

Service Manual

Telephone Equipment

Model No. **KX-TGF380AGM**

KX-TGFA30AGM

Digital Corded/Cordless Phone with
Link-to-Cell

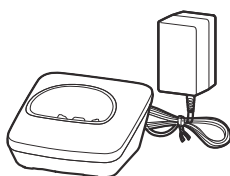
M: Metallic Black Version
(for Argentina)



KX-TGFA30
(Handset)



KX-TGF380
(Base Unit)



(Charger Unit)

Configuration for each model

Model No	Base Unit	Handset	Charger Unit
KX-TGF380	1 (TGF380)	1 (TGFA30)	1

 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.

2.2. About Lead Free Solder (PbF: Pb free)

Note:

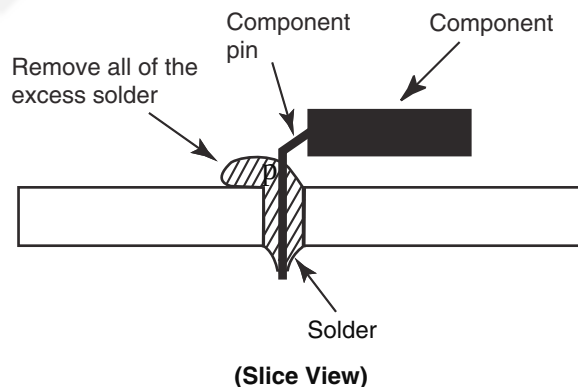
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

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

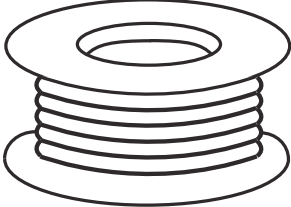
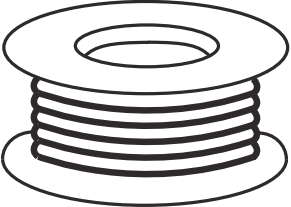
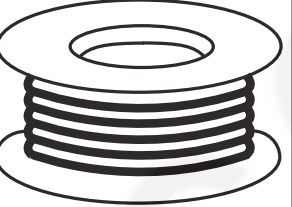
- PbF solder has a melting point that is 50 °F ~ 70 °F (30 °C ~ 40 °C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700 °F ± 20 °F (370 °C ± 10 °C).
- Exercise care while using higher temperature soldering irons.:
 Do not heat the PCB for too long time 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
- **Frequency range:**
 - 1.91 GHz to 1.93 GHz (DECT)
 - 2.402 GHz to 2.48 GHz (Bluetooth)
- **RF transmission power:**
 - 115 mW (max)
- **Power source:**
 - 220 - 240 V AC, 50/60 Hz
- **Power consumption:**
 - Base unit :**
 - Standby: Approx. 0.8 W
 - Maximum: Approx. 3.0 W
 - Charger :**
 - Standby: Approx. 0.1 W
 - Maximum: Approx. 1.8 W
- **Operating conditions:**
 - 0°C - 40°C, 20 % - 80 % relative air humidity (dry)
- **Dimensions (W x D x H):**
 - Base unit: Approx. 222 mm x 163 mm x 103 mm
 - Handset: Approx. 48 mm x 30 mm x 168 mm
 - Charger unit: Approx. 72 mm x 73 mm x 39 mm
- **Mass (Weight):**
 - Base unit: Approx. 580 g
 - Handset: Approx. 140 g
 - Charger: 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.

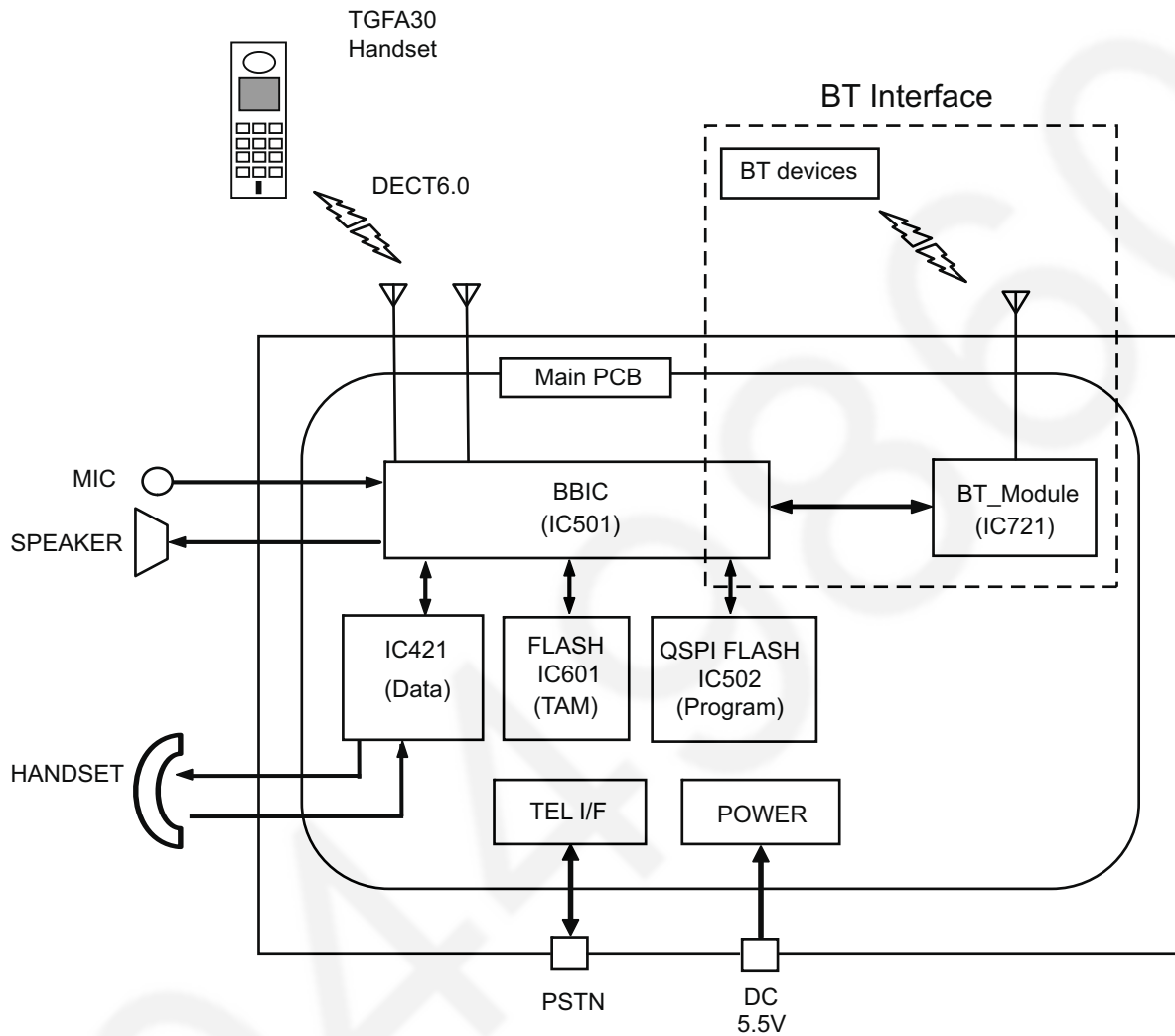
4 Technical Descriptions

4.1. Circuit Configuration of TGF38x Series Phones

TGF38x Series consists of DECT cordless telephone and Bluetooth Module.

Both voices of transmission and reception are transferred by PCM.

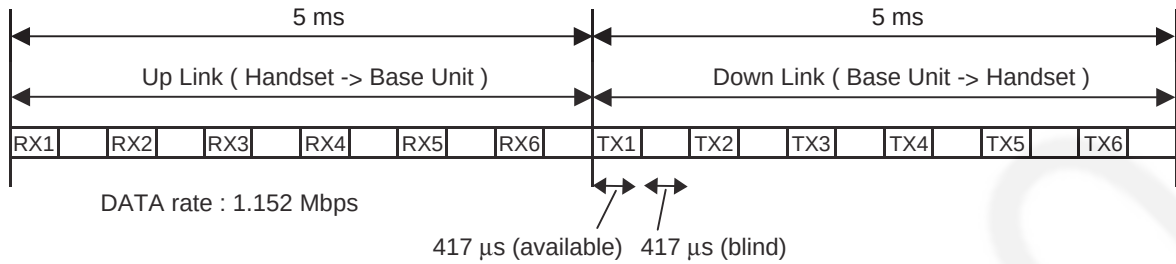
BBIC on DECT side controls the cordless telephone system, which makes control data communication with BT_IC on BT Module in serial data.



4.2. US-DECT Description

Transmitting and receiving carrier between base unit and handset is same frequency.

4.2.1. TDD Frame Format

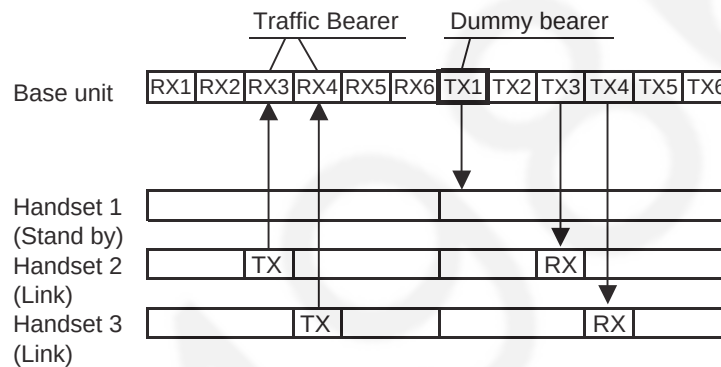


4.2.2. TDMA system

This system is the cycles of 10 ms, and has 6 duplex paths, but maximum duplex communication path is 5 because of dummy bearer use.

