Prompt. (for Windows 2000/Windows XP/Windows Server 2003)

3. At the DOS prompt, type "**D:**" (for example) to select the drive, then press the **Enter** key.

4. Type "**CD \PNZZTG******", then press the **Enter** key.

5. Type "**SET_COM=X**", then press the **Enter** key (X: COM port number used for the serial connection on your PC).

6. Type "**READID**", then press the **Enter** key.
 - If any error messages appear, change the port number or check the cable connection.
 - If any value appear, go to next step.

7. Type "**DOSKEY**", then press the **Enter** key.

<Example>

```
C:\Documents and Settings>D:
D:\>CD \PNZZTG****
D:\PNZZTG**** >SET_COM=X
D:\PNZZTG****>READID
00 52 4F A8 A8
D:\PNZZTG****>DOSKEY
D: \PNZZTG****> _
```

<Example: error happens>

```
C:\Documents and Settings>D:
D:\>CD \PNZZTG****
D:\PNZZTG**** >SET_COM=X
D: \PNZZTG****>READID
CreateFile error
ERROR 10: Can't open serial port
D:\PNZZTG ****> _
```

Note:

- "*****" varies depending on the country or models.

11.2.3. Commands

See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of EEPROM	Type "rdeeprom 00 00 FF", and the data from address "00 00" to "FF" is read out.
readid	Read ID (RFPI)	Type "readid", and the registered ID is read out.
writeid	Write ID (RFPI)	Type "writeid 00 18 E0 0E 98", and the ID "0018 E0 0E 98" is written.
setfreq	Adjust Frequency of RFIC	Type "setfreq nn".
hookoff1/hookoff2	Off-hook mode on Base Line1 & Line2	Type "hookoff1" for Line1.
hookon1/hookon2	On-hook mode on Base Line1 & Line2	Type "hookon1" for Line1.
getchk	Read checksum	Type "getchk".
wreeprom	Write the data of EEPROM	Type "wreeprom 01 23 45". "01 23" is address and "45" is data to be written.
bursttx	Burst TX mode	Type "bursttx"
textrx	Test RX mode	Type "textrx"
tph	High TX mode	Type "tph"
tpl	Low TX mode	Type "tpl"

11.3.1. Bottom View



11.4. The Setting Method of JIG (Handset)

<Preparation>

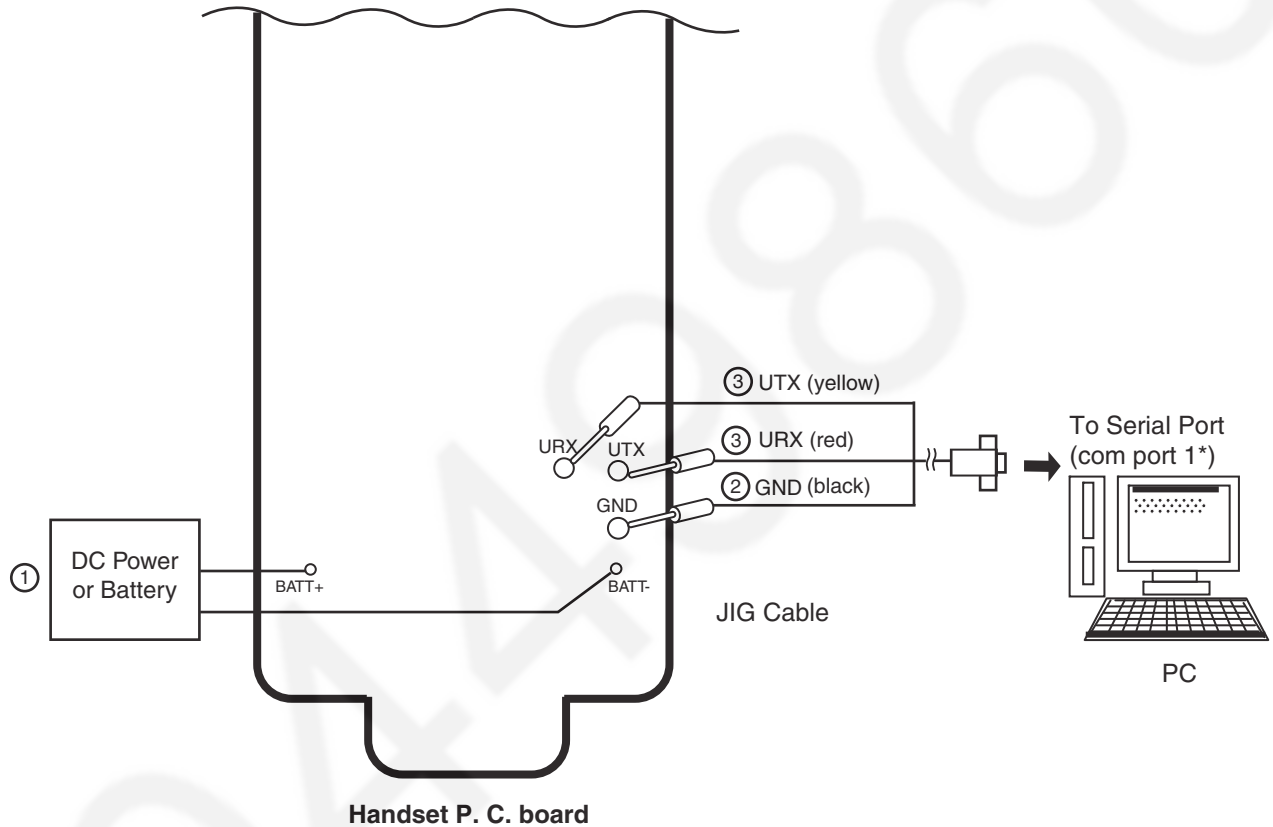
- Serial JIG cable: PQZZ1CD300E
- PC which runs in DOS mode
- **Batch file CD-ROM** for setting: PNZZTG9581B

11.4.1. Connections

- ① Connect the DC Power or Battery to BATT+ and BATT-.
- ② Connect the JIG cable GND (black) to GND.
- ③ Connect the JIG cable UTX (yellow) to UTX and URX (red) to URX.

Note:

*: Comport names may vary depending on what your PC calls it.



11.4.2. How to install Batch file into P.C.

1. Insert the Batch file CD-ROM into CD-ROM drive and copy PNZZTG***** folder to your PC (example: D drive).

2. Open an MS-DOS mode window.

<Example for Windows>

On your computer, click **[Start]**, select **Programs** (**All Programs** for Windows XP/Windows Server 2003), then click
MS-DOS Prompt. (for Windows 95/Windows 98)
 Or
Accessories-MS-DOS Prompt. (for Windows Me)
 Or
Command Prompt. (for Windows NT 4.0)
 Or
Accessories-Command Prompt. (for Windows 2000/Windows XP/Windows Server 2003)

3. At the DOS prompt, type "**D:**" (for example) to select the drive, then press the **Enter** key.

4. Type "**CD \PNZZTG*******", then press the **Enter** key.

<Example>

```
C: \Documents and Settings>D:
D: \>CD \PNZZTG*****
D: \PNZZTG***** >SET RTX_COM=X
D: \PNZZTG*****>READID
00 52 4F A8 A8
D: \PNZZTG*****>DOSKEY
D: \PNZZTG*****> _
```

5. Type "**SET RTX_COM=X**", then press the **Enter** key
 (X: COM port number used for the serial connection on your PC).

6. Type "**READID**", then press the **Enter** key.

- If any error messages appear, change the port number or check the cable connection.
- If any value appear, go to next step.

7. Type "**DOSKEY**", then press the **Enter** key.

<Example: error happens>

```
C: \Documents and Settings>D:
D: \>CD \PNZZTG*****
D: \PNZZTG***** >SET RTX_COM=X
D: \PNZZTG*****>READID
CreateFile error
ERROR 10: Can't open serial port
D: \PNZZTG*****> _
```

Note:

- "*****" varies depending on the country or models.

11.4.3. Commands

See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of FLASH	Type "rdeeprom 00 00 FF", and the data from address "00 00" to "FF" is read out.
readid	Read ID (RFPI)	Type "readid", and the registered ID is read out.
writeid	Write ID (RFPI)	Type "writeid 00 18 E0 0E 98", and the ID "0018 E0 0E 98" is written.
setfreq	Adjust Frequency of RFIC	Type "setfreq nn".
getchk	Read checksum	Type "getchk".
wreeprom	Write the data of FLASH	Type "wreeprom 01 23 45". "01 23" is address and "45" is data to be written.
bursttx	Burst TX mode	Type "bursttx"
textrx	Test RX mode	Type "textrx"
tph	High TX mode	Type "tph"
tpl	Low TX mode	Type "tpl"

11.6. Things to Do after Replacing IC or X'tal

If repairing or replacing EEPROM and X'tal, it is necessary to download the required data such as Programming data or adjustment data, etc. in memory. The set doesn't operate if it is not executed.

11.6.1. How to download the data

11.6.1.1. Base Unit

First, operate the PC setting according to **The Setting Method of JIG** (P.56).

Then download the appropriate data according to the following procedures.

Items		How to download/Required adjustment
BBIC(IC601)	Programming data is stored in memory.	1) Clock adjustment: Refer to Check Point (H). Refer to (P.43) 2) 2.25V setting and battery low detection adjustment 1: Apply DC Power 2.25V to BATT-GND 2: Execute the command "ad1.bat" 3: Check returned value is assumed to be "AB CD" 4: Execute the command "LVW CD AB". 5: Calculate $0 \times ABCD + 0 \times 14 = EFGH$ and execute the command "RVW GH EF". 6: Calculate $0 \times ABCD - 0 \times 14 = IJKL$ and execute the command "DVW KL IJ".
EEPROM (IC604)	Adjusted parameter data is stored in memory. (country version batch file, default batch file, etc.)	1) Change the address "0001" of EEPROM to "AA" to download the data. 2) Default batch file: Execute the command "default.bat". 3) Country version batch file: Execute the command "TG9581US_US_RevXXX.bat". (*1) 4) Clock adjustment, 2.25V setting and battery low detection adjustment (*2)
FLASH1 (IC602)	Voice prompt data is stored in memory. (vary depending on country version)	1) Wait more than 15 seconds after connecting the JIG Cable. 2) Execute the command "VPDL2011 -AA ZZZ.bin" (*1). (writing time: approx. 1 min (115200 bps).)
FLASH2 (IC603)	Program D/L	1) Make sure to connect the JIG cable and disconnect the DC Power in order to download the data. 2) Execute the command "flw441 *****.hex". 3) Connect the DC Power. 4) Press the PC Enter key once. 5) After a few minutes, "Successful upgrade" is displayed on the PC indicating downloading has finished. 6) Detach the JIG cable, then disconnect the DC Power. 7) Connect the DC Power. 8) Connect the JIG cable again, and execute the command "getchk", then confirm the checksum value is correct. If the downloading fails, start again from step 1.
FLASH2 (IC703)	Program D/L	1) Make sure to connect the JIG cable and disconnect the DC Power in order to download the data. 2) Execute the command "flw441 *****.hex". 3) Connect the DC Power. 4) Press the PC Enter key once. 5) After a few minutes, "Successful upgrade" is displayed on the PC indicating downloading has finished. 6) Detach the JIG cable, then disconnect the DC Power. 7) Connect the DC Power. 8) Connect the JIG cable again, and execute the command "getchk", then confirm the checksum value is correct. If the downloading fails, start again from step 1.
X'tal (X1)	System clock	Clock adjustment data is in EEPROM, adjust the data again after replacing it. 1) Apply 5.5V between DCP and DCM with DC power. 2) Input Command "sendchar sfr", then you can confirm the current value. 3) Check X'tal Frequency. ($10.368\text{MHz} \pm 41\text{Hz}$). 4) If the frequency is not $10.368\text{MHz} \pm 41\text{Hz}$, adjust the frequency of CLK executing the command "sendchar sfr xx xx (where xx is the value)" so that the reading of the frequency counter is $10.368\text{MHz} \pm 5\text{Hz}$.
USB IC (IC401)	USB to UART bridge controller	Refer to How to be written to USB_IC (P.65).

Note:

(*1) XXX_YYY: revision number, ZZZ: Voice prompt, AA: Baud rate (9600/19200/57600/115200)

"XXX_YYY" and "ZZZ" vary depending on the country version. You can find them in the batch file, PNZZ- mentioned in **The Setting Method of JIG** (P.56).

When adjust the frequency the BT Unit.

	Item	Test command		Description
		Input	Echo back	
1	Power on	-	-	Wait 10seconds and connect JIG
2	Test mode	sendchar XBT 1 ␣ sendchar #X ts ␣	OK #XXTEST	Enter"XBT 1" and then "OK" is back when it succeeds to enter test mode.
3	Confirm a default value	sendchar #X nc ␣	#XXnc=0x1A	Confirm a default value before adjusting the frequency.
4	Adjust the frequency	sendchar #X b3 39 19 ␣ sendchar nc,, ␣	#XXTS ch=2441 pwr=19 #XXnc=0x,,	Adjust the frequency to "2441MHz ± 10kHz" by changing the value of, Test Point: ANT_BT, refer to Bottom View (P.58)

Note:

␣: Enter key

11.6.1.1.1. How to written to USB_IC

System requirements (PC)

Item	Specifications
CPU	1.0 GHz Intel ³ Pentium ³ /Celeron ³ processor or comparable CPU or higher processor
RAM	512 MB or more
OS	● Microsoft Windows³ XP Service Pack 3 or later (32-bit only) ● Microsoft Windows Vista³ Service Pack 2 or later ● Microsoft Windows 7 Service Pack 1 or later
Microsoft Office Outlook	● Microsoft Office Outlook 2003 Service Pack 3 or later ● Microsoft Office Outlook 2007 Service Pack 2 or later ● Microsoft Office Outlook 2010 or later (Service Pack)
Hard disk	20 MB or more
Video resolution	1,024 x 768 or higher
Others	● CD-ROM drive ● USB 2.0

CD ROM

PNJX1009Z
PNZZTG9581B
(They are available at web site)

11.6.1.1.2.

11.6.1.1.3. Downloading software (preparation)

(1) CP210x_VCP_Win_XP_S2K3_Vista_7.exe

You can download the software from Web site as below.

<https://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx>

Click Download for Windows XP/Server 2003/Vista/7 (v6.3a)

VCP DRIVER Kit

Activate "CP210x_VCP_Win_XP_S2K3_Vista_7.exe" from CDROM (PNZZTG9581B) in the "Driver" folder, and follow the wizard

(2) CP210xSetIDs.exe

<https://www.silabs.com/PRODUCTS/INTERFACE/USBTOUART/Pages/usb-to-uart-bridge.aspx>

Click tools

Copy "an144sw.zip" to an appropriate folder

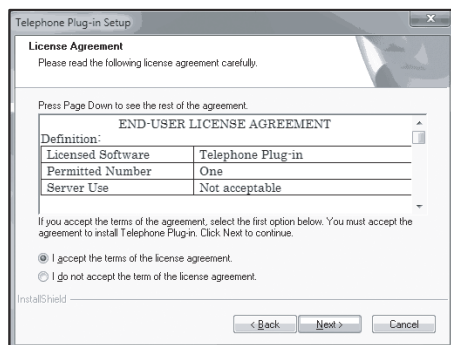
(3) Installing the "Telephone Plug-in"

11.6.1.1.4. Installing the “Telephone Plug-in”

Before installing “Telephone Plug-in”, make sure of the following:

- Microsoft Office Outlook is installed on your computer.
- The base unit is not connected to your computer with the mini USB cable (until instructed to do so).

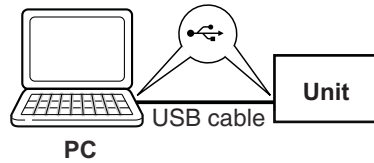
- 1 Start Windows and exit all other applications.
 - You must be logged in as an administrator in order to install “Telephone Plug-in”.
- 2 Insert the included CD-ROM into your CD-ROM drive.
 - Installation starts automatically. If the installation does not start, double click **[Setup.exe]** in your CD-ROM drive folder to start installing.
 - **For Microsoft Windows Vista and Microsoft Windows 7 users:**
Click **[Run Setup.exe]** when prompted.
- 3 When the language selection window is displayed, select the desired language and click **[Next]**.
- 4 When the “Telephone Plug-in” window is displayed, click **[Next]**.
- 5 Read the license agreement carefully. If you accept the terms of the license agreement, check the box and click **[Next]**.



- 6 When the “Telephone Plug-in” install shield wizard is displayed, click **[Install]**.
- 7 When installation is finished, click **[Finish]** to complete the installation. Then remove the CD-ROM from your CD-ROM drive.

11.6.1.1.5. How to be written to USB_IC

(1) Connect KX-TG9581 to PC with a USB cable.



(2) Activate "AN144SW¥CP210X¥CP210XSETIDs.exe"

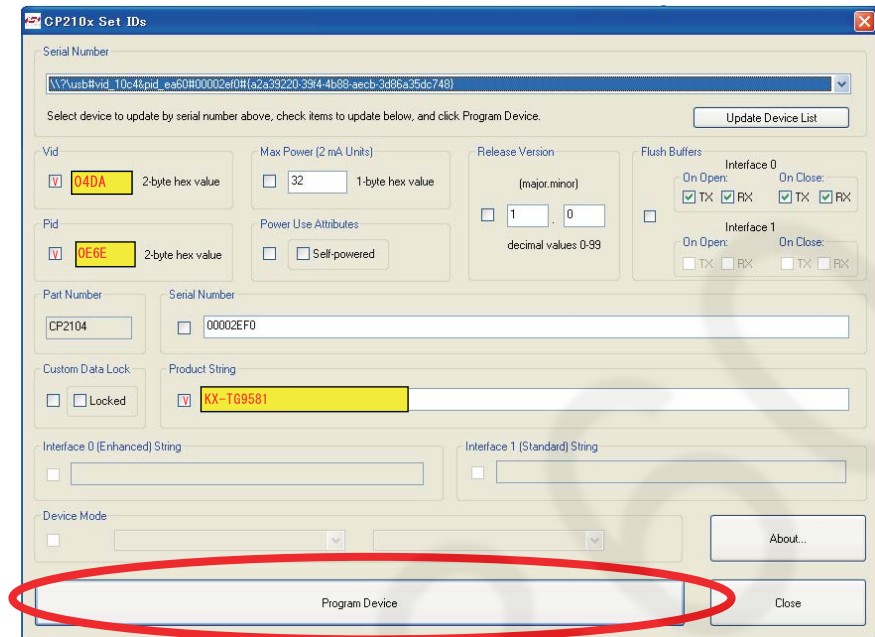
The screenshot shows the 'CP210x Set IDs' dialog box. Several fields are highlighted with red circles: the 'Vid' field (containing '10C4'), the 'Pid' field (containing 'EA60'), the 'Product String' dropdown (showing 'CP2104 USB to UART Bridge Controller'), and the 'Custom Data Lock' checkbox (which is checked).

(3) Input parameters

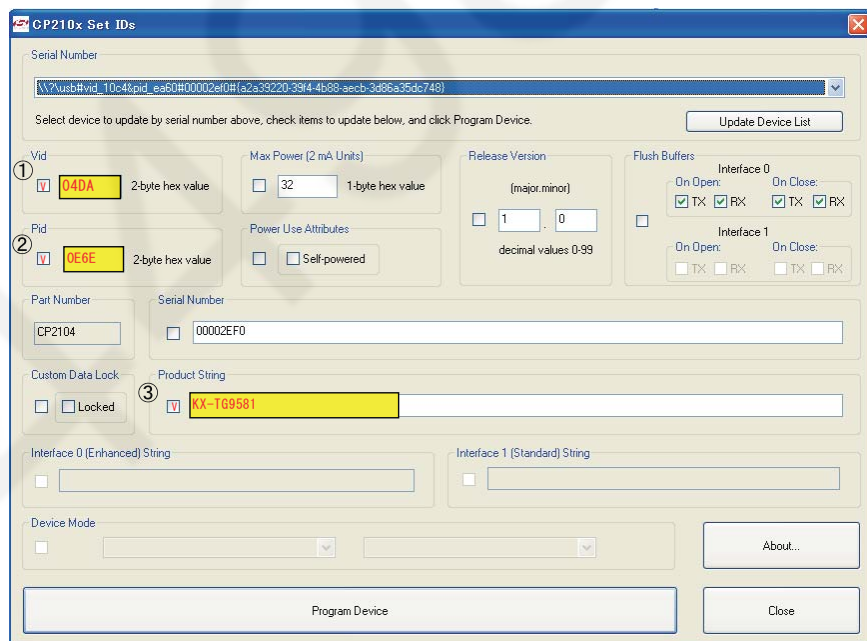
- ① Check ☒ and input Vid "04DA"
- ② Check ☒ and input Pid "0E6E"
- ③ Check ☒ and input Product String "KX-TG9581"

This screenshot shows the 'CP210x Set IDs' dialog box with the input parameters highlighted by yellow boxes and numbered circles: ① Vid '04DA', ② Pid '0E6E', and ③ Product String 'KX-TG9581'. The 'Custom Data Lock' checkbox is also checked.

(4) Click "Program Device"



(5) Disconnect USB CABLE, and then reconnect again.



11.6.1.2. Handset

First, operate the PC setting according to **The Setting Method of JIG** (P.59).

Then download the appropriate data according to the following procedures.

Items		How to download/Required adjustment
EEPROM (IC3)	Adjusted parameter data is stored in memory. (country version batch file, default batch file, etc.)	1) Default batch file: Execute the command "default.bat". 2) Default batch file (remaining): Execute the command "TGA950US_DEF_RevXXX.bat". (*2) 3) Country version batch file: Execute the command "TGA950US_US_RevXXX.bat". (*2) 4) Clock adjustment 5) 2.35 V setting and battery low detection
X'tal (X1)	System clock	1) Apply 2.6V between BATT+ and BATT- with DC power. 2) Input Command " sendchar sfr", then you can confirm the current value. 3) Check X'tal Frequency.(10.368 MHz $\pm$ 100 Hz). 4) If the frequency is not 10.368 MHz $\pm$ 100 Hz, adjust the frequency of CLK executing the command "sendchar sfr xx xx (where xx is the value)" so that the reading of the frequency counter is 10.368000 MHz $\pm$ 5 Hz.
Flash (IC4)	Program DL	1) Make sure to connect the JIG cable and disconnect the DC Power in order to download the data. 2)Excute the command "*****.hex". 3)Connect the DC Power. 4)Press the PC Enter key once. 5)After a few minutes, "Successful upgrade" is displayed on the PC indicating downloading has finished. 6)Detach the JIG cable, then disconnect the DC Power. 7)Connect the DC Power. 8)Connect the JIG cable again, and excute the command "getchk", then confirm the checksum value is correct. If the download fails, start again from step1.

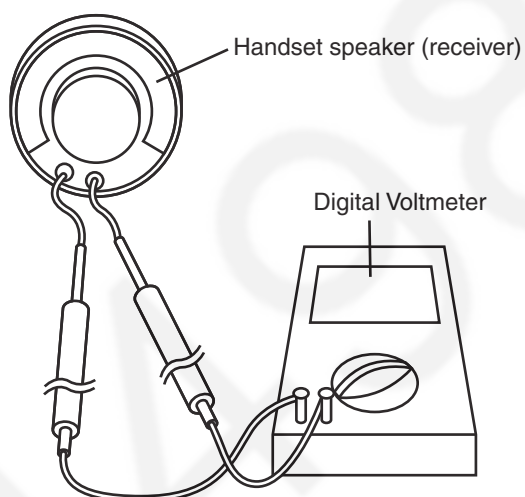
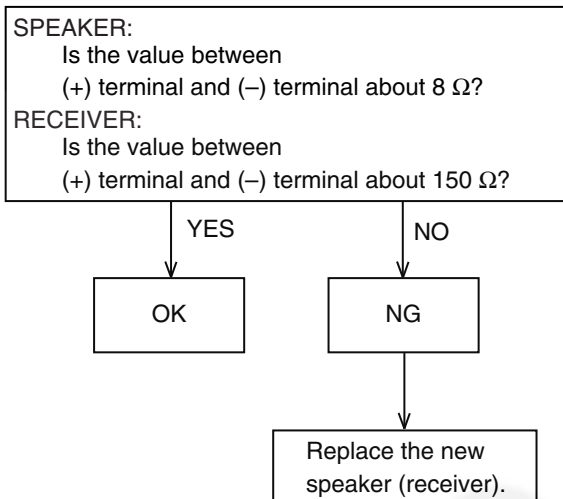
Note:

(*2) XXX_YYY: revision number

"XXX_YYY" vary depending on the country version. You can find them in the batch file, PNZZ- mentioned in **The Setting Method of JIG** (P.59).

11.7. How to Check the Portable Speaker or Receiver

1. Prepare the digital voltmeter, and set the selector knob to ohm meter.
2. Put the probes at the speaker terminals as shown below.



11.8. Frequency Table (MHz)

	Ch. (hex)	TX/RX Frequency (MHz)
Channel 0	00	1928.448
Channel 1	01	1926.720
Channel 2	02	1924.992
Channel 3	03	1923.264
Channel 4	04	1921.536

11.9. Bluetooth Frequency Table

Ch.	Frequency (MHz)	Ch.	Frequency (MHz)	Ch.	Frequency (MHz)
0	2402	33	2435	66	2468
1	2403	34	2436	67	2469
2	2404	35	2437	68	2470
3	2405	36	2438	69	2471
4	2406	37	2439	70	2472
5	2407	38	2440	71	2473
6	2408	39	2441	72	2474
7	2409	40	2442	73	2475
8	2410	41	2443	74	2476
9	2411	42	2444	75	2477
10	2412	43	2445	76	2478
11	2413	44	2446	77	2479
12	2414	45	2447	78	2480
13	2415	46	2448		
14	2416	47	2449		
15	2417	48	2450		
16	2418	49	2451		
17	2419	50	2452		
18	2420	51	2453		
19	2421	52	2454		
20	2422	53	2455		
21	2423	54	2456		
22	2424	55	2457		
23	2425	56	2458		
24	2426	57	2459		
25	2427	58	2460		
26	2428	59	2461		
27	2429	60	2462		
28	2430	61	2463		
29	2431	62	2464		
30	2432	63	2465		
31	2433	64	2466		
32	2434	65	2467		

12 Miscellaneous

12.1. 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.

12.1.1. 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)

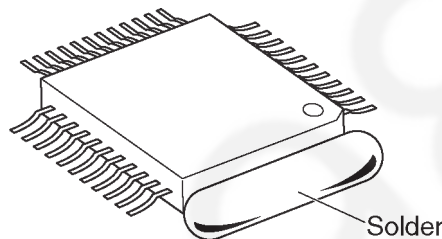
Note: See **About Lead Free Solder (Pbf: Pb free) (P.5)**.

12.1.2. How to Remove the IC

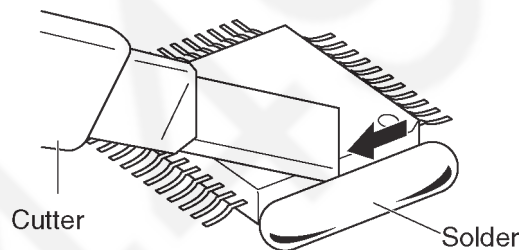
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

Note:

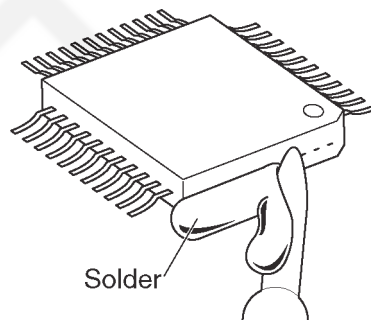
If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



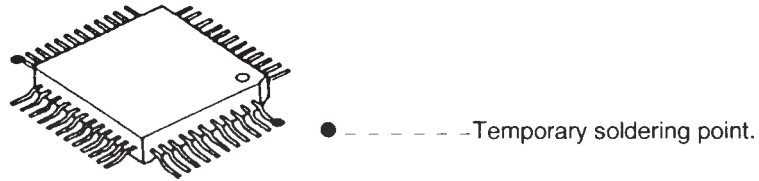
3. While the solder melts, remove it together with the IC pins.



When you attach a new IC to the board, remove all solder left on the board 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.

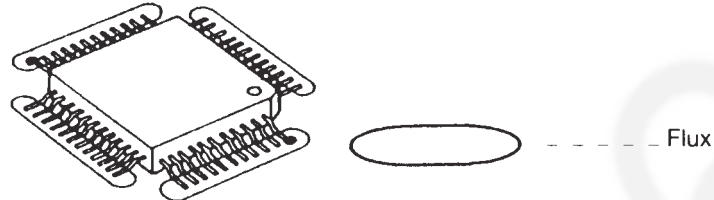
12.1.3. How to Install the IC

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

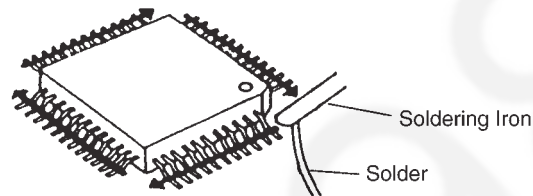


*Check the accuracy of the IC setting with the corresponding soldering foil.

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

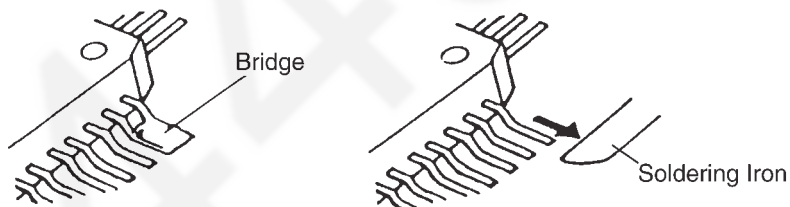


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



12.1.4. 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.



12.2. How to Replace the LLP (Leadless Leadframe Package) IC

12.2.1. 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

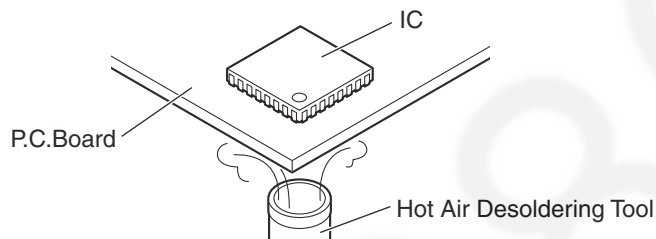
Temperature: 608 °F ± 68 °F (320 °C ± 20 °C)

12.2.2. 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.

12.2.3. How to Remove the IC

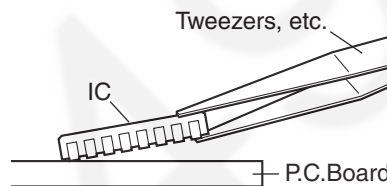
1. Heat the IC with a hot air desoldering tool through the P.C.Board.



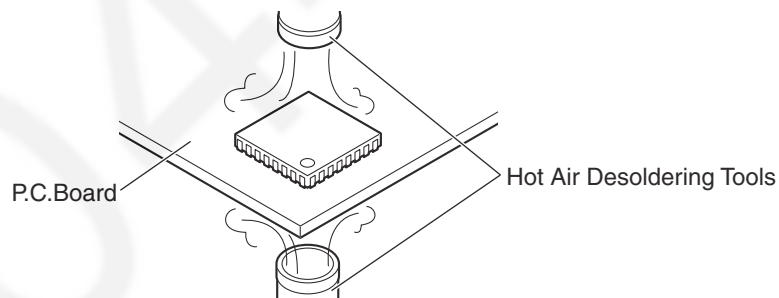
2. Pick up the IC with tweezers, etc. when the solder is melted completely.

Note:

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



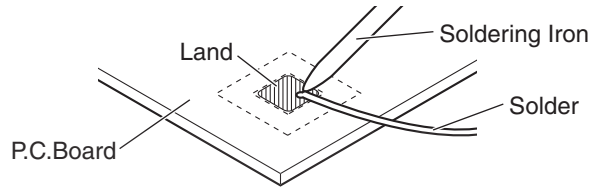
When it is hard to melt the solder completely, heat it with a hot air desoldering tool through the IC besides through the P.C.Board.



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

12.2.4. How to Install the IC

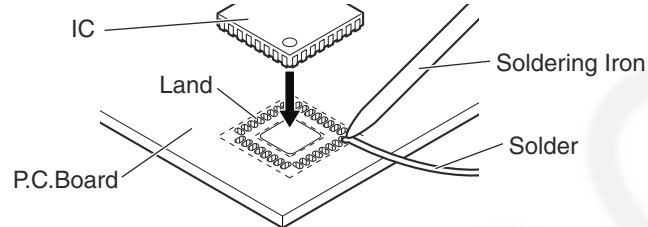
1. Place the solder a little on the land where the radiation GND pad on IC bottom is to be attached.



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

Note:

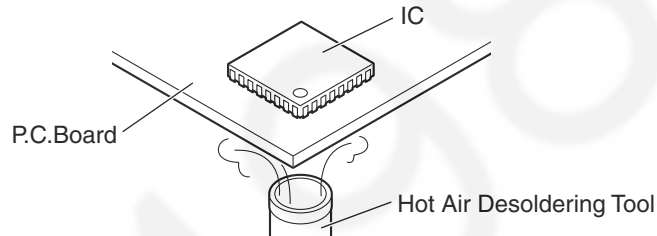
- When placing the IC, the positioning should be done very carefully.



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

Note:

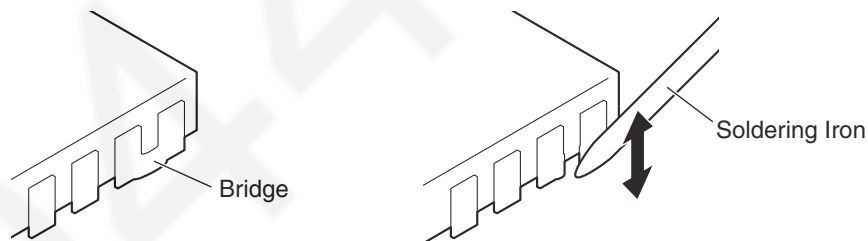
- Be sure to place it precisely, controlling the air volume of the hot air desoldering tool.