In 1 slot 417 μ s, the 10 ms of voice data is transmitted.

• 2 - Handsets Link



Traffic Bearer

A link is established between base unit and handset.

The state where duplex communication is performed.

Handset doesn't make up duplex in no free RF channels because of interference. (*1)

Dummy Bearer

Base unit sends Dummy-data to the all stand-by state handsets.

Handsets receive that data for synchronization and monitoring request from the base unit.

Base unit doesn't send Dummy bearer in no free RF channels because of interference. (*1)

Note:

(*1) It is a feature under FCC 15 regulation and for interference avoidance.

In the case of checking RF parts, it is better in least interference condition.

4.2.3. Signal Flowchart in the Radio Parts

Reception

Base unit:

A voice signal from TEL line is encoded to digital data and converted into a 1.9GHz modulated radio signal by BBIC(IC501). The RF signal, after which is amplified in BBIC, is fed to selected antenna.

Handset:

As for a handset RF, RF signal is received in one antenna.

BBIC down-converts to 864 kHz IF signal from RX signal and demodulates it to digital data "RXDATA".

BBIC (IC1) converts RXDATA into a voice signal and outputs it to speaker.

Transmission

Handset:

A voice signal from microphone is encoded to digital data and converted into a 1.9GHz modulated radio signal by BBIC(IC1). The RF signal, after which is amplified in BBIC, is fed to an antenna.

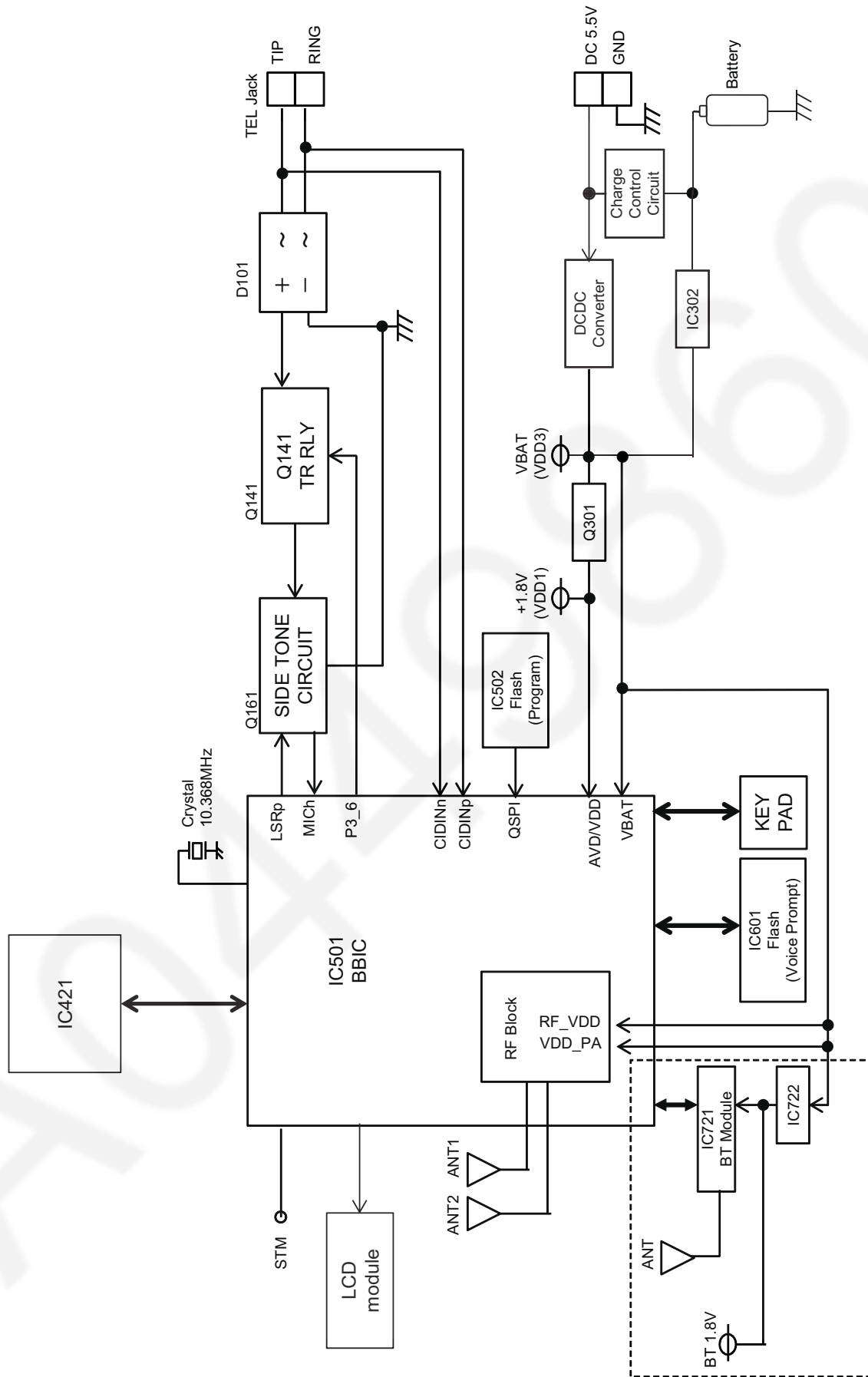
Base unit:

As for a base unit RF, RF signal is received in two antennas.

BBIC (IC501) compares RF signal levels and selects the antenna to be used. Then BBIC down-converts to 864 kHz IF signal from RX signal in the selected antenna, and demodulates it to digital data "RXDATA".

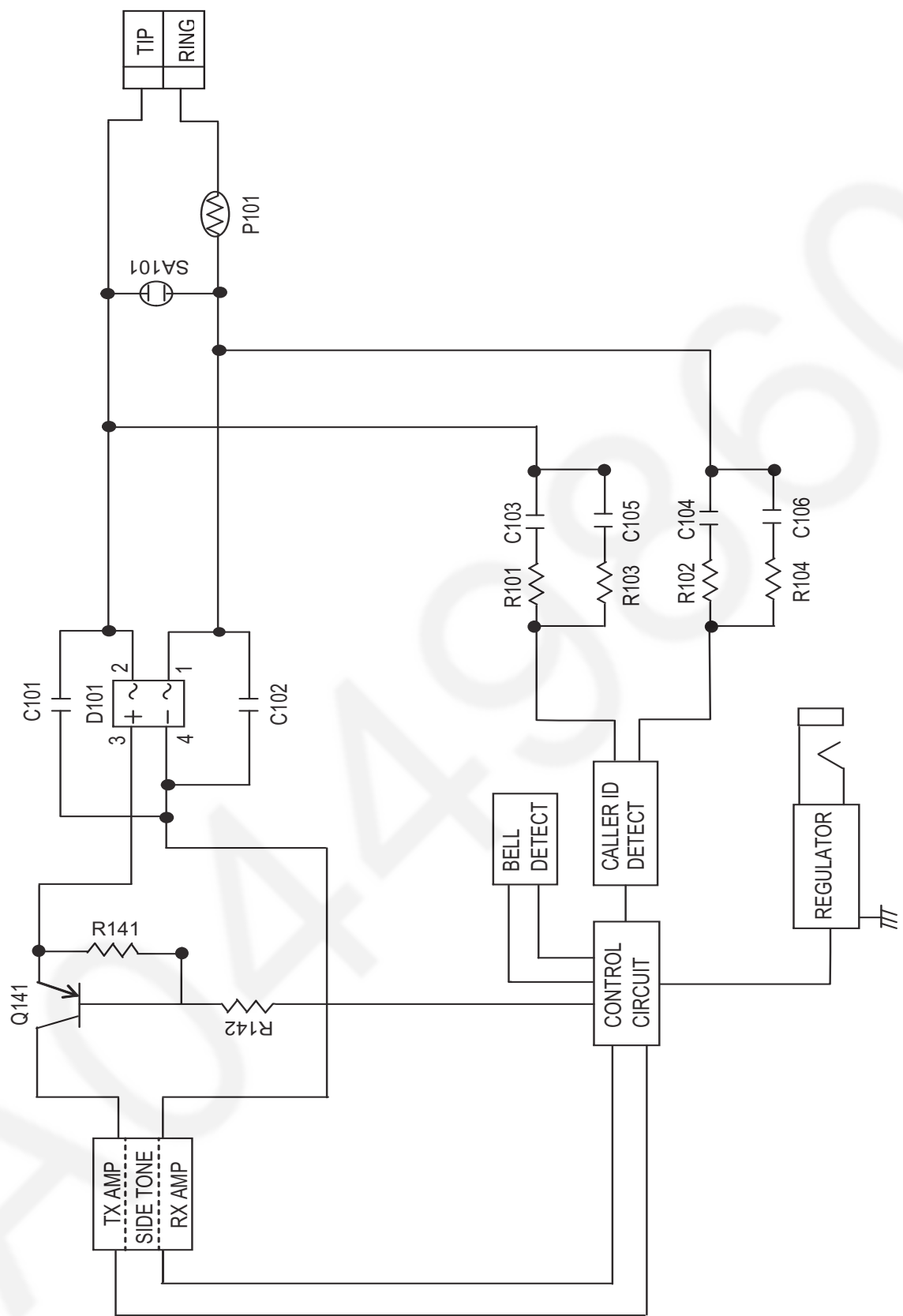
BBIC (IC501) converts RXDATA into a voice signal and outputs it to TEL line.