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

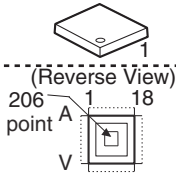
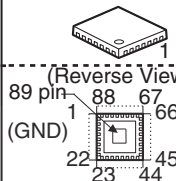
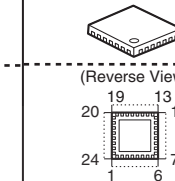
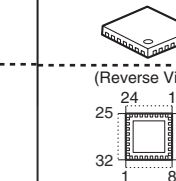
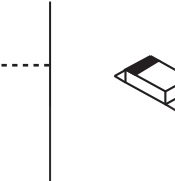
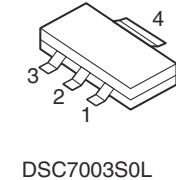
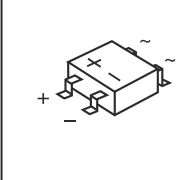
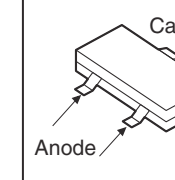
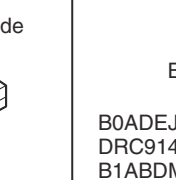
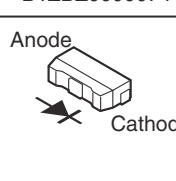
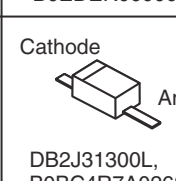
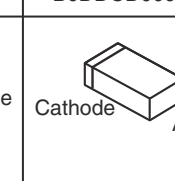
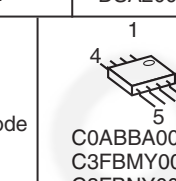
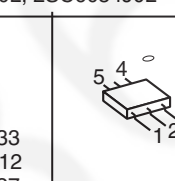
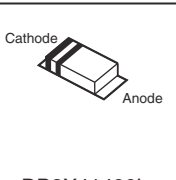
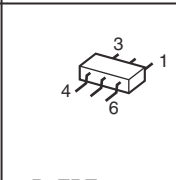
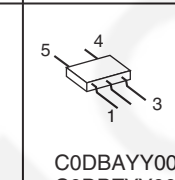
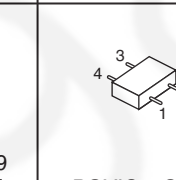
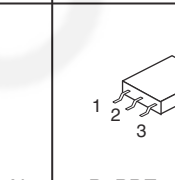
12.2.5. How to Remove a Solder Bridge

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

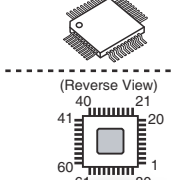
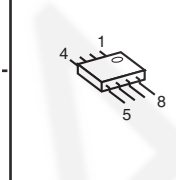
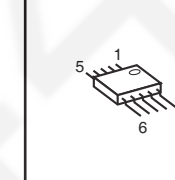
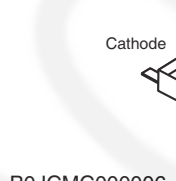


12.3. Terminal Guide of the ICs, Transistors and Diodes

12.3.1. Base Unit

 (Reverse View) 206 point A V C1CB00003611	 (Reverse View) 89 pin (GND) C1CB00003837	 (Reverse View) C1CB00003661	 (Reverse View) PNWP4TG9581H	 PQVDPTZT2530
 DSC7003S0L B1ADGP000008 B1ZBZ0000074	 B0EDER000009	 Cathode Anode B0DDCD000001	 B, C, E B0ADEJ000026, DSA5001S0L, DRC9143Z0L, B1ABDF000017, B1ABDM000001, B1ADGE000012, B1ABGE000011, DRC9123J0L, DSA2001R0L, 2SC6054J0L	
 Anode Cathode B3AFB0000211	 Cathode Anode DB2J31300L, B0BC4R7A0268 B0JCDD000001,	 Cathode Anode B0BC4R3A0006	 1, 4, 5, 8 C0ABBA000233 C3FBMY000312 C3FBNY000327 PNWI1TG9581H	 1, 2, 3, 4, 5 FM6K62010L
 Cathode Anode DB2X41400L	 1, 2, 3, 4, 5, 6 B0ZBZ0000146	 1, 2, 3, 4, 5, 6 C0DBAYY00289 C0DBZYY00741	 1, 2, 3, 4 PQVIC61CC20N	 1, 2, 3, 4, 5 B3PBE0000073

12.3.2. Handset

 (Reverse View) 40, 21, 20, 1, 80, 61, 60, 41 C1CB00002906	 1, 2, 3, 4, 5, 6, 7, 8 PNWITG939TR	 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 C1CB00001842	 B, C, E B1ADGE000004, UN9219J, 2SC6054JSL B1ABDF000026, B0DDCL000001
 Cathode Anode B0JCMC000006, 1SS355, B0JCME000035 MA8043M, MA27P1200L	 (Reverse View) Cathode Anode B3ACB0000216		

13 Schematic Diagram

13.1. For Schematic Diagram

13.1.1. 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. The schematic diagrams may be modified at any time with the development of new technology.

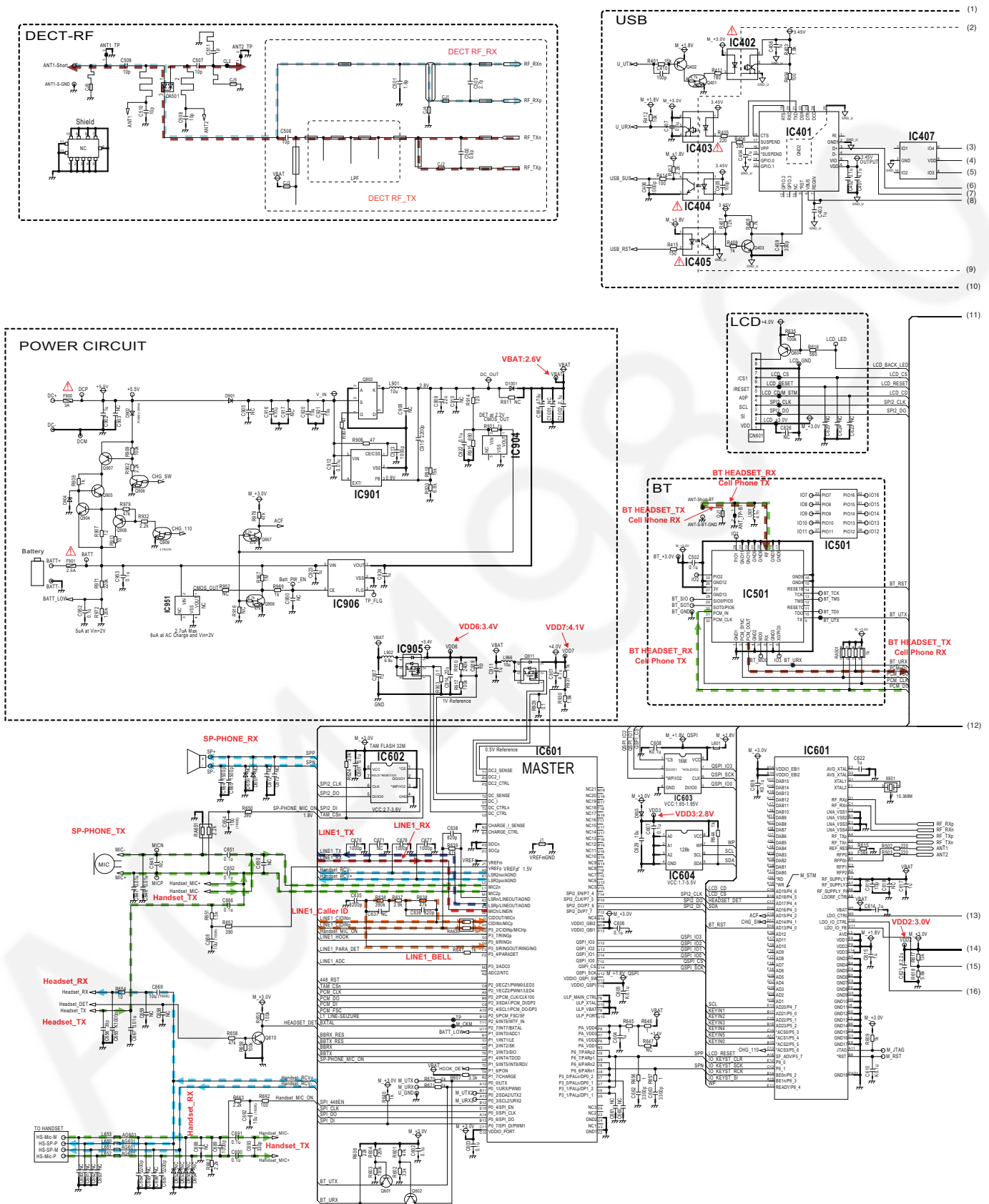
13.1.2. Handset (Schematic Diagram (Handset))

Notes:

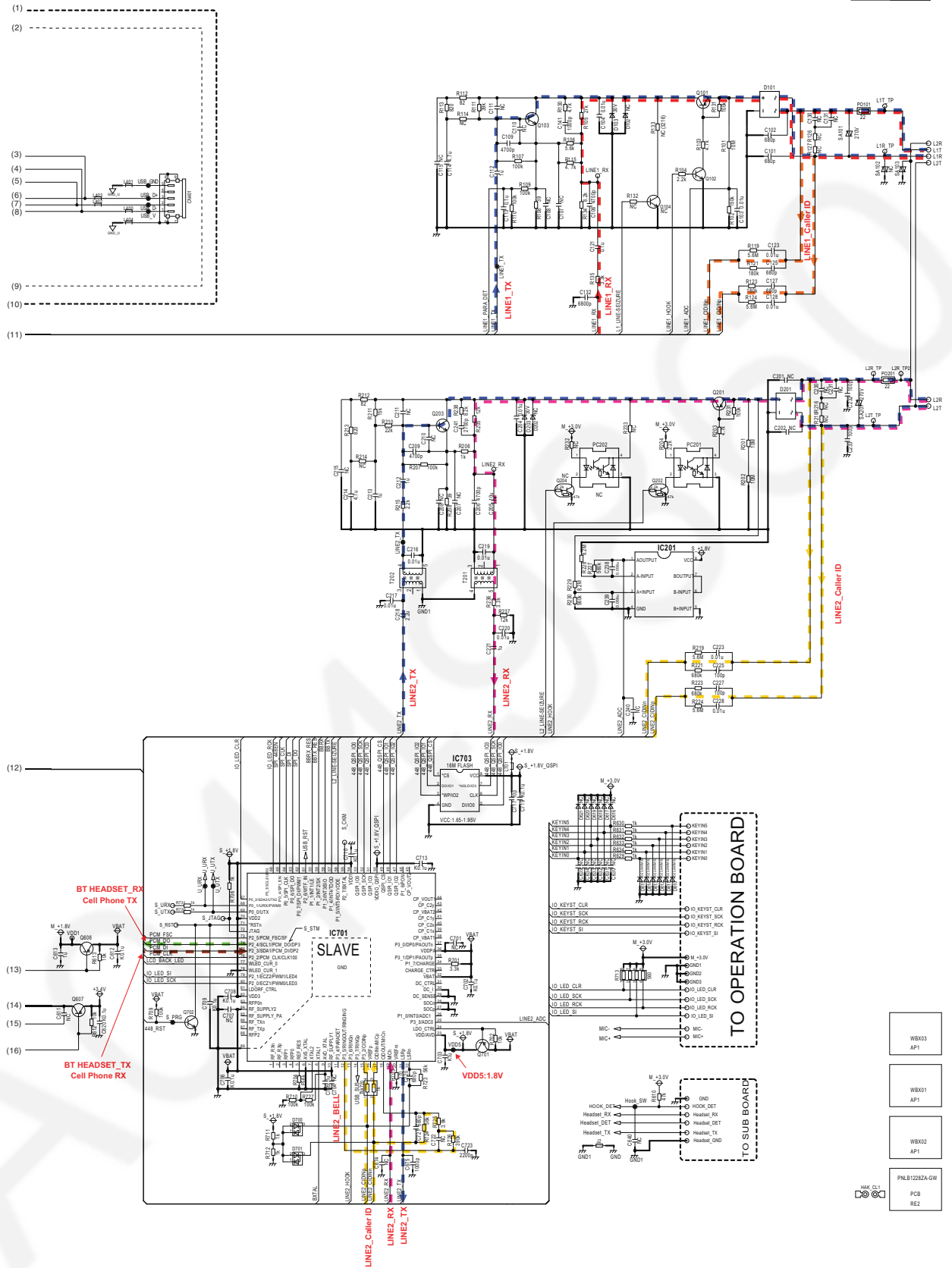
1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams may be modified at any time with the development of new technology.

13.2. Schematic Diagram (Base Unit_Main)

1/2



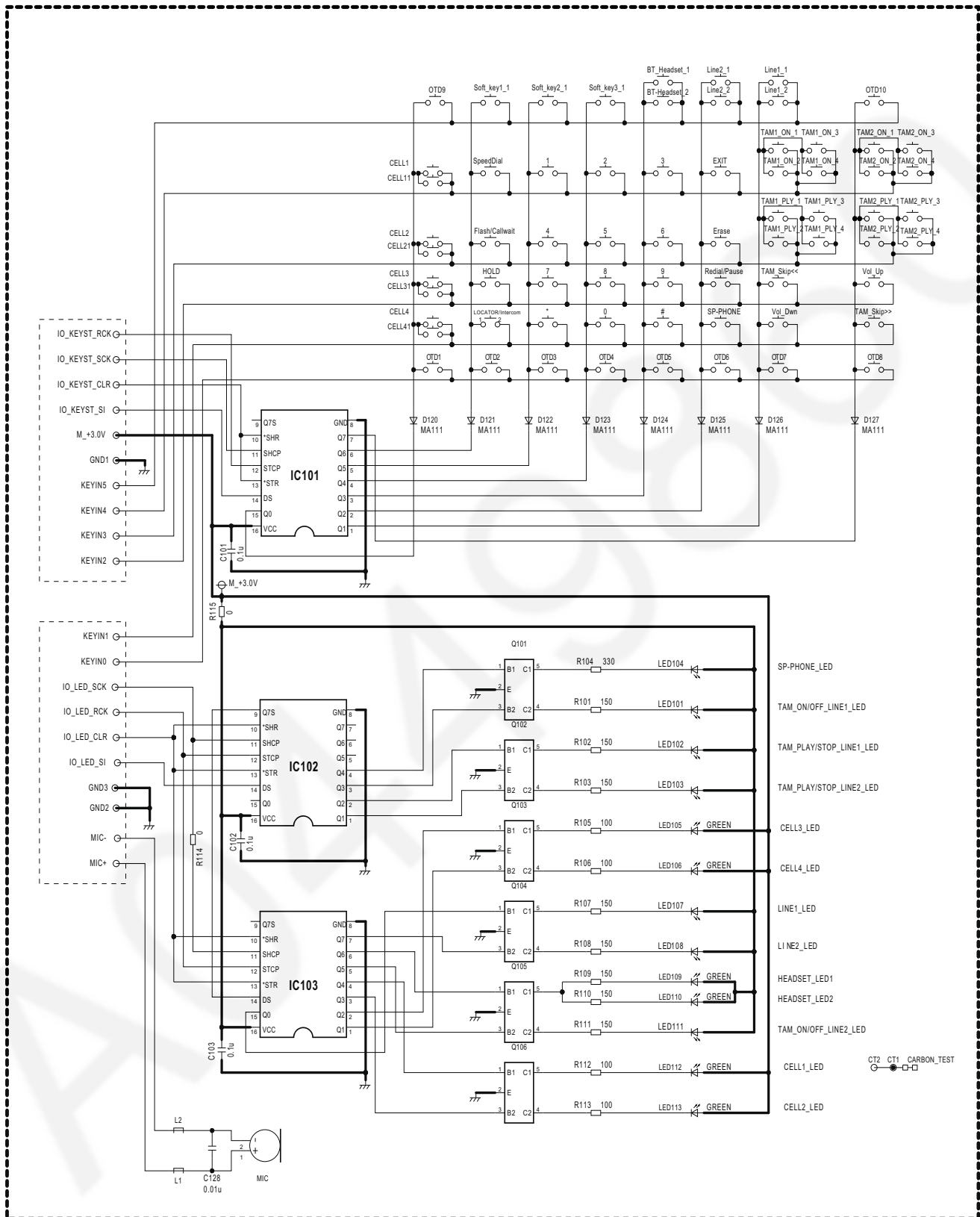
NC: No Components



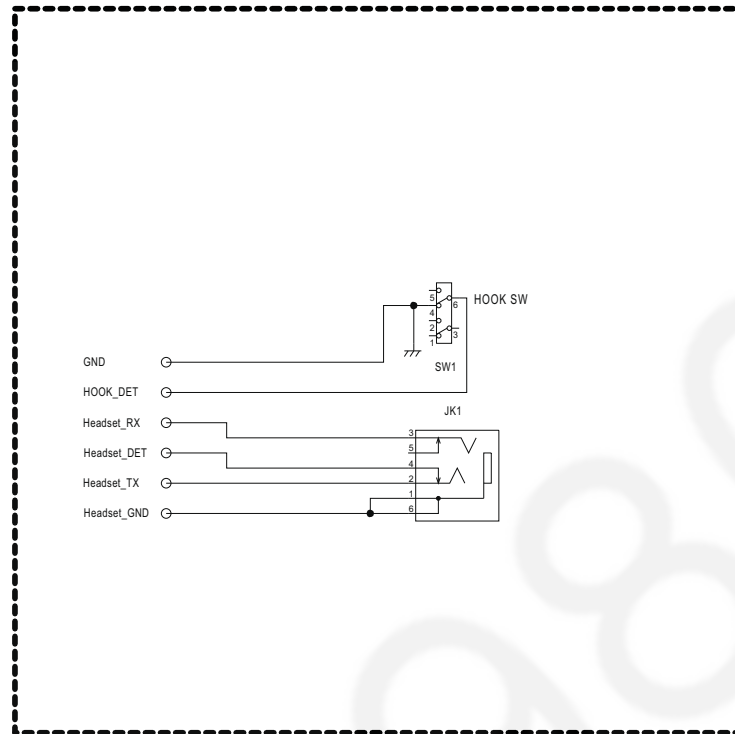
NC: No Components
KX-TG9581 SCHEMATIC DIAGRAM (Base Unit_Main)