4.3. Block Diagram (Base Unit_Main)

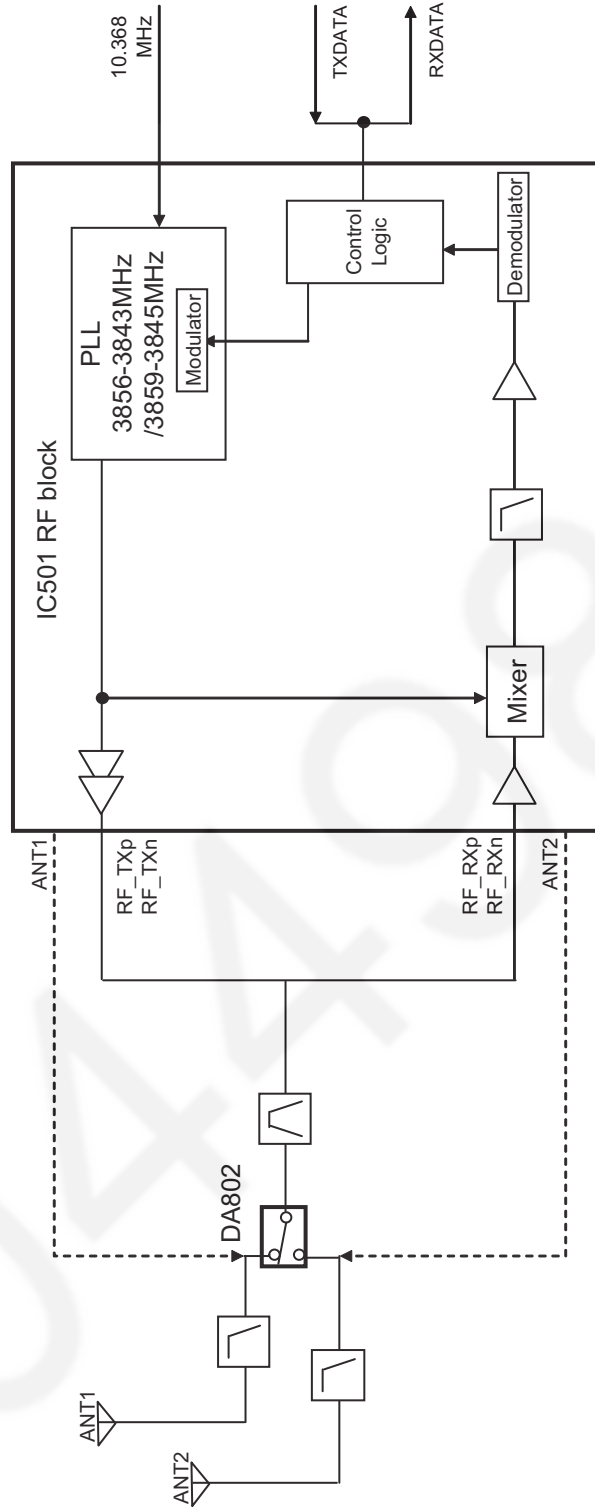


KX-TGF380AG BLOCK DIAGRAM (Base Unit_Main)

4.4. Tel Interface Circuit



4.5. Block Diagram (Base Unit_RF Part)



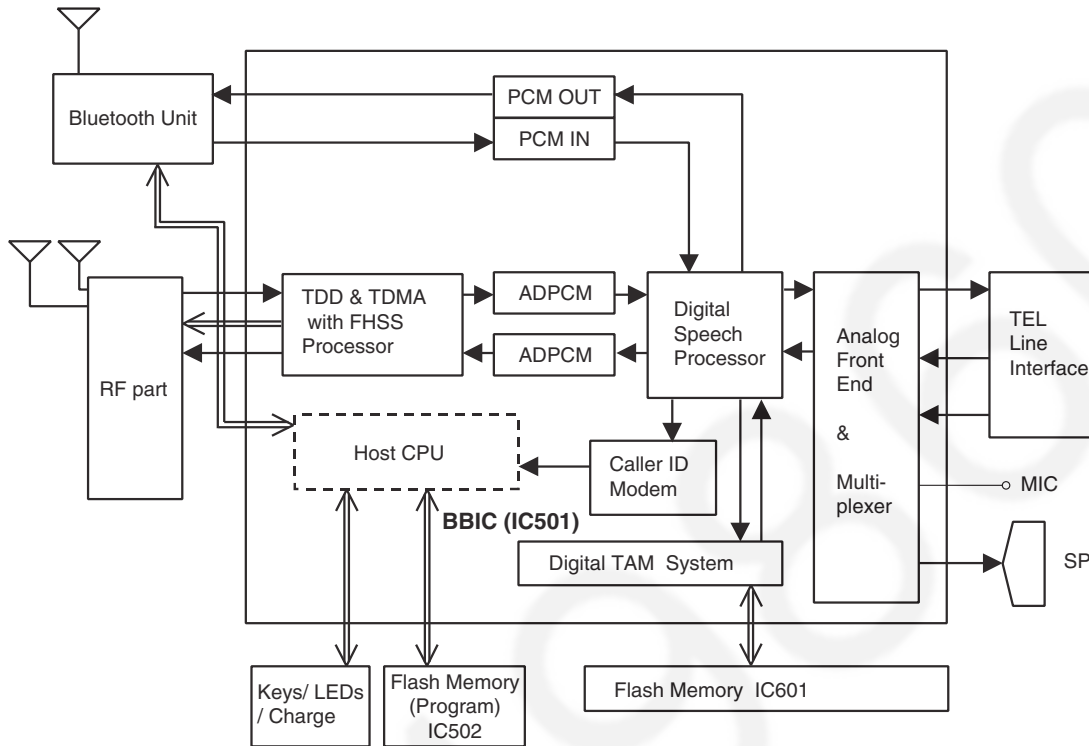
KX-TGF380AG BLOCK DIAGRAM (Base Unit_RF Part)

4.6. Circuit Operation (Base Unit)

General Description:

(BBIC, Flash Memory, EEROM) is a digital speech/signal processing system that implements all the functions of speech compression, record and playback, and memory management required in a digital telephone answering machine.

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



4.6.1. BBIC (Base Band IC: IC501)

- **Voice Message Recording/Play back**

The BBIC system uses a proprietary speech compression technique to record and store voice message in Flash Memory. An error correction algorithm is used to enable playback of these messages from the Flash Memory.

- **DTMF Generator**

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

- **Synthesized Voice (Pre-recorded message)**

The BBIC implements synthesized Voice, utilizing the built in speech detector and a Flash Memory, which stored the vocabulary.

- **Caller ID demodulation**

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

- **Digital Switching**

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

- **Block Interface Circuit**

RF part, LED, Key scan, Speaker, Telephone line.

4.6.2. Flash Memory (IC502)

Main program data is stored.

4.6.3. Flash Memory (IC601)

Following information data is stored.

- **Voice signal**

ex: Pre-recorded Greeting message, Incoming message

4.6.4. Bluetooth Unit (IC721)

Use for Bluetooth communication.

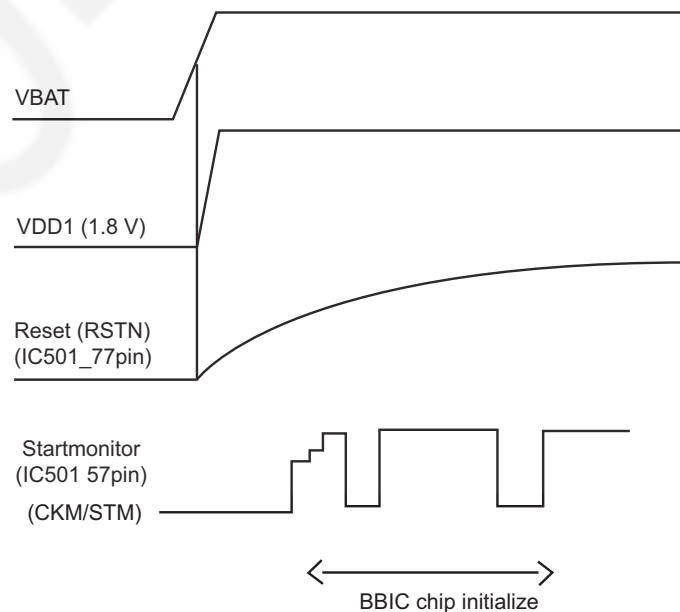
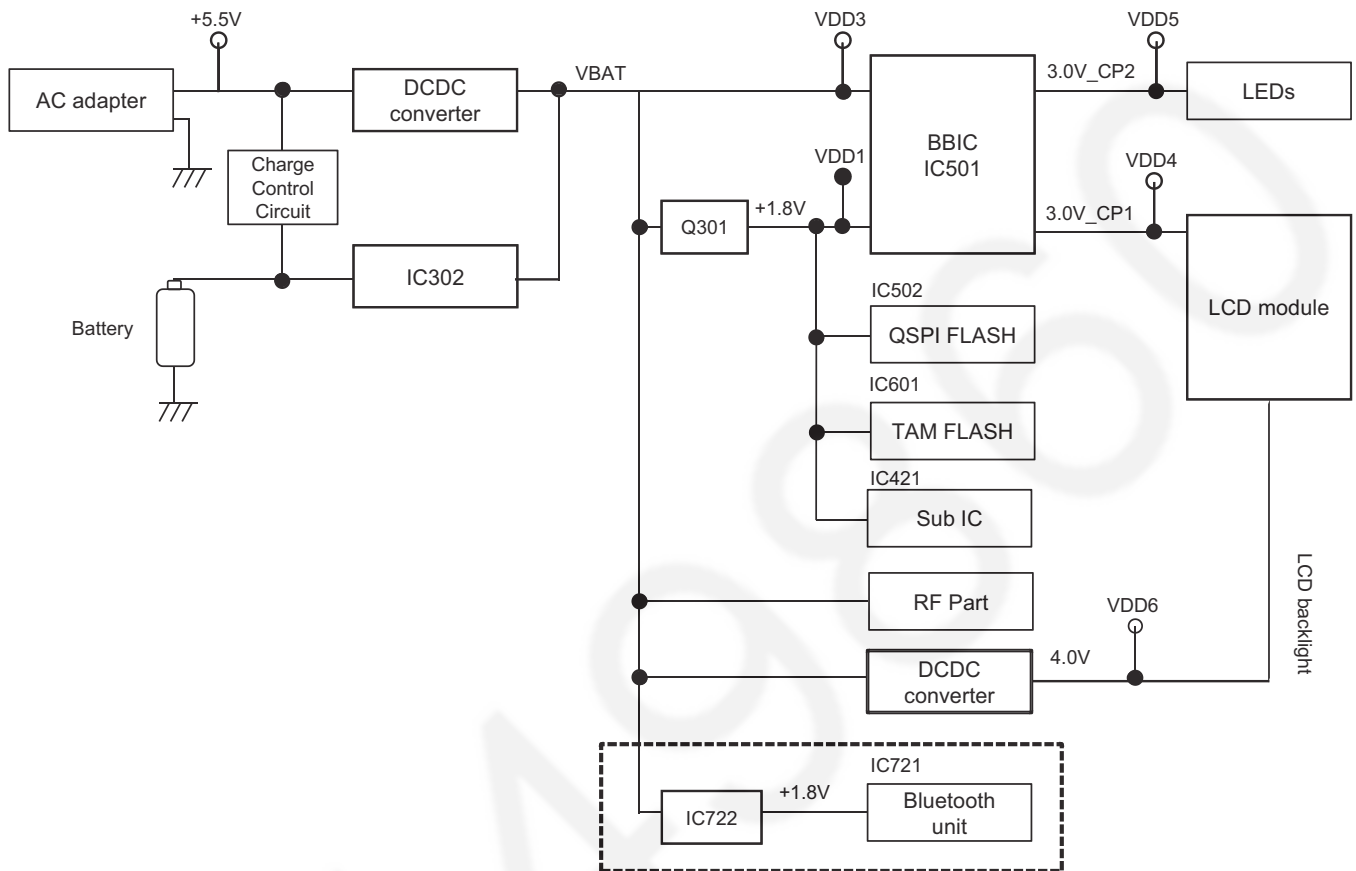
4.6.5. Power Supply Circuit/Reset Circuit

There are 2 pattern from power supply voltage.

- 1) AC adapter voltage is converted to VBAT(3.0V) at DCDC converter.
- 2) Battery voltage goes through to VBAT(Battery voltage).

VBAT is used for various voltage of the system.

Circuit Operation:



4.6.6. Telephone Line Interface

Telephone Line Interface Circuit:

Function

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

Bell (RINGING) signal detection and OFF HOOK circuit:

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

L1T → C105 → R103 → R110 → R111 → R112 → BBIC pin18 (RINGING)

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

T → D101 → Q141 → R163 → D101 → P101 → R

ON HOOK Circuit:

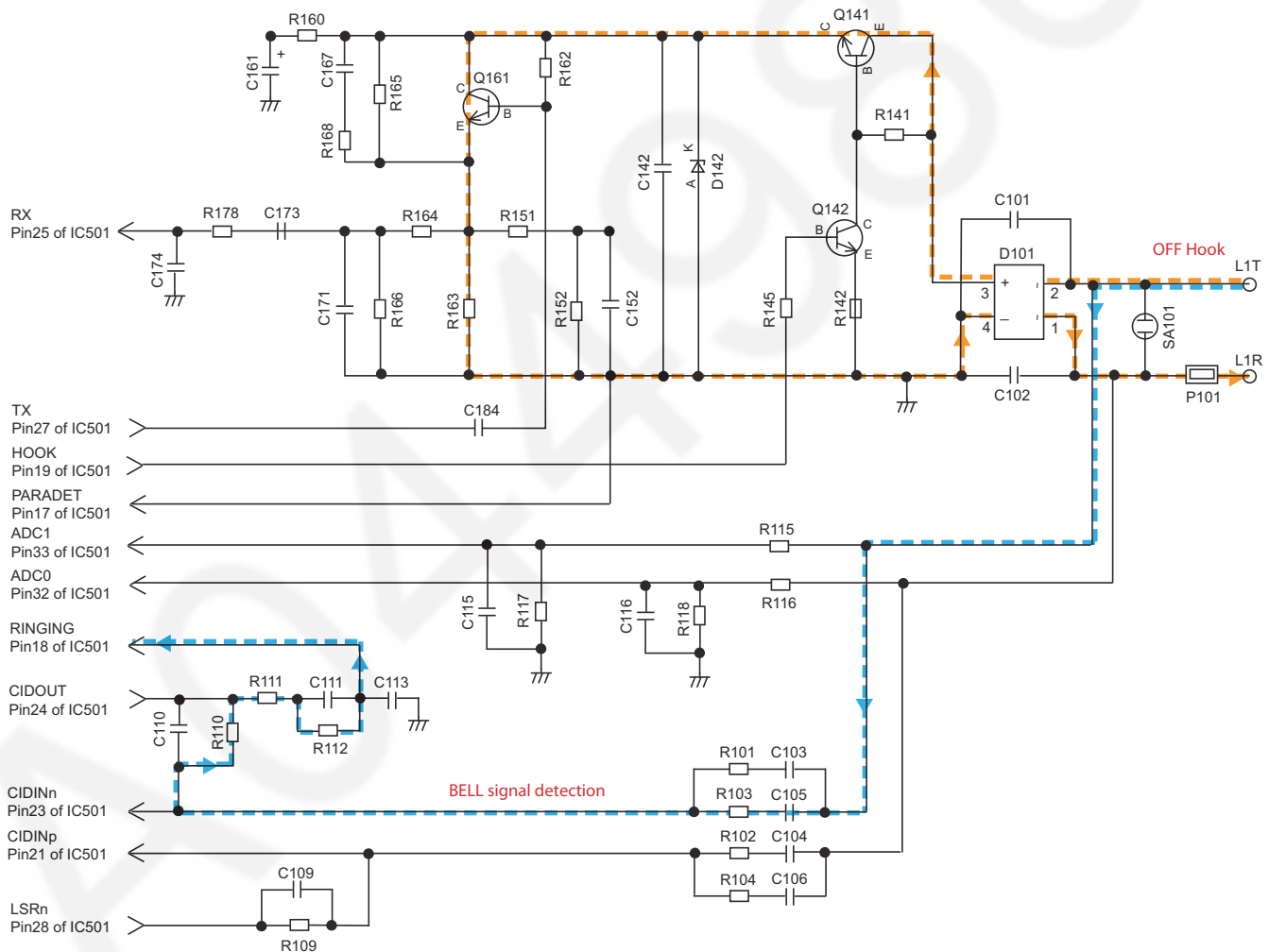
Q141 is open, Q141 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

Pulse Dial Circuit:

Pin 19 of BBIC turns Q141 ON/OFF to make the pulse dialing.

Side Tone Circuit:

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



4.6.7. Parallel Connection Detect Circuit/Auto Disconnect Circuit

Function:

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

Circuit Operation:

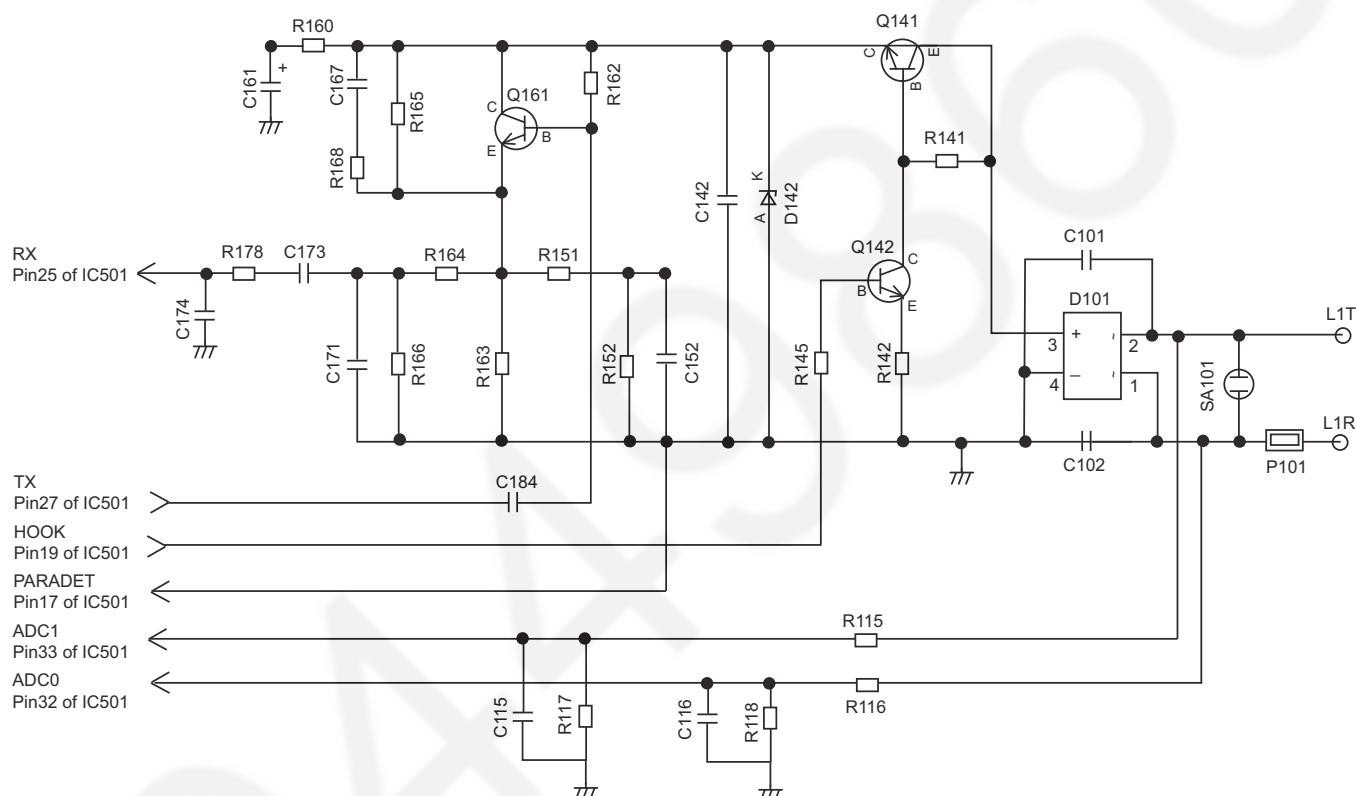
Parallel connection detection when on hook:

When on hook, the voltage is monitored at pin 32 of IC501. There is no parallel connection if the voltage is 0.54 V or higher, while a parallel connection is deemed to exist if the voltage is lower.

Parallel connection detection when off hook:

When off hook, the voltage is monitored at pin 17 of IC501; the presence/absence of a parallel connection is determined by detecting the voltage changes.

If the Auto disconnect function is ON and statuses are Hold, receiving ICM, OGM transmitting, BBIC disconnects the line after detecting parallel connection is off hook.



4.6.8. Calling Line Identification (Caller ID)/Call Waiting Caller ID

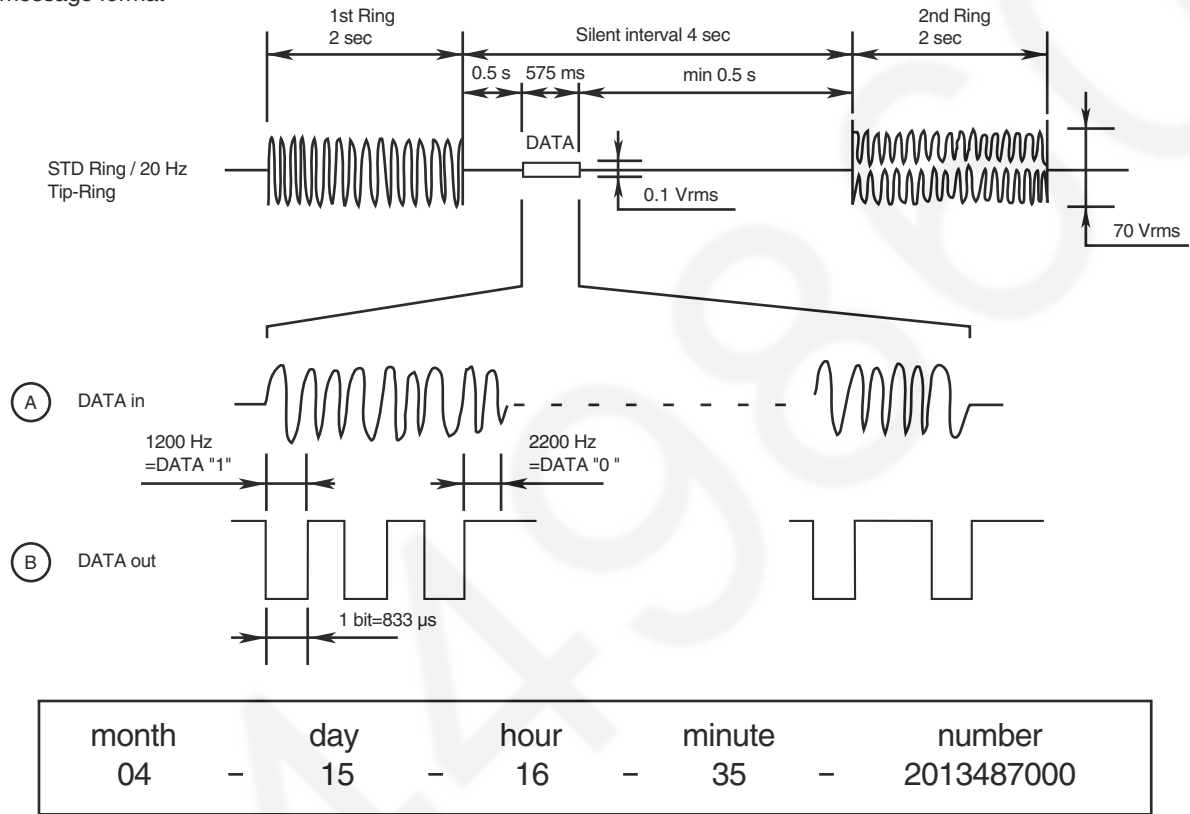
Function:

Caller ID

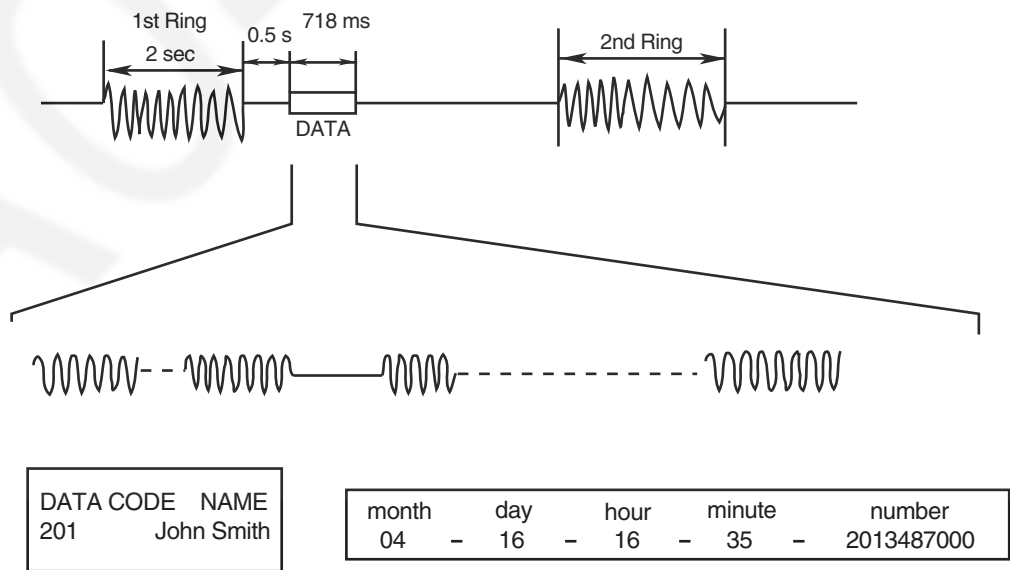
The caller ID is a chargeable ID which the user of a telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation of this circuit assumes that a caller ID service contract has been entered for the circuit being used. The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) * format. Data "1" is a 1200 Hz sine wave, and data "0" is a 2200 Hz sine wave. There are two types of the message format which can be received: i.e. the single message format and plural message format. The plural message format allows to transmit the name and data code information in addition to the time and telephone number data.

*: Also the telephone exchange service provides other formats.

● Single message format



● Plural message format



Call Waiting Caller ID

Calling Identity Delivery on Call Waiting (CIDCW) is a CLASS service that allows a customer, while off-hook on an existing call, to receive information about a calling party on a waited call. The transmission of the calling information takes place almost immediately after the customer is alerted to the new call so he/she can use this information to decide whether to take the new call.