13.3. Schematic Diagram (Base Unit_Operation)

1/2



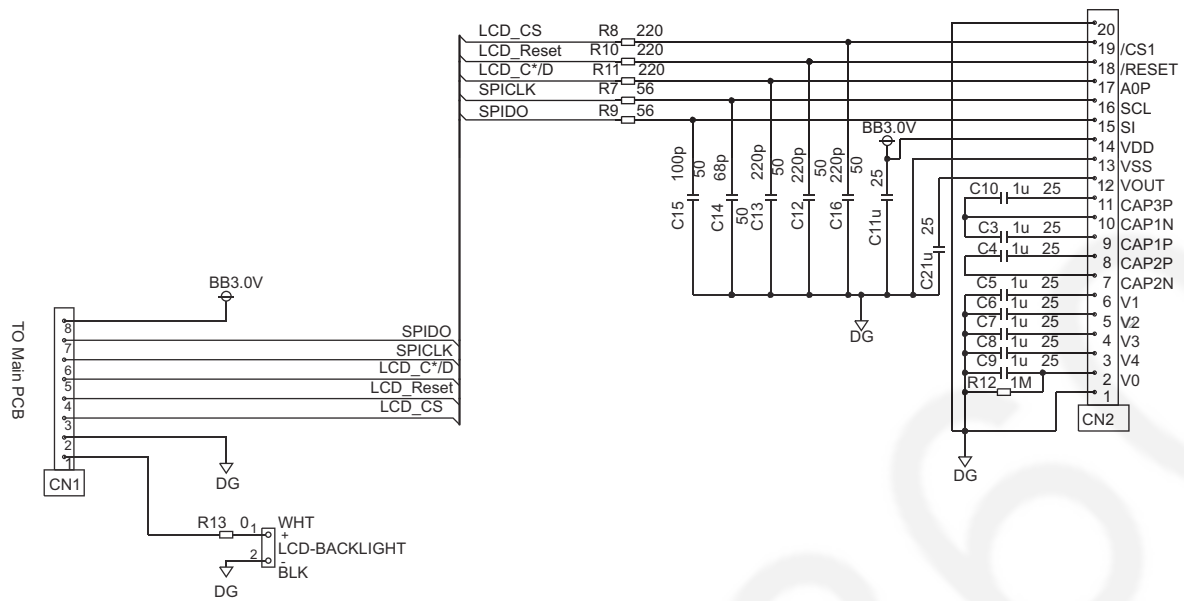
NC: No Components



NC: No Components

KX-TG9581 SCHEMATIC DIAGRAM (Base Unit_Operation)

13.4. Schematic Diagram (Base Unit_LCD)



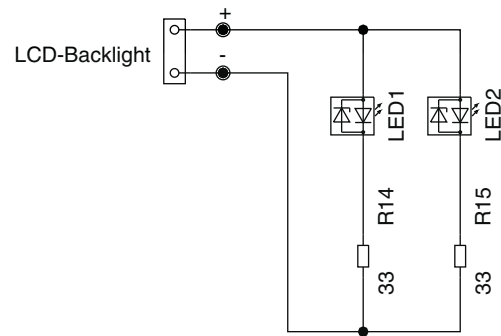
NC: No Components

KX-TG9581 SCHEMATIC DIAGRAM (Base Unit_LCD)

Memo

A0449860

13.5. Schematic Diagram (Base Unit_LED)



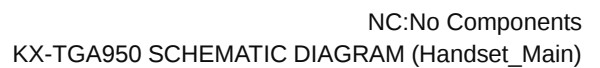
NC: No Components

KX-TG9581 SCHEMATIC DIAGRAM (Base Unit_LED)

Memo

A0449860



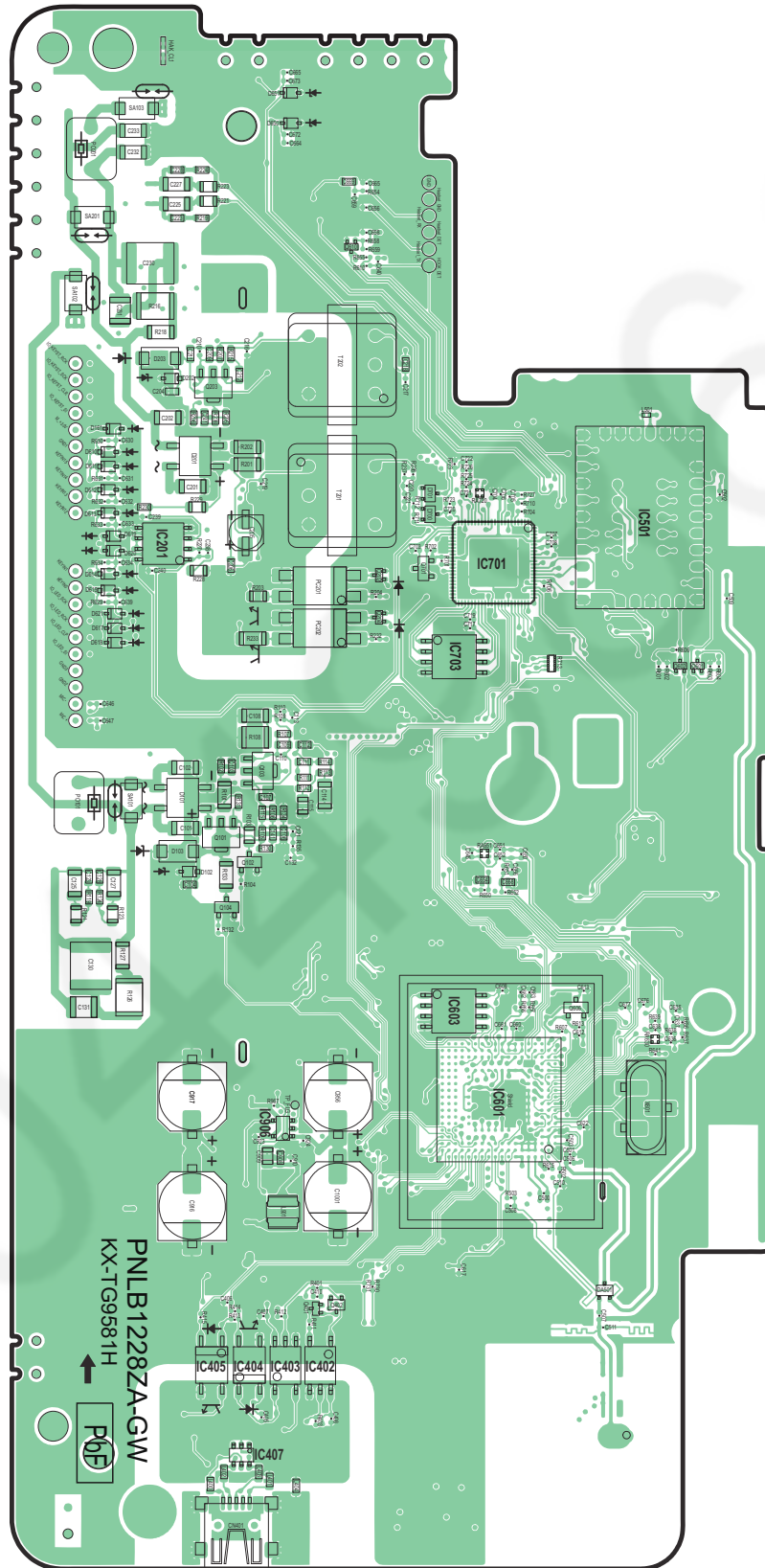


Memo

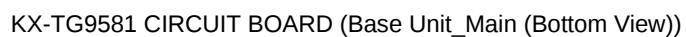
14 Printed Circuit Board

14.1. Circuit Board (Base Unit_Main)

14.1.1. Component View

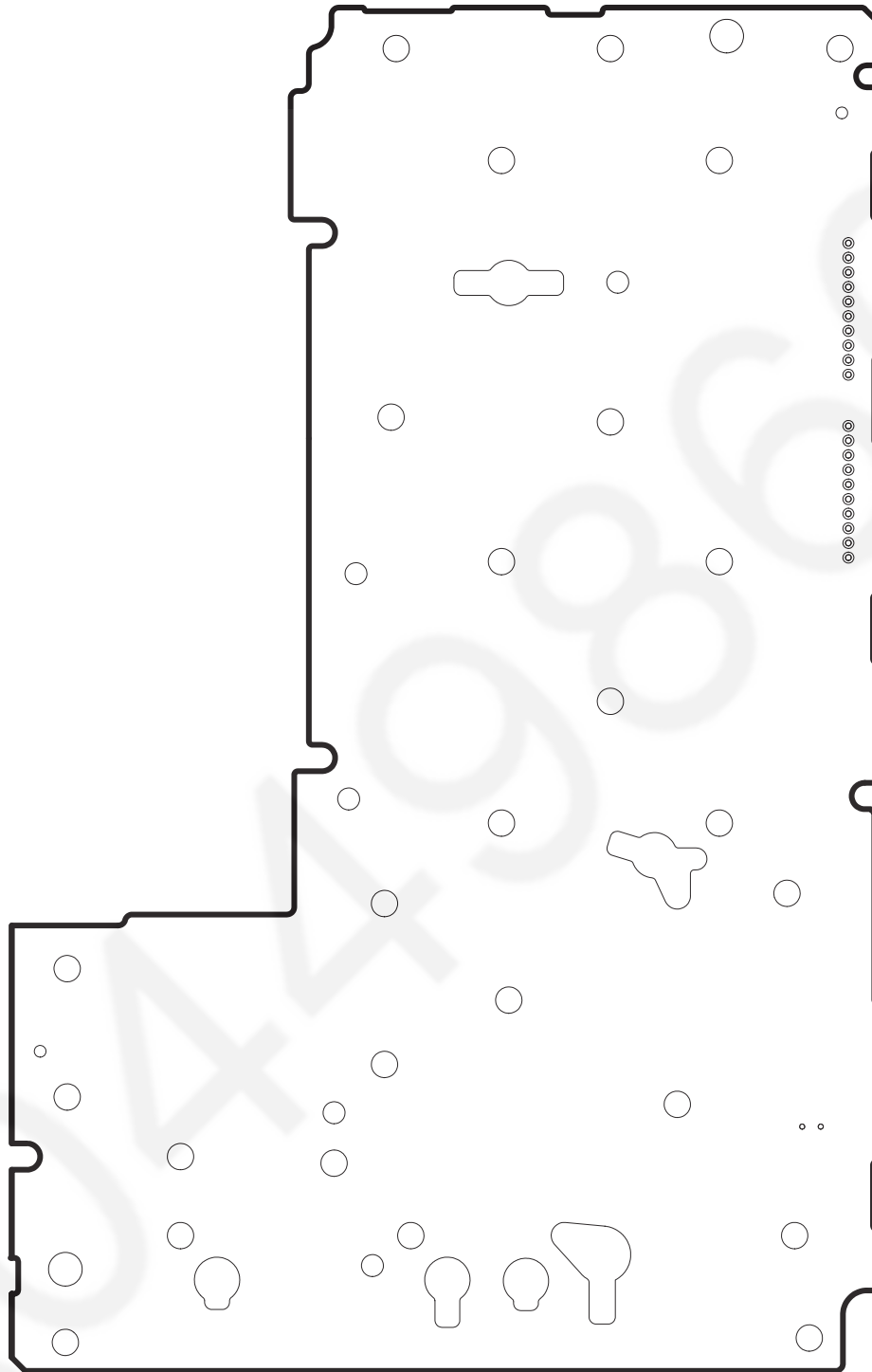


KX-TG9581 CIRCUIT BOARD (Base Unit_Main (Component View))



14.2. Circuit Board (Base Unit_Operation)

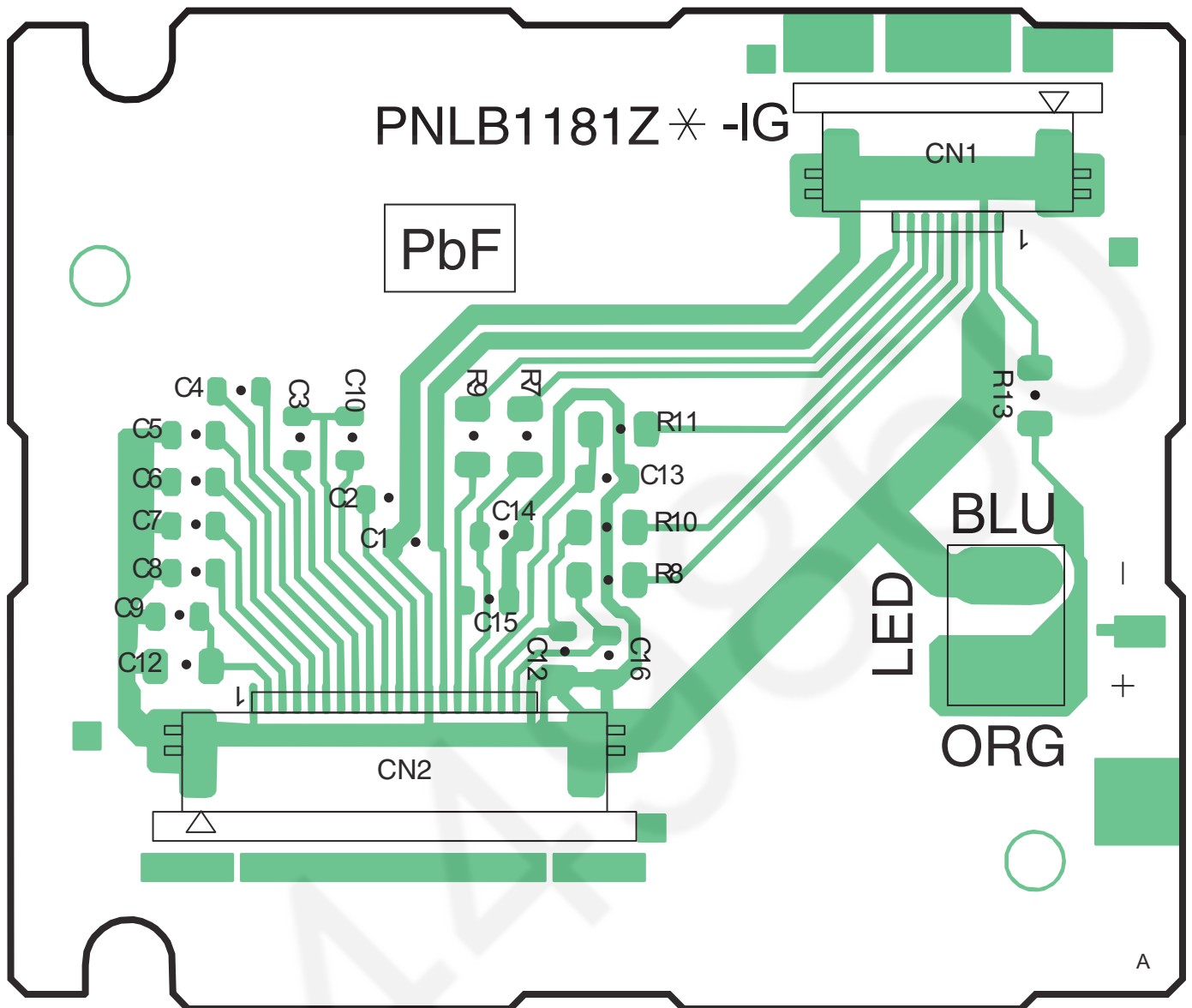
14.2.1. Component View



KX-TG9581 CIRCUIT BOARD (Base Unit_Operation (Component View))



14.3. Circuit Board (Base Unit_LCD)

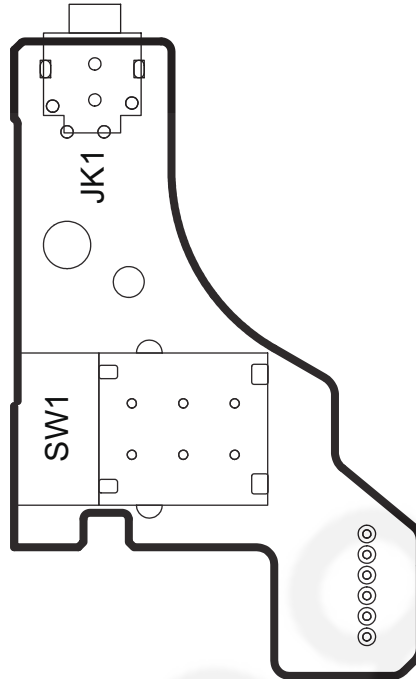


KX-TG9581 CIRCUIT BOARD (Base Unit_LCD (Component View))

Memo

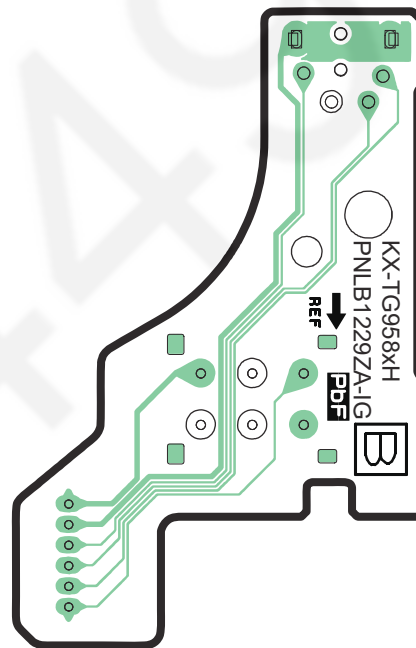
14.4. Circuit Board (Base Unit_TEL Jack)