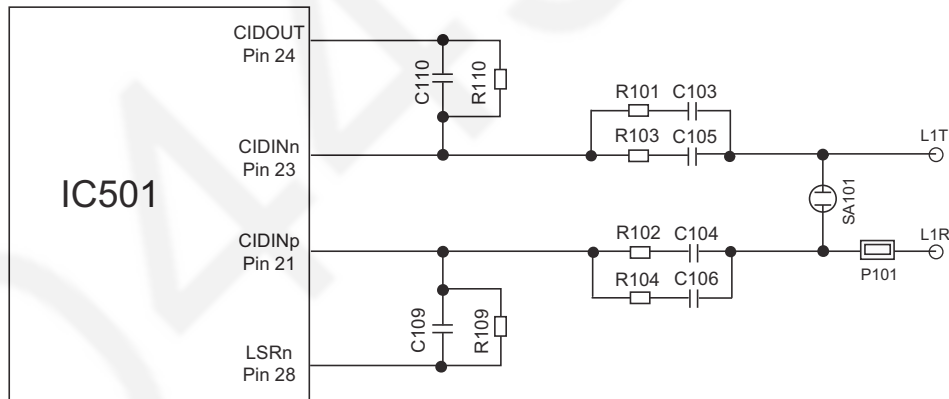
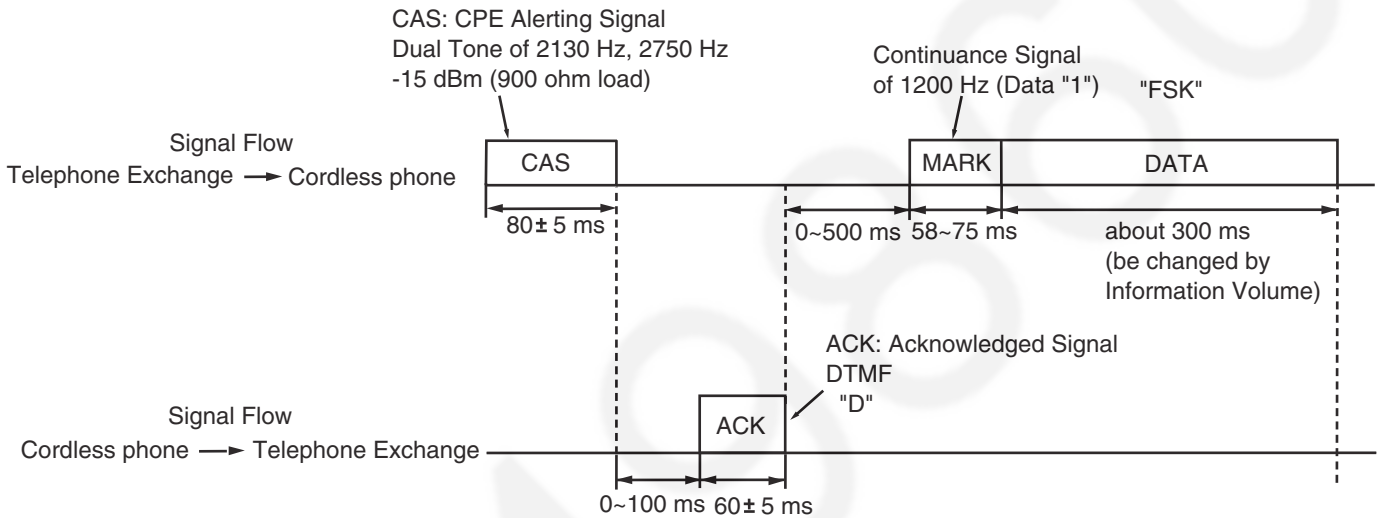
Function:

The telephone exchange transmits or receives CAS and ACK signals through each voice RX/TX route. Then FSK data and MARK data pass the following route.

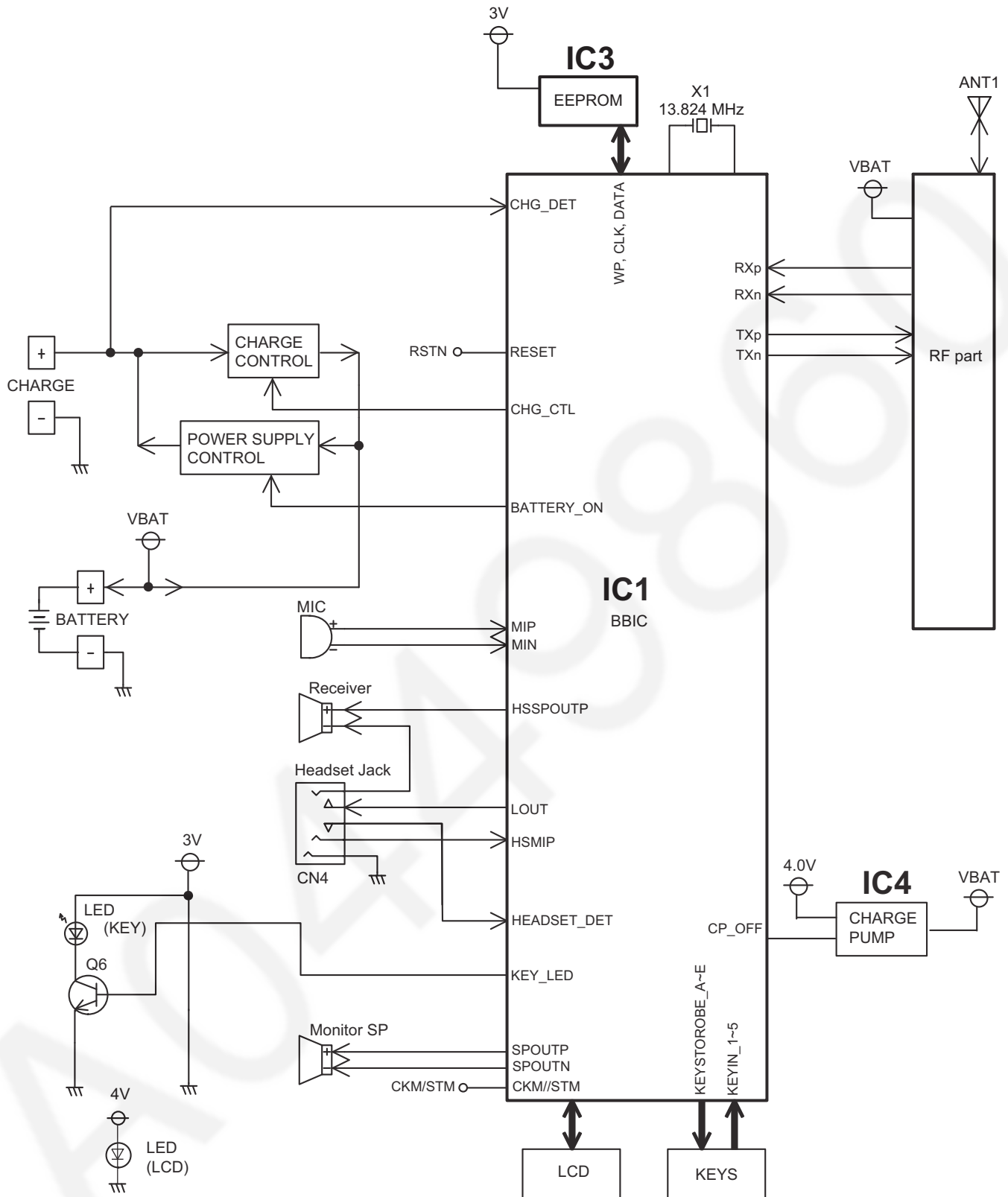
Telephone Line → P101 → C105, C104 → R103, R102 → IC501(23, 21).

If the unit deems that a telephone connected in parallel is in use, ACK is not returned even if CAS is received, and the information for the second and subsequent callers is not displayed on the portable handset display.

Call Waiting Format

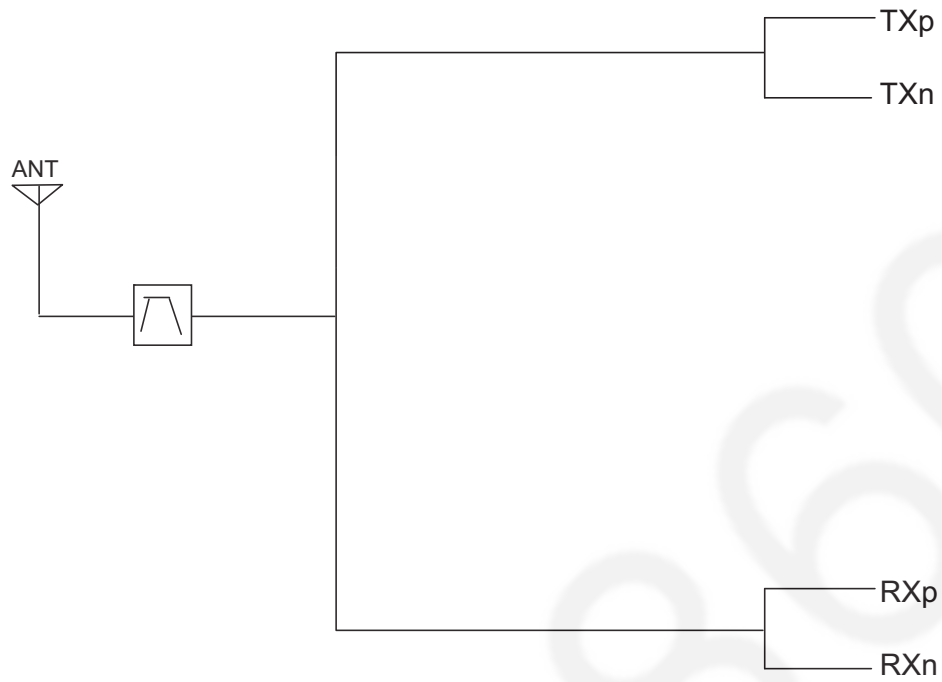


4.7. Block Diagram (Handset)



KX-TGFA30 BLOCK DIAGRAM (Handset)

4.8. Block Diagram (Handset_RF Part)



KX-TGFA30 BLOCK DIAGRAM (Handset_RF Part)

4.9. Circuit Operation (Handset)

4.9.1. Outline

Handset consists of the following ICs as shown in **Block Diagram (Handset)** (P.20).