14.4.1. Component View



KX-TG9581 CIRCUIT BOARD (Base Unit_TEL Jack(Component View))

14.4.2. Bottom View

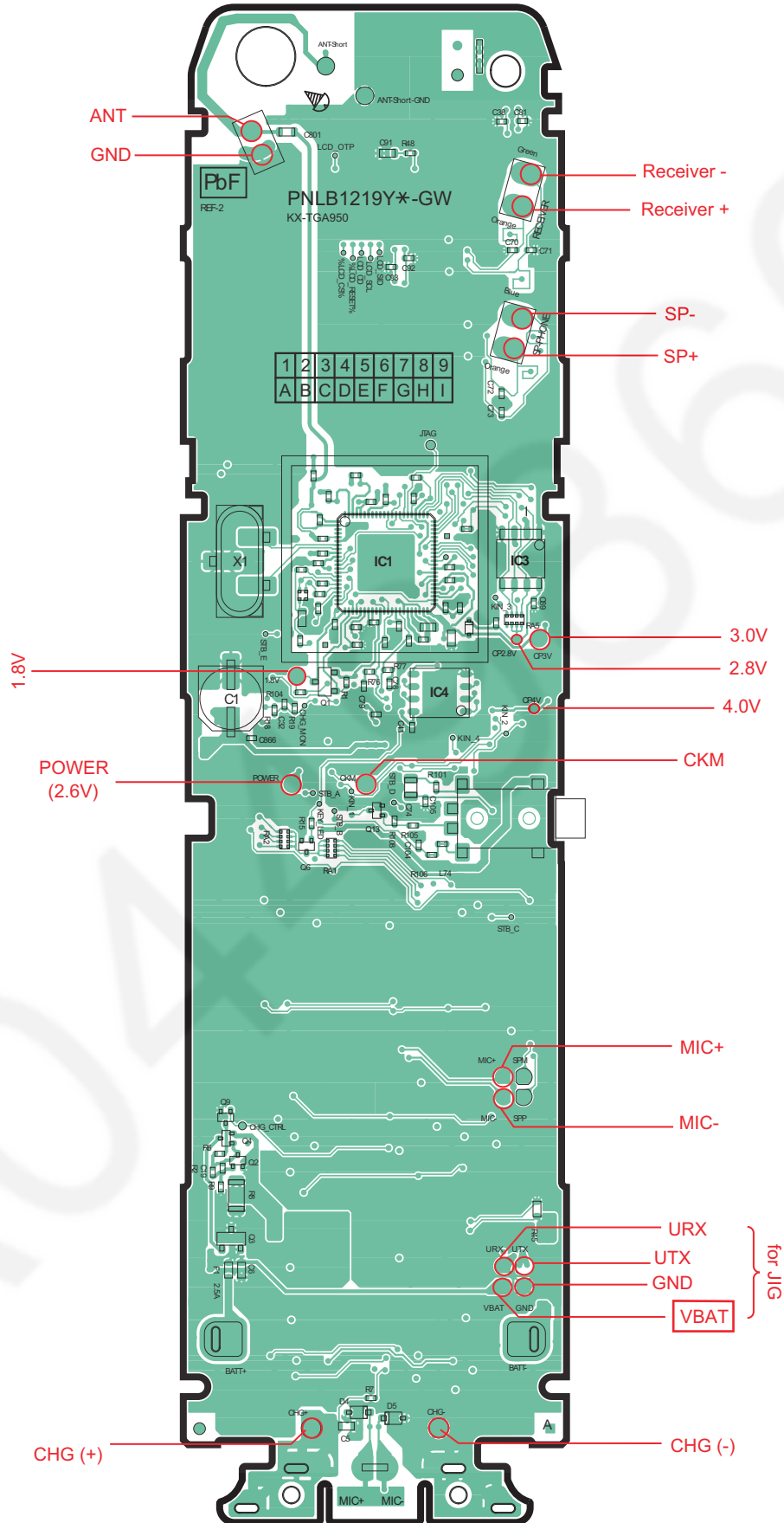


KX-TG9581 CIRCUIT BOARD (Base Unit_TEL Jack (Bottom View))

Memo

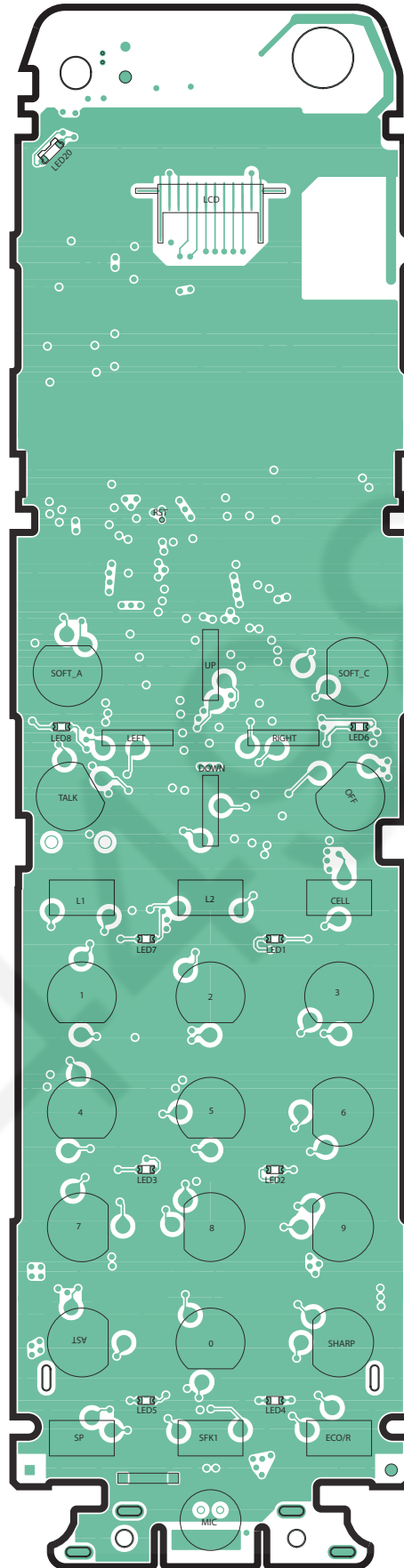
14.5. Circuit Board (Handset)

14.5.1. Component View



KX-TGA950 CIRCUIT BOARD (Handset_Main (Component View))

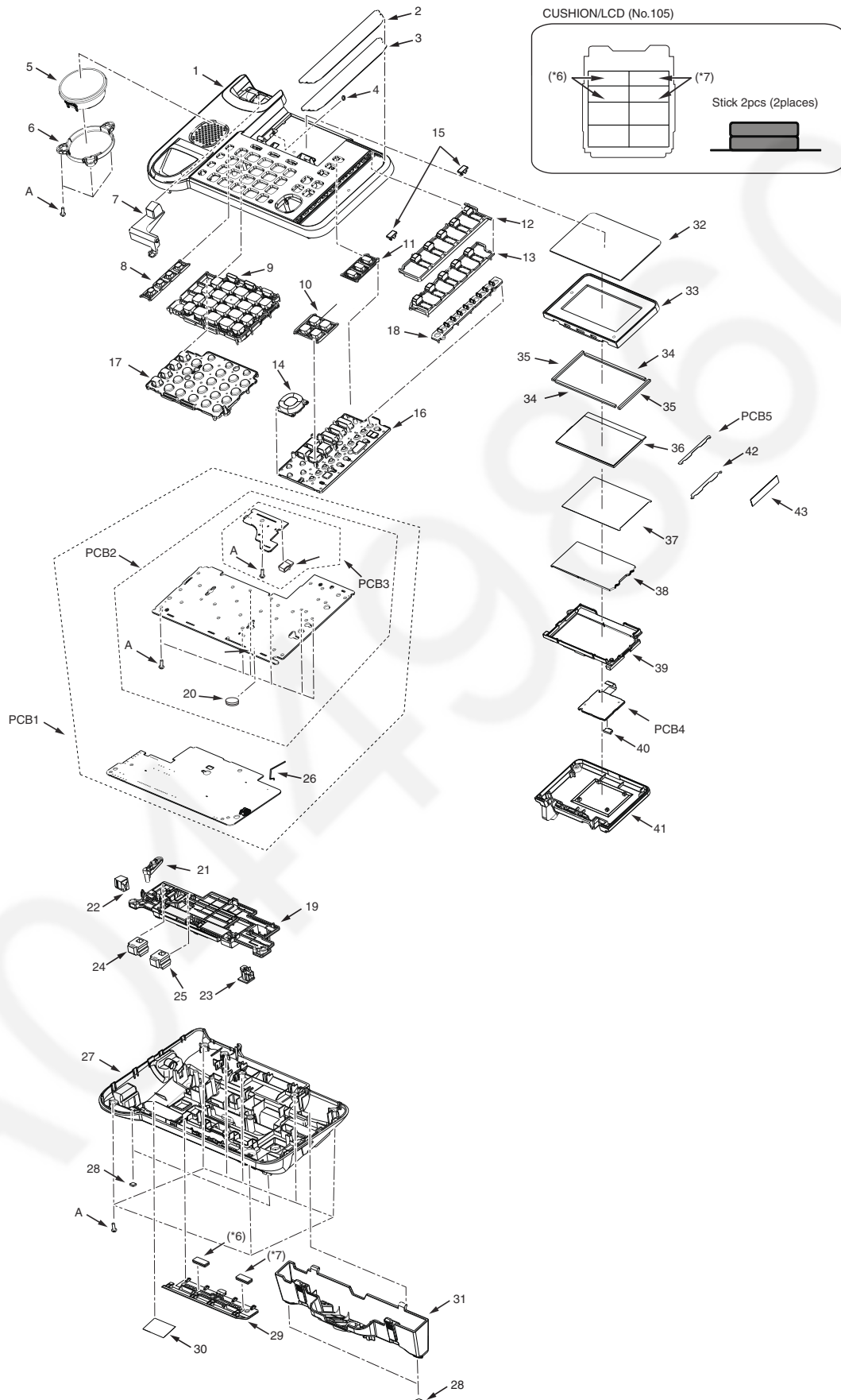
14.5.2. Bottom View



KX-TGA950 CIRCUIT BOARD (Handset_Main (Bottom View))

15 Exploded View and Replacement Parts List

15.1. Cabinet and Electrical Parts (Base Unit)

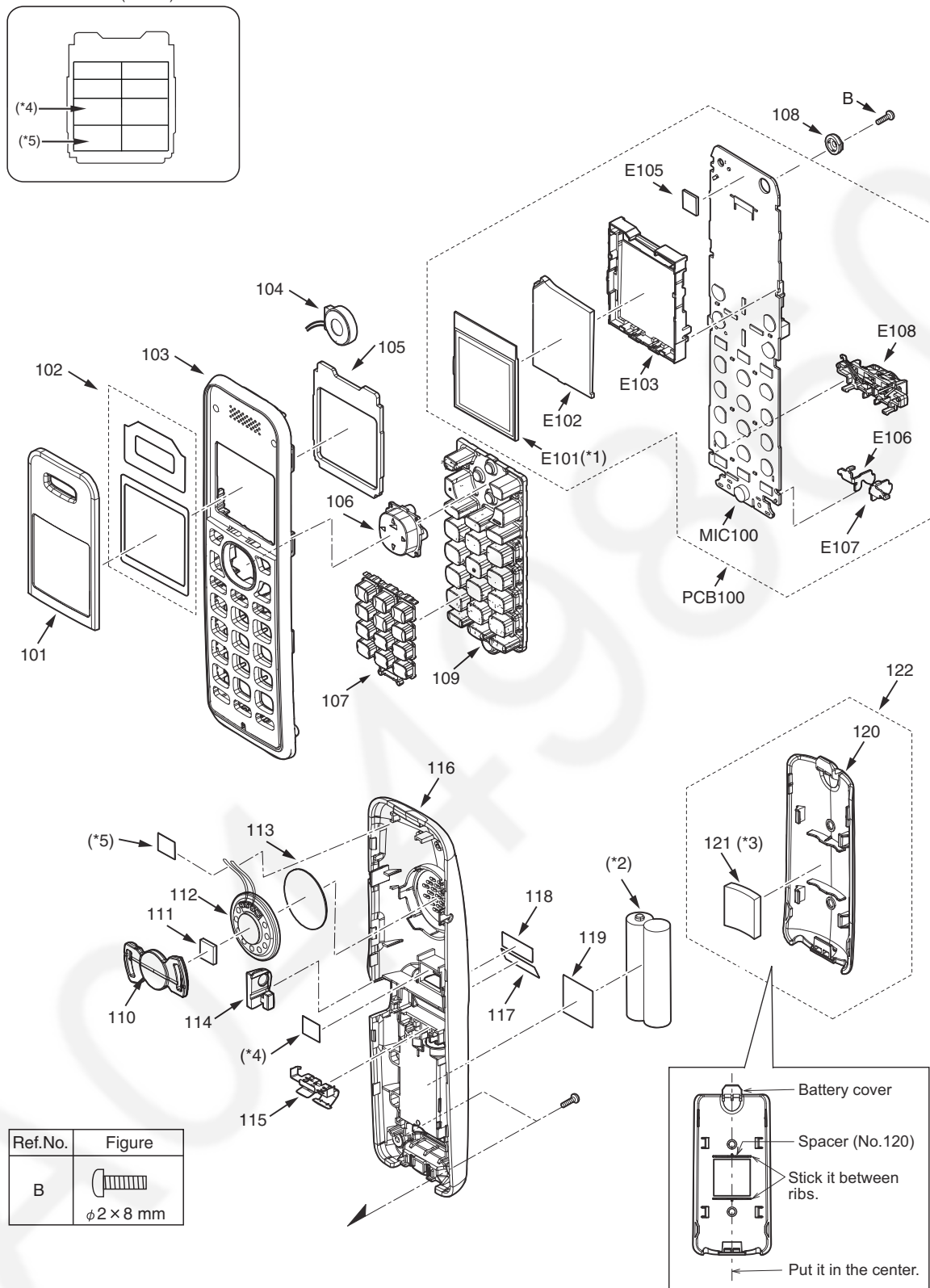


Note:

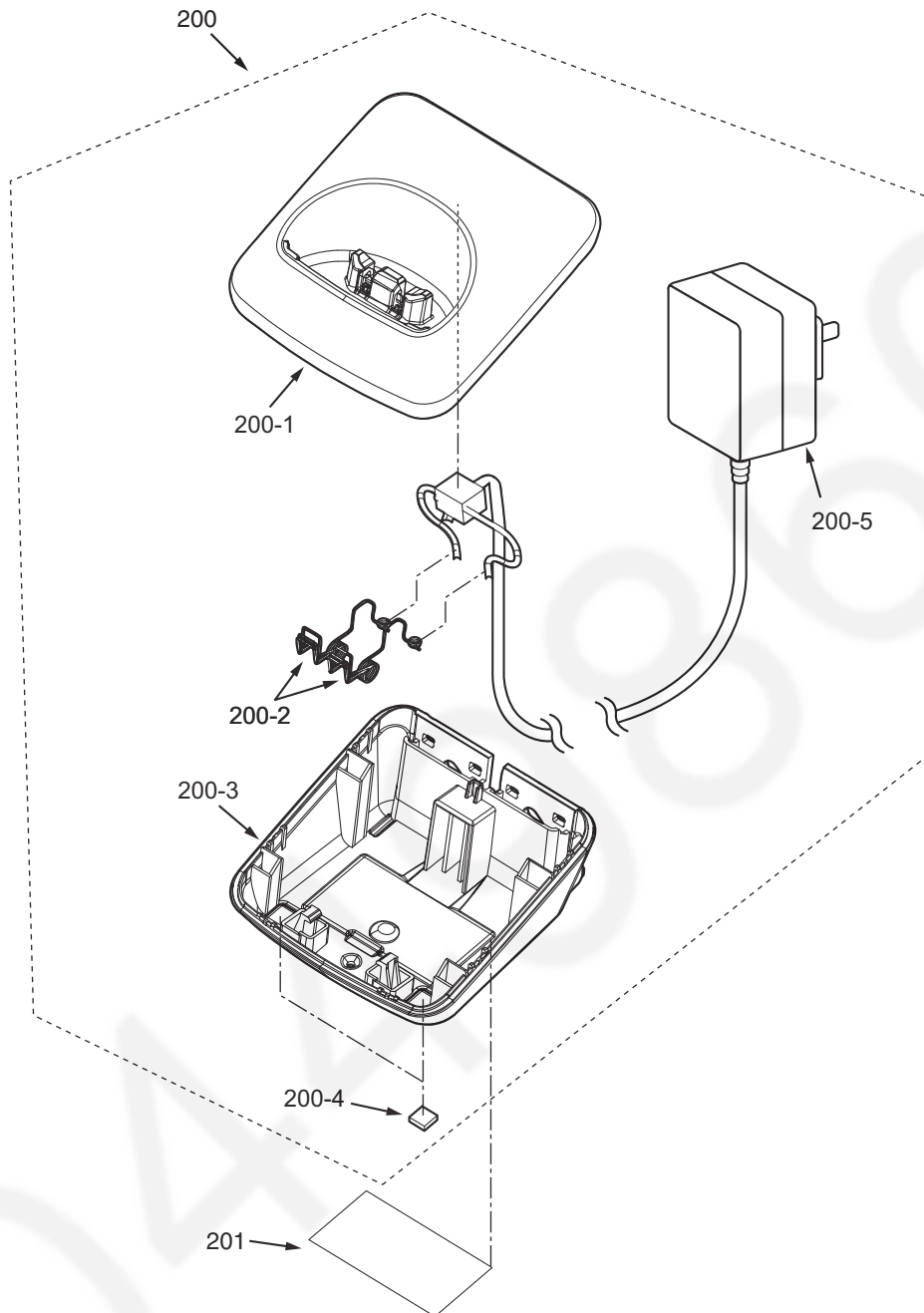
(*6)(*7) This spacer is cut from the excess parts of SPACER (NO.105). Refer to **Cabinet and Electrical Parts (Handset)** (P.98).

15.2. Cabinet and Electrical Parts (Handset)

CUSHION/LCD (No.105)

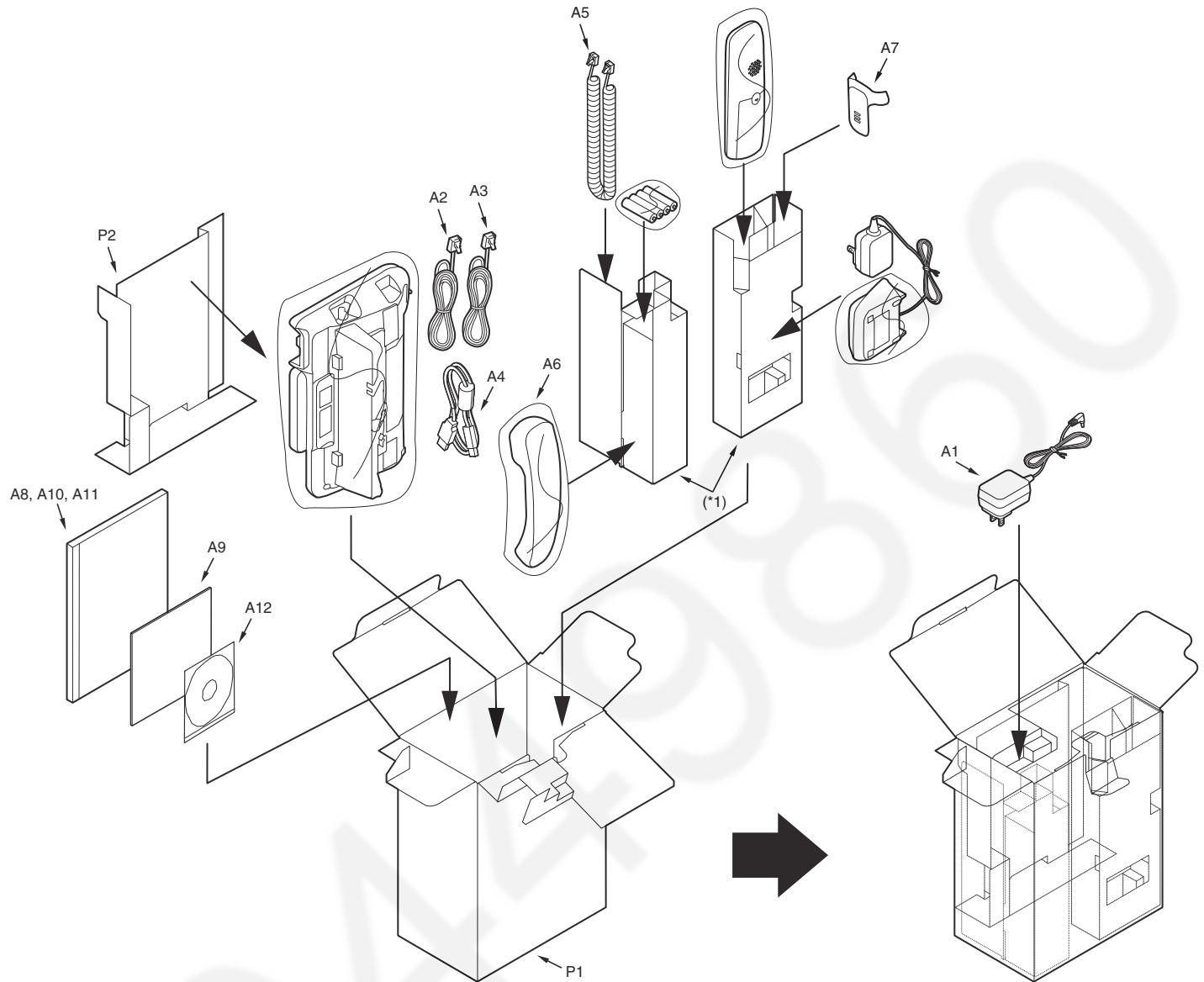


15.3. Cabinet and Electrical Parts (Charger Unit)



15.4. Accessories and Packing Materials

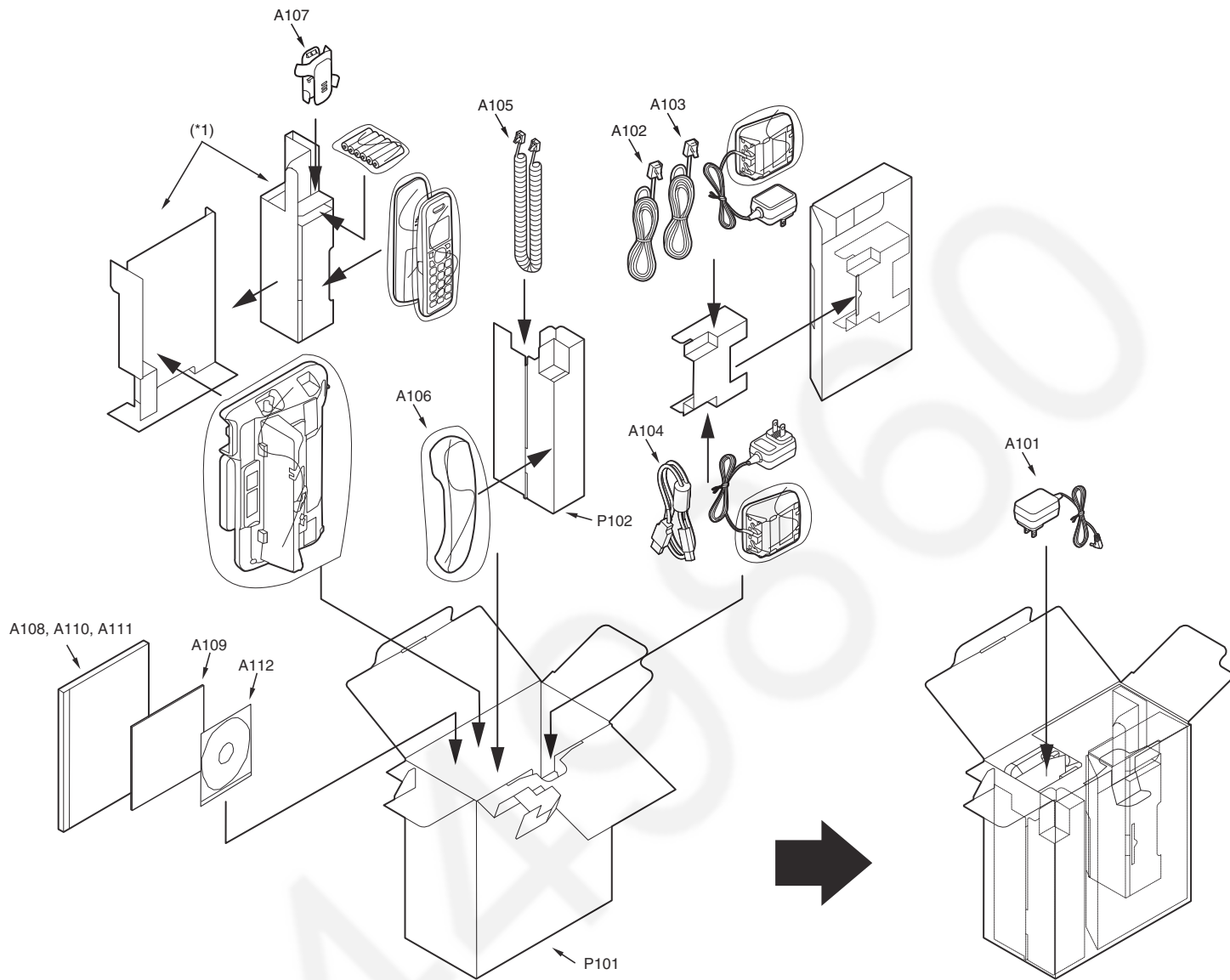
15.4.1. KX-TG9581B



Note:

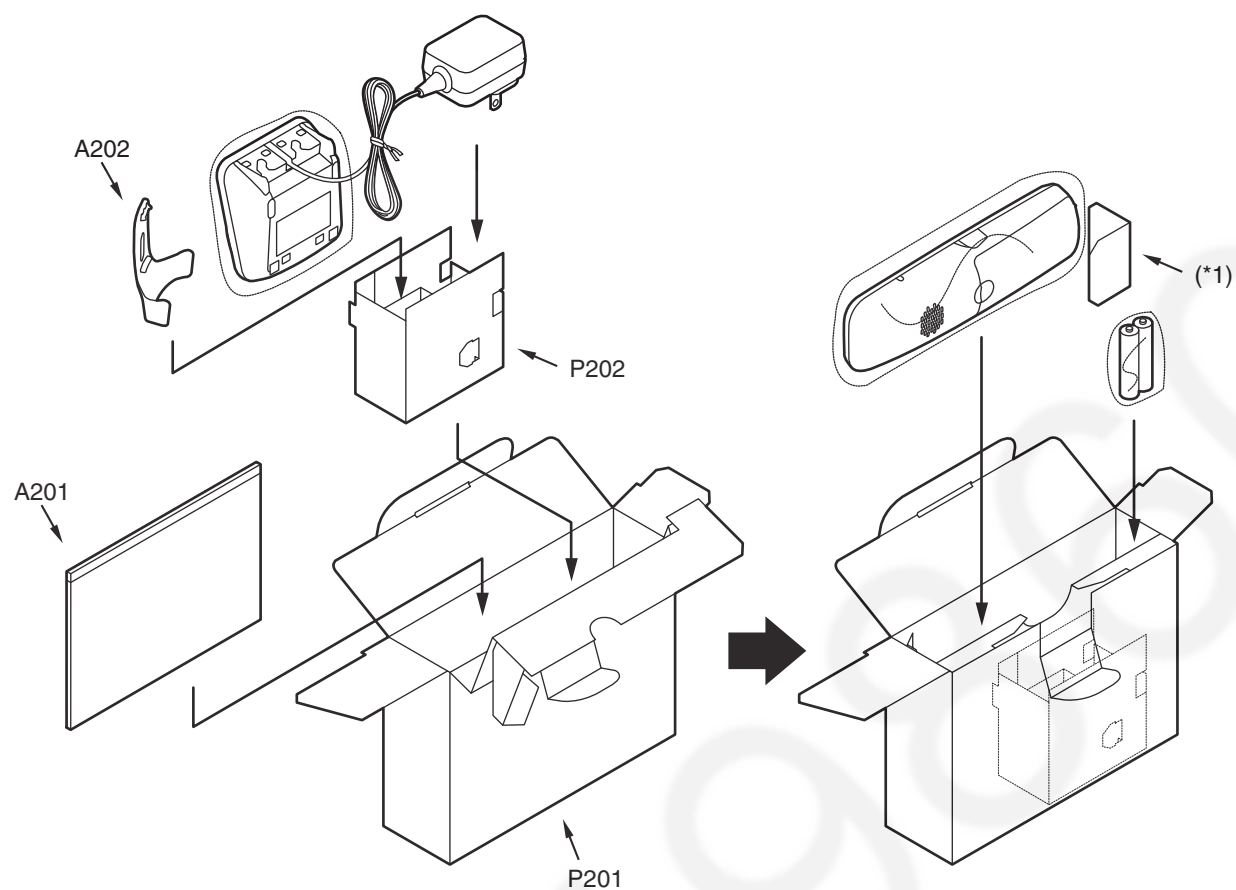
(*1) This pad is a piece of Ref No.P2.

15.4.2. KX-TG9582B

**Note:**

(*) This pad is a piece of Ref No.P102.

15.4.3. KX-TGA950B



Note:

(*1) This pad is is a piece of Ref No.P201 (GIFT BOX).

15.5. Replacement Parts List

1. RTL (Retention Time Limited)

Note:

The "RTL" marking indicates that its Retention Time is Limited. When production is discontinued, this item will continue to be available only for a specific period of time.

This period of time depends on the type of item, and the local laws governing parts and product retention. At the end of this period, the item 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 ERDS:Carbon ERJ:Chip	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Chip ERS:Fusible Resistor ERF:Cement Resistor
--------------------------------------	---	--

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W
------------	------------	---------	------	------	------

*Type & Voltage Of Capacitor

Type

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

Voltage

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

15.5.1. Base Unit

15.5.1.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	1	PNKM1575Z1	CABINET BODY	PS-HB
	2	PNGV1022Z	COVER, TEL CARD	
	3	PNGD1075Z	TEL CARD	
	4	PNHG1106Z	SPACER, RUBBERRING	
	5	L0AA05A00097	SPEAKER	
	6	PNHR2035Z	GUIDE, SPEAKER	POM-HB
	7	PNBH1026Z1	BUTTON, HOOK	PS-HB
	8	PNBX1360Z1	BUTTON, CELL KEY	PMMA-HB
	9	PNBX1362Z1	BUTTON, KEY DIAL	ABS-HB
	10	PNBX1361Z1	BUTTON, PLAY STOP KEY	PMMA-HB
	11	PNBX1359Z1	BUTTON, LINE HEADSET	PMMA-HB
	12	PNBX1396Z1	BUTTON, ONE TOUCH KEY2	ABS-HB
	13	PNBX1394Z1	BUTTON, ONE TOUCH KEY1	ABS-HB
	14	PNBC1510Z1	BUTTON, NAVIGATOR KEY	ABS-HB
	15	PNGX1041Z1	ONE TOUCH KEY APPAREL	ABS-HB
	16	PNJK1238Z	KEYBOARD SWITCH, LINE KEY	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	17	PNJK1199Y	KEYBOARD SWITCH, DIAL	
	18	PNHR2040Z	GUIDE, KEY	
	19	PNVE1023Z	BATTERY TERMINAL W/C	
	20	PQMG10025W	RUBBER PARTS, MIC	
	21	PNHR2036Z	GUIDE, PCB	PS-HB
	22	PQJJ1T030N	JACK, HANDSET	
	23	K2ECYZ000002	JACK, DC	
	24	PQJJ1T039L	JACK, MODULAR	
	25	PNJJ041001U	JACK, MODULAR	
	26	PNLA1138Z	ANTENNA	
	27	PNKF1349Y1	CABINET COVER	PS-HB
	28	PNHA1013Z	RUBBER PARTS, FOOT CUSHION	
	29	PNKK1108Z1	LID, BATTERY	PS-HB
	30	PNGT8907Z	NAME PLATE	S
	31	PNKL1048Z1	STAND, WALL MOUNT	ABS-HB
	32	PNGP1304Z1	PANEL, LCD	S
	33	PNGG1350Y2	GRILLE, LCD	PS-HB
	34	PNHS1528Z	SPACER, LCD (LONG)	
	35	PNHS1529Z	SPACER, LCD (SHORT)	
	36	L5DYBY000042	LIQUID CRYSTAL DISPLAY	
	37	PNHX1514Y	COVER, DIFFUSIONSHEET	
	38	PNHR1858Z	PLATE, LCD	PMMA-HB
	39	PNHR1857Z	GUIDE, LCD	ABS-HB
	40	PNJE1121Z	LEAD WIRE, FFC	
	41	PNKV1229Z1	COVER, LCD	PS-HB
	42	PNHX1689Z	COVER, REFLECTORSHEET	
	43	PNHX1502Z	SHEET, LCD	

15.5.1.2. Main P.C.Board Parts

Note:

(*1) When replacing IC401, IC601, IC604, IC602, IC603. IC703 or X601, data needs to be written to them with PNZZTG9581B. Refer to **How to download the data** (P.62) of **Things to Do after Replacing IC or X'tal** (P.62).