- DECT BBIC (**B**ase **B**and IC): IC1
 - All data signals (forming/analyzing ACK or CMD signal)
 - All interfaces (ex: Key, Detector Circuit, Charge, EEPROM, LCD)
- EEPROM: IC3
 - Setting data is stored. (e.g. ID, user setting)

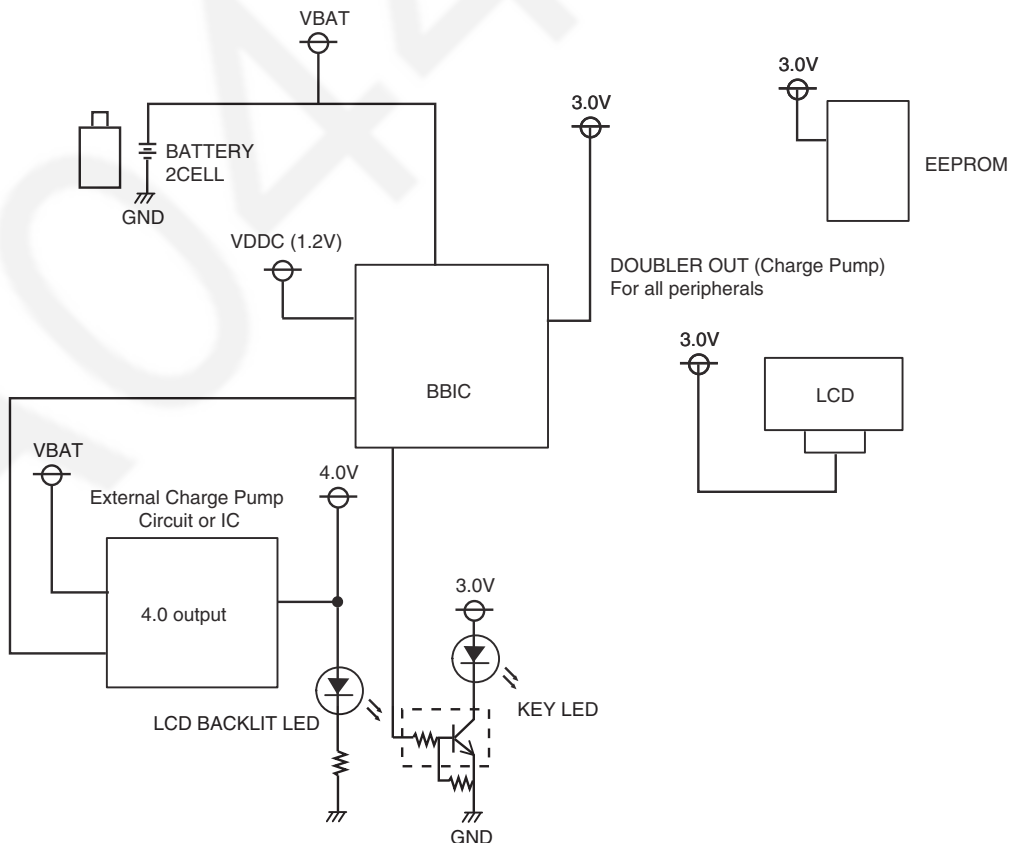
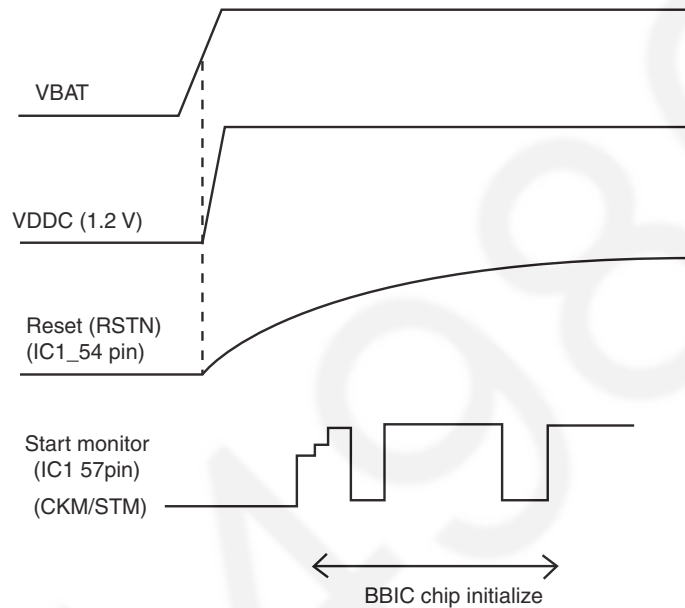
4.9.2. Power Supply Circuit/Reset Circuit

Circuit Operation:

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

BATTERY(2.2 V ~ 2.6 V: BATT+) → F1 → BBC1 (IC1) 10 pin

The Reset signal generates IC1 (54 pin) and 1.8 V.



4.9.3. Charge Circuit

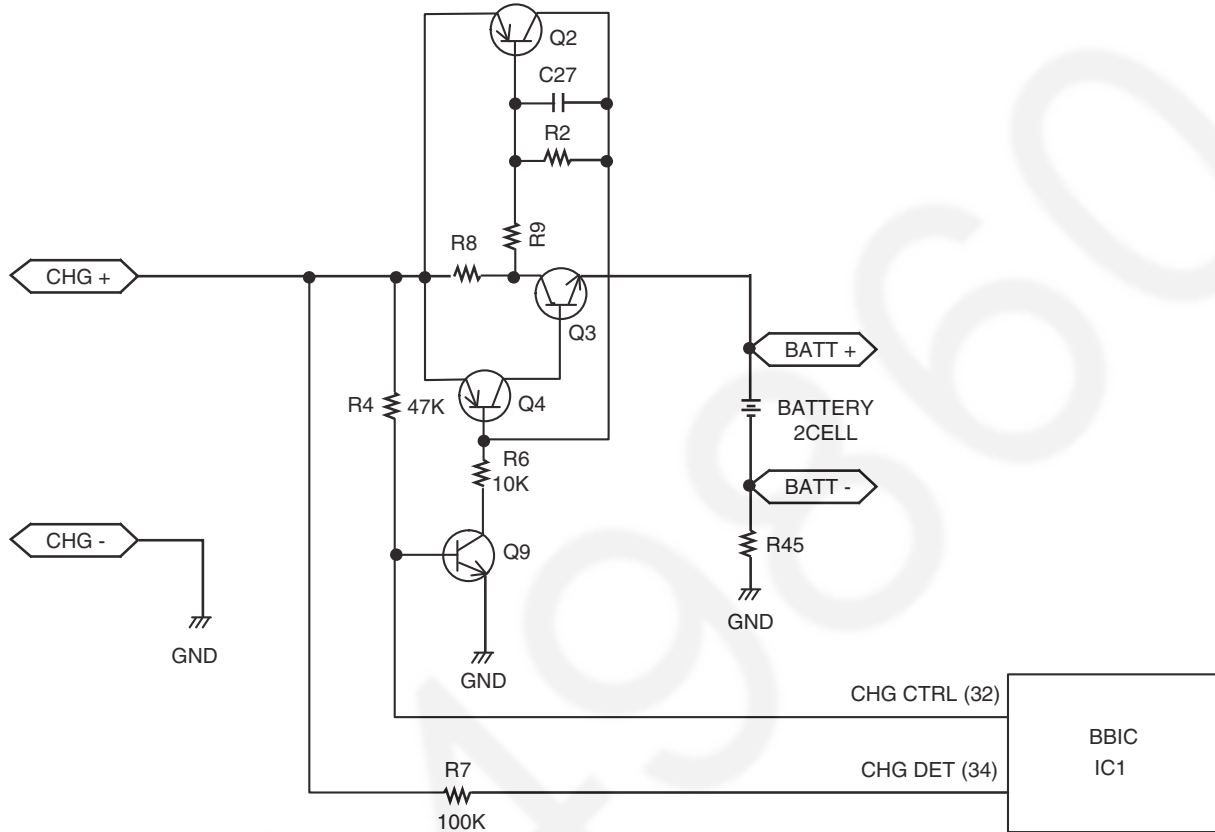
Circuit Operation:

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/Reset Circuit** (P.15).



4.9.4. 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: $V(\text{Batt}) \leq 2.35 \text{ V} \pm 50 \text{ mV}$

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

- Power Down

Battery voltage: $V(\text{Batt}) \leq 2.1 \text{ V} \pm 50 \text{ mV}$

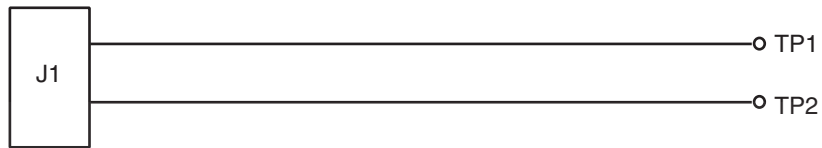
The BBIC detects this level and power down.

4.9.5. Speakerphone

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

4.10. Circuit Operation (Charger Unit)

Charge control is executed at handset side so that the operation when using charger is also controlled by handset.
Refer to **Circuit Operation (Handset)** (P.22)



AC Adaptor

The route for this is as follows: DC+pin of J1(+) → CHARGE+pad → Handset → CHARGE-pad → DC-pin of J1(-).

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.