(*2) When replacing IC701 refer to **How to Replace the LLP (Leadless Leadframe Package) IC** (P.72).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB1	PNWP1TG9581H	MAIN P.C.BOARD ASS (IC's)	
	IC201	C0ABBA000233	IC	
	IC401	C1CB00003661	IC(*1)(*2)	
Δ	IC402	B3PBE0000073	IC	
Δ	IC403	B3PBE0000073	IC	
	IC501	PNWP4TG9581H	IC(*2)	
	IC601	C1CB00003611	IC(*1)(*2)	
	IC602	C3FBMY000327	IC(*1)	
	IC603	C3FBMY000312	IC(*1)	
	IC604	PNWI1TG9581H	IC (EEPROM)(*1)	
	IC701	C1CB00003837	IC(*2)	
	IC703	C3FBMY000312	IC(*1)	
	IC901	C0DBAYY00289	IC	
	IC904	PQVIC61CC20N	IC	S
	IC906	C0DBZYY00741	IC (IC FILTERS)	
	L601	J0JCC0000308	IC FILTER	
	L701	J0JCC0000308	IC FILTER	
			(TRANSISTORS)	
	Q101	B1ADGP000008	TRANSISTOR(SI)	
	Q102	B1ABDM000001	TRANSISTOR(SI)	S
	Q103	DSC7003S0L	TRANSISTOR(SI)	
	Q201	B1ADGP000008	TRANSISTOR(SI)	
	Q202	DRC9123J0L	TRANSISTOR(SI)	
	Q203	DSC7003S0L	TRANSISTOR(SI)	
	Q401	DRC9143Z0L	TRANSISTOR(SI)	
	Q402	DSA5001S0L	TRANSISTOR(SI)	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	Q403	2SC6054J0L	TRANSISTOR(SI)	
	Q601	B1ABDF000017	TRANSISTOR(SI)	
	Q602	B1ABDF000017	TRANSISTOR(SI)	
	Q604	DSA2001R0L	TRANSISTOR(SI)	
	Q606	B1ADGE000012	TRANSISTOR(SI)	
	Q607	B1ADGE000012	TRANSISTOR(SI)	
	Q610	B1ABDF000017	TRANSISTOR(SI)	
	Q701	B1ADGE000012	TRANSISTOR(SI)	
	Q702	B1ABDF000017	TRANSISTOR(SI)	
	Q903	B1ZBZ0000074	TRANSISTOR(SI)	
	Q904	B1ABDF000017	TRANSISTOR(SI)	
	Q905	B1ABGE000011	TRANSISTOR(SI)	
	Q906	DRC9143Z0L	TRANSISTOR(SI)	
	Q907	B1ADGE000012	TRANSISTOR(SI)	
	Q908	B1ADGE000012	TRANSISTOR(SI)	
	Q909	DRC9143Z0L	TRANSISTOR(SI)	
	Q911	FM6K62010L	TRANSISTOR(SI)	
	Q956	DRC9143Z0L	TRANSISTOR(SI)	
	Q957	DRC9143Z0L	TRANSISTOR(SI)	
	IC905	FM6K62010L	TRANSISTOR(SI)	
			(DIODES)	
	D1001	DB2X41400L	DIODE(SI)	
	D101	B0EDER000009	DIODE(SI)	S
	D103	PQVDPZT2530	DIODE(SI)	S
	D201	B0EDER000009	DIODE(SI)	
	D203	PQVDPZT2530	DIODE(SI)	S
	D603	B0JCDD000001	DIODE(SI)	
	D610	B0BC4R3A0006	DIODE(SI)	S
	D611	B0BC4R3A0006	DIODE(SI)	S
	D612	B0BC4R3A0006	DIODE(SI)	S
	D613	B0BC4R3A0006	DIODE(SI)	S
	D614	B0BC4R3A0006	DIODE(SI)	S
	D615	B0BC4R3A0006	DIODE(SI)	S
	D700	B0ADEJ000026	DIODE(SI)	
	D701	B0ADEJ000026	DIODE(SI)	
	D901	DB2X41400L	DIODE(SI)	
	D902	DB2J31300L	DIODE(SI)	
	D904	B0BC4R7A0268	DIODE(SI)	S
	DA501	B0DDCD000001	DIODE(SI)	
	IC407	B0ZBZ0000146	DIODE(SI)	
			(COILS)	
	L400	J0JHC0000045	COIL	
	L401	J0JHC0000045	COIL	
	L402	J0JCC0000280	COIL	
	L403	J0JCC0000280	COIL	
	L404	J0JHC0000045	COIL	
	L501	G1C4N7Z00006	COIL	
	L650	PQLQR2KA20T	COIL	S
	L651	PQLQR2KA20T	COIL	S
	L652	PQLQR2KA20T	COIL	S
	L653	PQLQR2KA20T	COIL	S
	L901	G1C6R8MA0395	COIL	
	L902	G1C6R8MA0203	COIL	
	L966	G1C100MA0395	COIL	
			(RESISTOR ARRAYS)	
	RA501	D1H810240004	COMPONENTS PARTS	S
	RA630	EXB24V102JX	COMPONENTS PARTS	
	RA651	EXB24V222J	COMPONENTS PARTS	
	RA720	EXB24V102JX	COMPONENTS PARTS	
			(PHOTO ELECTRIC TRANS-DUCERS)	
	PC201	B3PBB0000039	PHOTO ELECTRIC TRANS-DUCER	
⚠	IC404	B3PBA0000297	PHOTO ELECTRIC TRANS-DUCER	
⚠	IC405	B3PBA0000138	PHOTO ELECTRIC TRANS-DUCER	
			(VARISTORS)	
	SA101	J0LE00000047	VARISTOR	
	SA103	J0LE00000047	VARISTOR	
	SA201	J0LE00000047	VARISTOR	
			(CONNECTORS)	
	CN401	K1FY105E0025	CONNECTOR	
	CN601	K1MN08BA0111	CONNECTOR	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
			(RESISTORS)	
	R101	PQ4R18XJ106	10M	S
	R102	ERJ36EYJ154	150k	S
	R103	PQ4R10XJ472	4. 7k	S
	R104	ERJ26EJ222	2. 2k	S
	R105	ERJ36EYJ273	27k	S
	R106	ERJ36EYJ562	5. 6k	S
	R107	ERJ36EYJ104	100k	S
	R108	D0GG390JA007	39	
	R109	D0GA104JA021	100k	S
	R110	D0GA104JA021	100k	S
	R111	ERJ36EYJ393	39k	S
	R112	ERJ36EYJ820	82	S
	R113	ERJ36EYJ821	820	S
	R115	ERJ36EYJ472	4. 7k	S
	R119	ERJ36EYJ565	5. 6M	S
	R121	PQ4R10XJ184	180k	S
	R123	PQ4R10XJ184	180k	S
	R124	ERJ36EYJ565	5. 6M	S
	R130	ERJ36EYJ472	4. 7k	S
	R131	ERJ36EYJ104	100k	S
	R134	ERJ36EYJ822	8. 2k	S
	R135	D0GA332JA015	3. 3k	S
	R201	PQ4R18XJ106	10M	S
	R202	PQ4R18XJ106	10M	S
	R203	PQ4R10XJ472	4. 7k	S
	R204	ERJ26EJ222	2. 2k	S
	R205	ERJ36EYJ123	12k	S
	R206	ERJ36EYJ102	1k	S
	R207	ERJ36EYJ104	100k	S
	R208	D0GG390JA007	39	
	R210	ERJ36EYJ223	22k	S
	R211	ERJ36EYJ153	15k	S
	R212	ERJ36EYJ820	82	S
	R213	ERJ36EYJ821	820	S
	R215	ERJ36EYJ222	2. 2k	S
	R219	ERJ36EYJ565	5. 6M	S
	R221	PQ4R10XJ684	680k	S
	R223	PQ4R10XJ684	680k	S
	R224	ERJ36EYJ565	5. 6M	S
	R227	ERJ26EJ564	560k	S
	R228	PQ4R10XJ825	8. 2M	S
	R229	PQ4R10XJ825	8. 2M	S
	R230	ERJ36EYJ564	560k	S
	R231	ERJ36EYJ104	100k	S
	R236	D0GA332JA015	3. 3k	S
	R237	D0GA123JA021	12k	S
	R238	ERJ36EYJ822	8. 2k	S
	R401	ERJ26EJ153	15k	S
	R403	ERJ26EJ182	1. 8k	S
	R404	ERJ26EJ101	100	S
	R405	D0GA221JA021	220	S
	R406	ERJ26EJ391	390	S
	R407	D0GA123JA021	12k	S
	R408	ERJ26EJ472X	4. 7k	S
	R409	D0GA102JA021	1k	S
	R411	ERJ26EJ181	180	S
	R412	D0GA103JA021	10k	S
	R413	ERJ26EJ222	2. 2k	S
	R414	ERJ26EJ101	100	S
	R415	ERJ26EJ151	150	S
	R502	D0GA221JA021	220	S
	R503	D0GA221JA021	220	S
	R601	ERJ2RKF4702	47k	
	R602	ERJ2RKF3302	33k	S
	R603	ERJ26EJ184	180k	S
	R604	D0GA124JA015	120k	S
	R606	ERJ26EJ223	22k	S
	R607	D0GA332JA015	3. 3k	S
	R609	D0GA102JA021	1k	S
	R610	ERJ26EJ473	47k	S
	R612	D0GA103JA021	10k	S
	R613	D0GA103JA021	10k	S

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R615	D0GA563ZA006	56k	
	R616	ERJ2GEJ561	560	S
	R617	ERJ2RKF1302	13k	
	R618	ERJ2RKF5601	5.6k	
	R624	D0GA332JA015	3.3k	S
	R629	D0GA102JA021	1k	S
	R630	D0GA102JA021	1k	S
	R631	D0GA102JA021	1k	S
	R632	D0GA102JA021	1k	S
	R633	D0GA102JA021	1k	S
	R634	D0GA102JA021	1k	S
	R635	D0GA104JA021	100k	S
	R636	ERJ2GEJ394	390k	S
	R637	D0GA392JA015	3.9k	S
	R638	ERJ2GEJ473	47k	S
	R639	ERJ2GEJ473	47k	S
	R640	D0GA102JA021	1k	S
	R641	D0GA102JA021	1k	S
	R644	D0GA102JA021	1k	S
	R645	ERJ3GEYJ1R0	1	S
	R646	ERJ3GEYJ1R0	1	S
	R650	ERJ2GEJ391	390	S
	R651	D0GA152JA021	1.5k	S
	R652	ERJ2GEJ391	390	S
	R654	ERJ2GEJ100	10	S
	R655	D0GA104JA021	100k	S
	R656	D0GA1R0JA014	1	S
	R657	D0GA1R0JA014	1	S
	R658	ERJ2GEJ473	47k	S
	R659	D0GA104JA021	100k	S
	R662	ERJ2GEJ222	2.2k	S
	R663	ERJ2GEJ222	2.2k	S
	R670	D0GA102JA021	1k	S
	R671	D0GA102JA021	1k	S
	R692	ERJ2GEJ101	100	S
	R701	D0GA332JA015	3.3k	S
	R702	D0GA103JA021	10k	S
	R703	ERJ2GEJ271	270	S
	R704	D0GA563ZA006	56k	
	R706	D0GA102JA021	1k	S
	R709	D0GA104JA021	100k	S
	R710	D0GA104JA021	100k	S
	R711	D0GA102JA021	1k	S
	R712	D0GA102JA021	1k	S
	R713	EXB28V561JX	560	
	R723	ERJ2GEJ563	56k	S
	R724	ERJ2GEJ563	56k	S
	R725	D0GA392JA015	3.9k	S
	R726	ERJ2GEJ394	390k	S
	R727	D0GA104JA021	100k	S
	R730	D0GA102JA021	1k	S
	R731	D0GA102JA021	1k	S
	R902	ERJ2GEJ222	2.2k	S
	R903	ERJ6RSJR10V	0.1	
	R904	ERJ2GEJ470	47	S
	R906	ERJ2GEJ470	47	S
	R907	ERJ3GEYJ120	12	S
	R908	ERJ3GEYJ102	1k	S
	R909	D0GA104JA021	100k	S
	R910	ERJ3EKF2403	240k	
	R913	ERJ3GEYJ100	10	S
	R914	ERJ2RKF1200	120	
	R915	ERJ2RKF6800	680	
	R917	ERJ3EKF1003	100k	
	R919	ERJ2RKF1502	15k	
	R920	ERJ2RKF6801	6.8k	
	R921	ERJ2RKF1001	1k	
	R929	D0GBR10JA113	0.1	
	R930	ERJ2RKF1601	1.6k	
	R931	ERJ2RKF1102	11k	
	R932	ERJ2GEJ222	2.2k	S
	R967	ERJ2GEJ105X	1M	S
	R969	D0GA102JA021	1k	S

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R971	ERJ2RKF2203X	220k	S
	R972	ERJ2RKF1203	120k	
	R978	ERJ2GEJ473	47k	S
	R979	ERJ2GEJ473	47k	S
			(CAPACITORS)	
	C1002	ECUE1A104KBQ	0.1	
	C101	F1K2H681A008	680	S
	C102	F1K2H681A008	680	S
	C103	ECUV1H103KBV	0.01	
	C104	ECUV1H103KBV	0.01	
	C106	ECUV1H472KBV	0.0047	
	C109	ECUV1H472KBV	0.0047	
	C112	ECUV1C105KBV	1	
	C113	ECUE1A104KBQ	0.1	
	C114	F1K1C4750023	4.7	
	C121	ECUE1A104KBQ	0.1	
	C123	ECUV1H103KBV	0.01	
	C125	F1K2H681A008	680p	S
	C127	F1K2H681A008	680p	S
	C128	ECUV1H103KBV	0.01	
	C132	ECUE1E682KBQ	0.0068	
	C141	ECUV1H102KBV	0.001	
	C204	ECUV1H103KBV	0.01	
	C205	EEE1CA100SR	10	
	C206	ECUV1H472KBV	0.0047	
	C209	ECUV1H472KBV	0.0047	
	C212	ECUV1C105KBV	1	
	C213	ECUV1C105KBV	1	
	C214	F1K1C4750023	4.7	
	C216	ECUE1C103KBQ	0.01	
	C217	ECUE1C103KBQ	0.01	
	C218	ECUV1A225KBV	2.2	
	C219	ECUE1C103KBQ	0.01	
	C220	ECUE1C103KBQ	0.01	
	C221	ECUE0J105KBQ	1	
	C223	ECUV1H103KBV	0.01	
	C225	F1K3A101A017	100p	
	C227	F1K3A101A017	100p	
	C228	ECUV1H103KBV	0.01	S
	C232	F1K3A101A017	100p	
	C233	F1K3A101A017	100p	
	C238	ECJ0EB1A563K	0.056	
	C239	ECJ0EB1A563K	0.056	S
	C241	ECUV1H272KBV	0.0027	
	C401	PQCUV0J475MB	4.7	
	C402	ECUE1A104KBQ	0.1	
	C403	ECUV1A105KBV	1	
	C404	PQCUV0J475MB	4.7	
	C405	ECUE1H101JCQ	100p	
	C406	ECUE1H102KBQ	0.001	
	C407	ECUE1A104KBQ	0.1	
	C408	ECUE0J105KBQ	1	
	C409	F1G1H331A541	330p	S
	C410	ECUE1H101JCQ	100p	
	C500	F1G1HR80A765	0.8	
	C501	F1G1H1R8A765	1.8	
	C502	ECUE1A104KBQ	0.1	
	C503	F1G1H2R7A765	2.7p	
	C506	ECUE1H100DCQ	10p	
	C507	ECUE1H100DCQ	10p	
	C508	ECUE1H100DCQ	10p	
	C509	ECUE1H100DCQ	10p	
	C510	ECUE1H100DCQ	10p	
	C511	F1G1H1R0A765	1	
	C601	ECUE1A104KBQ	0.1	
	C602	ECUE1A104KBQ	0.1	
	C603	ECUE1A104KBQ	0.1	
	C604	ECUE0J105KBQ	1	
	C605	ECUE1A104KBQ	0.1	
	C606	ECUE1A104KBQ	0.1	
	C607	ECUE1A104KBQ	0.1	
	C608	ECUE1A104KBQ	0.1	
	C609	ECUE1A104KBQ	0.1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C610	ECUE1A104KBQ	0.1	
	C612	ECUE1A104KBQ	0.1	
	C613	ECUE0J105KBQ	1	
	C614	ECUE0J105KBQ	1	
	C615	ECUE0J105KBQ	1	
	C617	ECUE0J105KBQ	1	
	C619	ECUE1H100DCQ	10p	
	C620	ECUE1A104KBQ	0.1	
	C621	ECUV1A225KBV	2.2	
	C622	ECUE0J105KBQ	1	
	C629	ECJ1VB0G106M	10	S
	C635	ECJ0EB1C822K	0.0082	S
	C636	ECUE1H821KBQ	820p	
	C638	ECUE1H821KBQ	820p	
	C646	ECUE1C103KBQ	0.01	
	C647	ECUE1C103KBQ	0.01	
	C651	ECUE1A104KBQ	0.1	
	C652	ECUE1A104KBQ	0.1	
	C654	ECJ1VB0G106M	10	S
	C655	ECUE1H102KBQ	0.001	
	C656	ECUE1H390JCQ	39p	
	C662	ECUE1H332KBQ	0.0033	
	C663	ECUE1H332KBQ	0.0033	
	C664	ECUE1H152KBQ	0.0015	
	C665	ECUE1H152KBQ	0.0015	
	C666	ECUE1A104KBQ	0.1	
	C667	ECUE1C103KBQ	0.01	
	C668	ECJ1VB0G106M	10	S
	C669	ECJ1VB0G106M	10	S
	C670	ECUE1H102KBQ	0.001	
	C675	ECUE1H102KBQ	0.001	
	C676	ECUE1H102KBQ	0.001	
	C677	ECUE1H102KBQ	0.001	
	C684	ECUE1H222KBQ	0.0022	
	C687	ECUE1H222KBQ	0.0022	
	C689	ECUV1H102KBV	0.001	
	C690	ECUE1A104KBQ	0.1	
	C691	ECUE1A104KBQ	0.1	
	C692	ECJ1VB0G106M	10	S
	C693	ECUE1H331KBQ	330p	
	C702	ECUE1A104KBQ	0.1	
	C703	ECUE0J105KBQ	1	
	C705	ECUE0J105KBQ	1	
	C706	ECUE1A104KBQ	0.1	
	C708	ECUE1A104KBQ	0.1	
	C709	ECUE1A104KBQ	0.1	
	C710	ECUE1A104KBQ	0.1	
	C713	ECUE1A104KBQ	0.1	
	C717	ECUE1H100DCQ	10p	
	C719	ECUE1A104KBQ	0.1	
	C720	ECUE1H681KBQ	680p	
	C721	ECUE1H681KBQ	680p	
	C723	ECUE1H222KBQ	0.0022	
	C901	PQCUV0J475MB	4.7	
	C902	ECUV1C105KBV	1	
	C907	ECUE0J105KBQ	1	
	C909	F1J0J2260004	22	
	C911	ECUV0J105KBV	1	
	C912	ECUE1C103KBQ	0.01	
	C913	ECUE1H102KBQ	0.001	
	C914	F1J0J2260004	22	
	C915	ECUE1H222KBQ	0.0022	
	C916	F2G1A4710013	470	
	C918	ECUE1H6R0DCQ	6	
	C920	F1J1C106A059	10	
	C921	F1J1C106A059	10	
	C922	ECUE1A104KBQ	0.1	
	C923	ECUE0J105KBQ	1	
	C924	ECUE0J105KBQ	1	
	C952	ECUE1A104KBQ	0.1	
	C953	ECUE1A104KBQ	0.1	
	C956	F2G1A4710013	470	
			(FUSE)	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	F900	ERBRD3R00X	FUSE	
⚠	F901	ERBRD2R50X	FUSE	
			(OTHERS)	
	P0101	D4DAY220A022	THERMISTOR	
	P0201	D4DAY220A022	THERMISTOR	
	T201	PFLT8D001	TRANSFORMER	
	T202	PFLT8D001	TRANSFORMER	
	X601	H0J103500038	CRYSTAL OSCILLATOR (*1)	

15.5.1.3. Operational P.C.Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB2	PNWP2TG9581H	MAIN P.C.BOARD ASS'Y (RTL)	
			(ICs)	
	IC101	C0JBAQ000247	IC	
	IC102	C0JBAQ000247	IC	
	IC103	C0JBAQ000247	IC	
			(TRANSISTOR)	
	Q101	PSVTUMG11NTR	TRANSISTOR(SI)	S
	Q102	PSVTUMG11NTR	TRANSISTOR(SI)	S
	Q103	PSVTUMG11NTR	TRANSISTOR(SI)	S
	Q104	PSVTUMG11NTR	TRANSISTOR(SI)	S
	Q105	PSVTUMG11NTR	TRANSISTOR(SI)	S
	Q106	PSVTUMG11NTR	TRANSISTOR(SI)	S
			(DIODES)	
	D120	1SS355	DIODE(SI)	S
	D121	1SS355	DIODE(SI)	S
	D122	1SS355	DIODE(SI)	S
	D123	1SS355	DIODE(SI)	S
	D124	1SS355	DIODE(SI)	S
	D125	1SS355	DIODE(SI)	S
	D126	1SS355	DIODE(SI)	S
	D127	1SS355	DIODE(SI)	S
			(LEDS)	
	LED101	B3AAB0000550	DIODE(SI)	
	LED102	B3AAB0000550	DIODE(SI)	
	LED103	B3AAB0000550	DIODE(SI)	
	LED104	B3AAB0000550	DIODE(SI)	
	LED105	B3ABB0000294	DIODE(SI)	
	LED106	B3ABB0000294	DIODE(SI)	
	LED107	B3AAB0000550	DIODE(SI)	
	LED108	B3AAB0000550	DIODE(SI)	
	LED109	B3ABB0000294	DIODE(SI)	
	LED110	B3ABB0000294	DIODE(SI)	
	LED111	B3AAB0000550	DIODE(SI)	
	LED112	B3ABB0000294	DIODE(SI)	
	LED113	B3ABB0000294	DIODE(SI)	
			(IC FILTERS)	
	L1	J0JCC0000276	IC FILTER	
	L2	J0JCC0000276	IC FILTER	
			(RESISTORS)	
	R101	ERJ36EYJ151	150	
	R102	ERJ36EYJ151	150	S
	R103	ERJ36EYJ151	150	S
	R104	ERJ36EYJ331	330	S
	R105	ERJ26EJ101	100	S
	R106	ERJ26EJ101	100	S
	R107	ERJ26EJ151	150	S
	R108	ERJ26EJ151	150	S
	R109	ERJ26EJ151	150	S
	R110	ERJ26EJ151	150	S
	R111	ERJ26EJ151	150	S
	R112	ERJ26EJ101	100	S
	R113	ERJ26EJ101	100	S
	R114	ERJ36EY0R00	0	S
	R115	ERJ36EY0R00	0	S
			(CAPACITORS)	
	C101	ECUV1C104KBV	0.1	
	C102	ECUE1C104KBQ	0.1	
	C103	ECUE1C104KBQ	0.1	
	C128	ECUE1C103KBQ	0.01	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
			OTHERS	
	MIC	L0CBAY000123	BUILTIN-MICROPHONE	

15.5.1.4. Jack P.C.Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB3	PNLB1229Z-1	P.C.BOARD ONLY (JACKS)	
	JK1	PQJJ1C001Z	JACK, HEADSET	
	SW1	K0L1LB000021	SPECIAL SWITCH	

15.5.1.5. LCD P.C.Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB5	PNWP3TG9541H	LCD RELAY P.C.BOARD ASS'Y (RTL) (RESISTORS)	
	R7	PQ4R10XJ560	56	S
	R8	PQ4R10XJ221	220	S
	R9	PQ4R10XJ560	56	S
	R10	PQ4R10XJ221	220	S
	R11	PQ4R10XJ221	220	S
	R12	PQ4R10XJ105	1M	S
	R13	PQ4R10XJ000	0	S
			(CAPACITORS)	
	C1	F1H1E1050001	1	
	C2	F1H1E1050001	1	
	C3	F1H1E1050001	1	
	C4	F1H1E1050001	1	
	C5	F1H1E1050001	1	
	C6	F1H1E1050001	1	
	C7	F1H1E1050001	1	
	C8	F1H1E1050001	1	
	C9	F1H1E1050001	1	
	C10	F1H1E1050001	1	
	C12	ECUV1H221JCV	220p	
	C13	ECUV1H221JCV	220p	
	C14	ECUV1H680JCV	68p	
	C15	ECUV1H101JCV	100p	
	C16	ECUV1H221JCV	220p	
			(CONNECTORS)	
	CN1	K1MN08BA0111	CONNECTOR	
	CN2	K1MN20BA0111	CONNECTOR	

15.5.1.6. LED P.C.Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
			(LEDS)	
	LED1	B3AFB0000211	LED	
	LED2	B3AFB0000211	LED	
			(RESISTORS)	
	R14	ERJ3GEYJ330	33	S
	R15	ERJ3GEYJ330	33	S

15.5.2. Handset

15.5.2.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	101	PNGP1305Z1	PANEL, LCD	S
	102	PNYE1106Z	TAPE, DOUBLE SIDED	
	103	PNKM1500Z1	CABINET BODY	ABS-HB
	104	L0AD01A00026	RECEIVER	
	105	PNYE1107Z	SPACER, CUSHION LCD	
	106	PNBC1483Z1	BUTTON, NAVIGATORKEY	S
	107	PNBX1358Y1	KEYBOARD SWITCH	S

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	108	PNHR1644Z	SPACER	
	109	PNJK1200Z	RUBBER SWITCH	
	110	PNHR1757Z	GUIDE, SPEAKER	
	111	PQH610729Z	RUBBER PARTS	
	112	L0AA02A00120	SPEAKER	
	113	PNHS1502Z	SPACER, SPEAKER NET	
	114	PNKE1269Z1	COVER, EP CAP	S
	115	PNJC1018Z	BATTERY TERMINAL	
	116	PNKF1271Z1	CABINET COVER	ABS-HB
	117	PNQT2006Z	LABEL, ATTENTION	S
	118	PNGT7682Z	NAME PLATE	S
	119	PNQT2759Z	LABEL, BATTERY	S
	120	PNKK1076Z1	LID, BATTERY	S
	121	PNHS1466Z	CUSHION, BATTERY COVER	
	122	PNYNTGA680BR	LID, BATTERY ASS'Y	S

15.5.2.2. Main P.C.Board Parts

Note:

(*1) When replacing IC4, IC3 or X1, data needs to be written to them with PNZZTG9581B. Refer to Handset (P.67) of **Things to Do after Replacing IC or X'tal** (P.62).

(*2) When replacing the portable LCD, See **How to Replace the Handset LCD** (P.55).

(*3) When replacing IC3, refer to **How to Replace the LLP (Leadless Leadframe Package) IC** (P.72).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB100	PNWPTGA950BR	MAIN P.C.BOARD ASS'Y (RTL) (Ics)	
	IC1	C1CB00003837	IC	
	IC3	PNWITGA950BR	IC(*1)(*3)	
	IC4	C3FBLV000150	IC(*1) (TRANSISTORS)	
	Q1	B1ADGE000012	TRANSISTOR(SI)	
	Q2	B1ADCF000040	TRANSISTOR(SI)	
	Q3	B1ABGE000011	TRANSISTOR(SI)	
	Q4	B1ADCF000040	TRANSISTOR(SI)	
	Q6	2SC6054JSL	TRANSISTOR(SI)	
	Q9	B1GBCFGA0021	TRANSISTOR(SI)	
	Q13	2SC6054JSL	TRANSISTOR(SI)	S
			(DIODES)	
	D3	B0JCDD000001	DIODE(SI)	
	D4	DZ2J033M0L	DIODE(SI)	
	D5	DZ2J033M0L	DIODE(SI)	
			(LEDS)	
	LED1	B3ACB0000216	DIODE(SI)	
	LED2	B3ACB0000216	DIODE(SI)	
	LED20	B3AFB0000370	DIODE(SI)	
	LED3	B3ACB0000216	DIODE(SI)	
	LED4	B3ACB0000216	DIODE(SI)	
	LED5	B3ACB0000216	DIODE(SI)	
	LED6	B3ACB0000216	DIODE(SI)	
	LED7	B3ACB0000216	DIODE(SI)	
	LED8	B3ACB0000216	DIODE(SI)	
			(JACK)	
	CN1	K2HD103D0001	JACK/SOCKET (RESISTORS)	
	R1	D0GA103JA021	10k	
	R2	D0GA303JA021	30k	
	R6	D0GA103JA021	10k	
	R7	D0GA821JA021	820	
	R8	ERJ8GEYJ4R3V	4.3	S
	R9	D0GA303JA021	30k	
	R15	D0GA152JA021	1.5k	
	R18	D0GA303JA021	30k	
	R19	D0GA103JA021	10k	
	R20	D0GA563ZA006	56k	
	R23	D0GA102JA021	1k	
	R45	D0GBR10JA113	0.1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R48	ERJ2GEYJ391	390	S
	R61	D0GA102JA021	1k	
	R76	D0GA1R0JA014	1	
	R77	D0GA1R0JA014	1	
	R101	D0GA100JA021	10	
	R103	D0GA222JA021	2.2k	
	R104	D0GA104JA021	100k	
	R105	D0GA473JA021	47k	
	R108	D0GA104JA021	100k	
	RA1	D1H810240004	COMPONENTS PARTS	S
	RA2	D1H810240004	COMPONENTS PARTS	S
	RA5	EXB28V332JX	COMPONENTS PARTS	
	RA7	EXB24V821JX	COMPONENTS PARTS	
			(CAPACITORS)	
	C1	EEE0JA221WP	220	S
	C5	ECUV1C104KBV	0.1	S
	C6	ECUV1C104KBV	0.1	S
	C11	ECUE1A104KBQ	0.1	S
	C12	ECUV0J225KBV	2.2	S
	C13	ECUE1A104KBQ	0.1	S
	C19	ECUE1H102KBQ	0.001	S
	C22	ECUE0J105KBQ	1	S
	C29	ECUE0J105KBQ	1	S
	C30	ECUV1C105KBV	1	S
	C32	ECUE1A104KBQ	0.1	S
	C36	ECUE1H390JCQ	39p	S
	C37	ECUE1H390JCQ	39p	S
	C40	ECUE1A104KBQ	0.1	S
	C41	ECUE1A104KBQ	0.1	S
	C43	ECUE1H100DCQ	10p	S
	C44	ECUE1A104KBQ	0.1	S
	C45	ECUE1A104KBQ	0.1	S
	C46	ECUE1H100DCQ	10p	S
	C47	ECUE0J105KBQ	1	S
	C51	ECUE0J105KBQ	1	S
	C52	ECUE0J105KBQ	1	S
	C53	ECUV1A225KBV	2.2	S
	C55	ECUE1H100DCQ	10p	S
	C56	ECUE0J105KBQ	1	S
	C59	ECUE0J105KBQ	1	S
	C69	ECUE1A104KBQ	0.1	S
	C70	ECUE1H101JCQ	100p	S
	C71	ECUE1H101JCQ	100p	S
	C72	ECUE1H101JCQ	100p	S
	C73	ECUE1H101JCQ	100p	S
	C74	PQCUV0J106KB	10	S
	C78	ECUE1H222KBQ	0.0022	S
	C79	ECUE1H222KBQ	0.0022	S
	C91	ECUV1C105KBV	1	S
	C92	ECUE0J105KBQ	1	S
	C93	ECUE0J105KBQ	1	S
	C104	ECUE1H102KBQ	0.001	S
	C105	ECUE1H102KBQ	0.001	S
	C106	ECUE1A104KBQ	0.1	S
	C190	ECUE1A104KBQ	0.1	S
	C191	ECUE0J105KBQ	1	S
	C801	ECUV1H100DCV	10p	S
	C859	ECUE1H100DCQ	10p	S
	C860	F1G1H2R2A765	2.2p	
	C861	F1G1H2R2A765	2.2p	
	C862	F1G1H1R2A765	1.2	
	C866	ECUE1A104KBQ	0.1	S
			(OTHERS)	
	MIC100	L0CBAY000053	BUILTIN-MICROPHONE	
	E101	L5DYBY00001	LIQUID CRYSTAL DISPLAY	
	E102	PNHR1756Z	GLASS/TRANSPARENT PLATE	
	E103	PNHR1755Z	GUIDE	
	E104	PNVE1011Z	BATTERY TERMINAL	
	E105	PQH610729Z	SPACER	
	E106	PNJT1140Z	CHARGE TERMINAL (R)	
	E107	PNJT1141Z	CHARGE TERMINAL (L)	
▲	F1	K5H252Y00002	FUSE	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	X1	H0J103500038	CRYSTAL OSCILLATOR(*1)	

15.5.3. Charger Unit

15.5.3.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	200	PNLC1040ZB	CHARGER UNIT ASS'Y with NAME PLATE (RTL)	
	200-1	PNKM1477Z1	CABINET BODY	PS-HB
	200-2	PNJT1146Z	CHARGE TERMINAL	
	200-3	PNKF1279Z1	CABINET COVER	PS-HB
	200-4	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	
▲	200-5	PNLV233AZ	AC ADAPTOR	
	201	PNYENLC1040Y	NAME PLATE	

15.5.4. Accessories and Packing Materials

Note:

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

15.5.4.1. KX-TG9581B

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
▲	A1	PNLV226Z	AC ADAPTOR	
	A2	PQJA10075Y	CORD, TELEPHONE(2-wire)	
	A3	PQJA10088Y	CORD, TELEPHONE(4-wire)	
	A4	PQJA10166Z	CORD, USB	
	A5	PQJA212V	CORD, HANDSET	
	A6	PNLXP1005Y	HANDSET	
	A7	PNKE1268Z1	HANGER, BELT CLIP	
	A8	PNQX6371Z	INSTRUCTION BOOK(*1)	
	A9	PNQW3426Z	LEAFLET, MINI-LOCATOR	
	A10	PNQW2611Z	LEAFLET, REPEATER	
	A11	PNQW3883Z	LEAFLET, QUICK GUIDE	
	A12	PNJX1051Z	CD-ROM	
	P1	PNPK3867001Z	GIFT BOX	
	P2	PNPD1908Z	CUSHION	

15.5.4.2. KX-TG9582B

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
▲	A101	PNLV226Z	AC ADAPTOR	
	A102	PQJA10075Y	CORD, TELEPHONE(2-wire)	
	A103	PQJA10088Y	CORD, TELEPHONE(4-wire)	
	A104	PQJA10166Z	CORD, USB	
	A105	PQJA212V	CORD, HANDSET	
	A106	PNLXP1005Y	HANDSET	
	A107	PNKE1268Z1	HANGER, BELT CLIP	
	A108	PNQX6371Z	INSTRUCTION BOOK(*1)	
	A109	PNQW3426Z	LEAFLET, MINI-LOCATOR	
	A110	PNQW2611Z	LEAFLET, REPEATER	
	A111	PNQW3883Z	LEAFLET, QUICK GUIDE	
	A112	PNJX1051Z	CD-ROM	
	P101	PNPK3868001Z	GIFT BOX	
	P102	PNPD1909Z	CUSHION	

15.5.4.3. KX-TGA950B

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	A201	PNQX6077Y	INSTRUCTION BOOK (*1)	
	A202	PNKE1268Z1	HANGER, BELT CLIP	
	P201	PNPK3664008Y	GIFT BOX	
	P202	PNPD1715Z	CUSHION	

15.5.5. Screws

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	A	XTB26+8GFJ	TAPPING SCREW	
	B	XTB2+8GFJ	TAPPING SCREW	

15.5.6. Fixtures and Tools

Note:

(*1) See **Equipment Required** (P.56), and **The Setting Method of JIG (Handset)** (P.59).

(*2) When replacing the Base unit and Portable LCD, See **Assembly Instructions** (P.53).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
		PQZZ1CD300E	JIG CABLE (*1)	
		PNZZTG9581B	BATCH FILE CD-ROM (*1)	
		PQZZ430PIR	TIP OF SOLDERING IRON (*2)	
		PQZZ430PRB	RUBBER OF SOLDERING IRON (*2)	