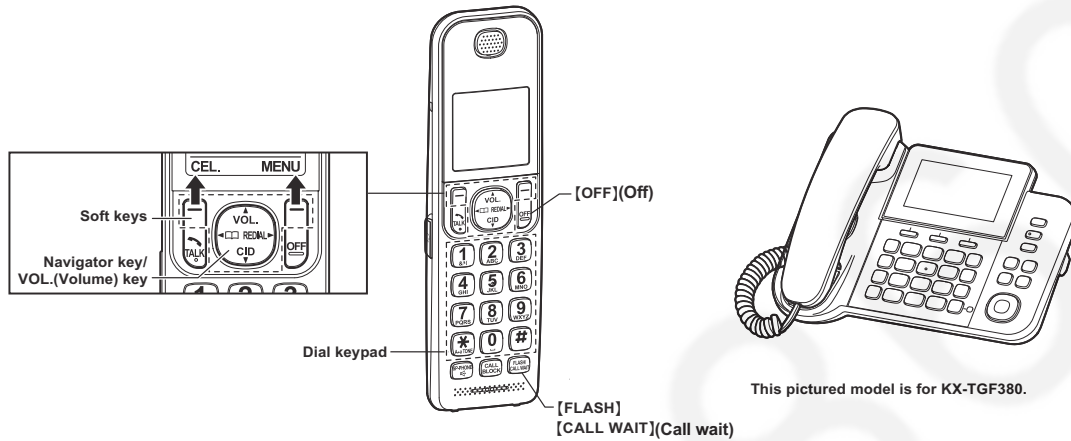
8 Test Mode

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.

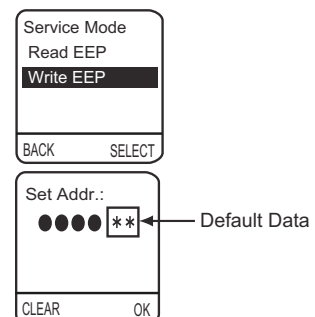


H/S key operation

H/S LCD

- 1). Press [MENU].
- 2). Select "Settings" 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.

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

Note: * To enter "Set dial mode", press **[SELECT]** or **[▶]** at " Set tel line".
It is necessary to turn on the power of base unit.

* "Set tel line" isn't displayed in Cell line only mode.

To return to normal mode, execute the following procedure:

- 1 **[MENU]** → **[#][1][5][7]**
- 2 **[▼]/[▲]**: Select "off " → **[SELECT]**
- 3 **[OFF]**

Frequently Used Items (Base Unit)

ex.)

Items	Address	Default Data	New Data		Remarks
C-ID (FSK) sensitivity	0A 58 / 0A 57	00/51	01 (6 dB up)	02 (12 dB up)	When hex changes from "00/51" to "01" or "02", gain increases by 6 dB or 12 dB.
C-ID (DTMF) sensitivity	0A 5E / 0A 5D	08/00	0B/4C (3 dB up)	0F/F6 (6 dB up)	When hex changes from "08/00" to "0B/4C" or "0F/F6", gain increases by 3 dB or 6 dB.
Frequency	00 07 / 00 08	70/02	-	-	Use these items in a READ-ONLY mode to
ID	00 02 ~ 00 06	Given value	-	-	confirm the contents. Careless rewriting may cause serious damage to the computer system.
Bell length	03 B3	3C (6 sec) (*2)	1E (3 sec)	14 (2 sec)	This is time until bell stops ringing. (Unit: 100 msec)

Note:

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

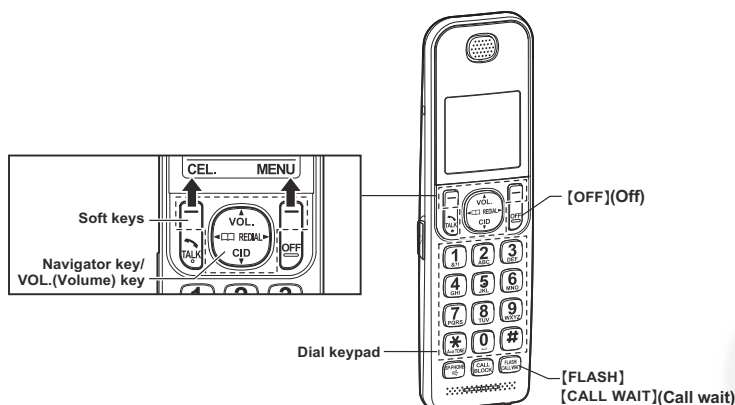
Desired Number (hex)	Input Keys	Desired Number (hex)	Input Keys
0	0	A	[Flash] + 0
1	1	B	[Flash] + 1
.	.	C	[Flash] + 2
.	.	D	[Flash] + 3
.	.	E	[Flash] + 4
9	9	F	[Flash] + 5

(*2)

Bell length	3C (hex) = 60 (dec) → 60 × 100 msec = 6000 msec (6 sec)
-------------	---

Important:

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



H/S key operation

H/S LCD

- 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 "0", "0", "0", "0" (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.

Set Addr.:

●●●● ** ← Default Data

CLEAR OK

Set Addr.:

●●●● ** ← New Data

CLEAR OK

Set Addr.:

BACK

After that, remove and reinsert the batteries. Press the Power button for about 1 second if the power is not turned on.

Frequently Used Items (Handset)

ex.)

Items	Address	Default Data	New Data	Possible Adjusted Value MAX (hex)	Possible Adjusted Value MIN (hex)	Remarks
Battery Low	00 09	95	-	-	-	(*2)
Frequency	00 07 / 00 08	00 / 01	-	-	-	
ID	00 02 ~ 00 06	Given value	-	-	-	

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

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

9 Service Mode

9.1. How to Clear User Setting (Handset Only)

Handset

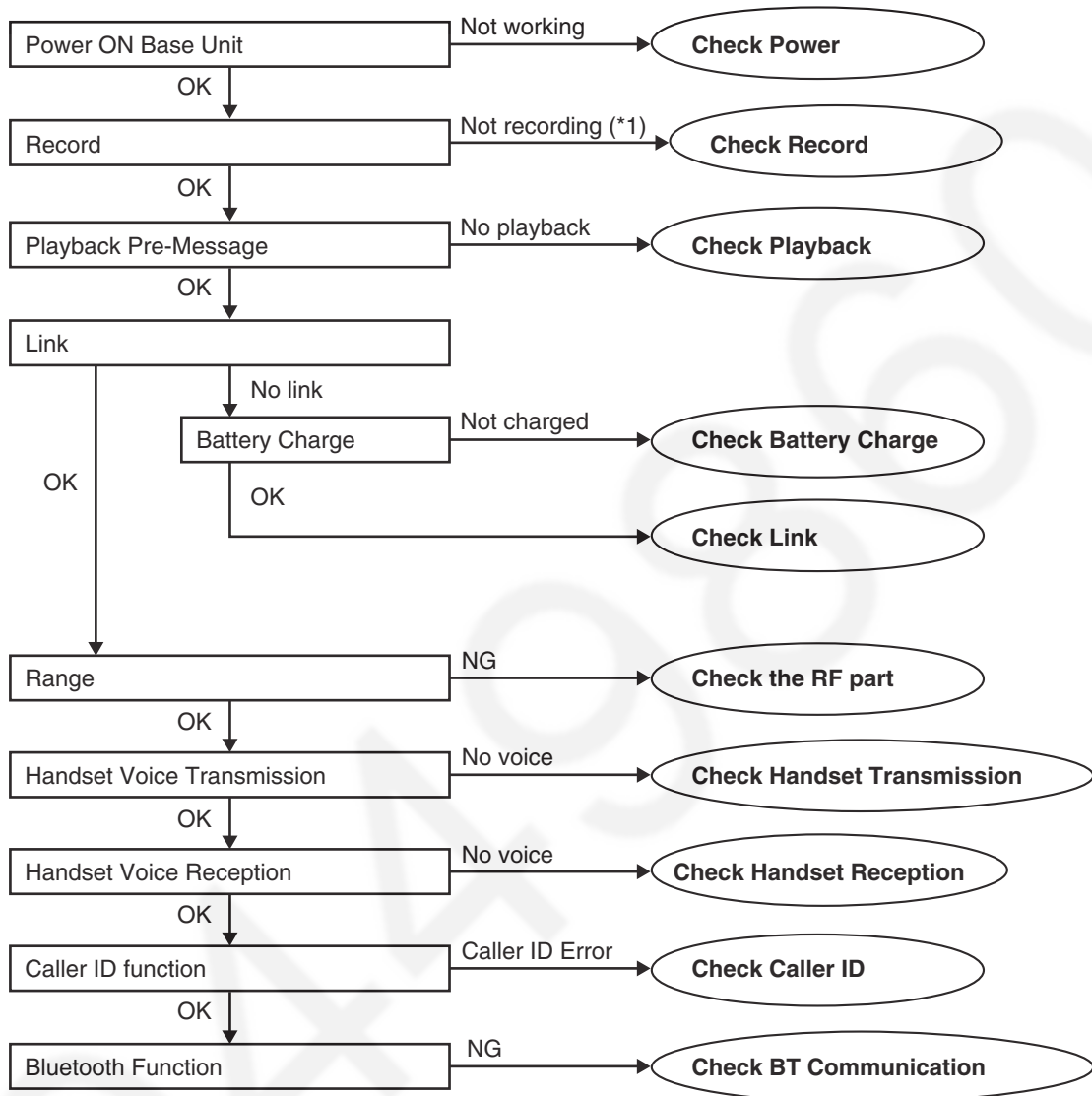
Press **[2]**, **[5]**, **[8]**, **[0]** simultaneously until a beep sound is heard. Then single handset is initialized.
(The contents of user setting are reset to factory default)

*Usage time is not cleared.

10 Troubleshooting Guide

10.1. Troubleshooting Flowchart

FLOW CHART



Cross Reference:

Check Power (P.32)

Check Record (P.33)

Check Playback (P.36)

Check Battery Charge (P.36)

Check Link (P.37)

Check the RF part (P.39)

Check Handset Transmission (P.44)

Check Handset Reception (P.44)

Check Caller ID (P.44)

Check BT Communication (P.45)

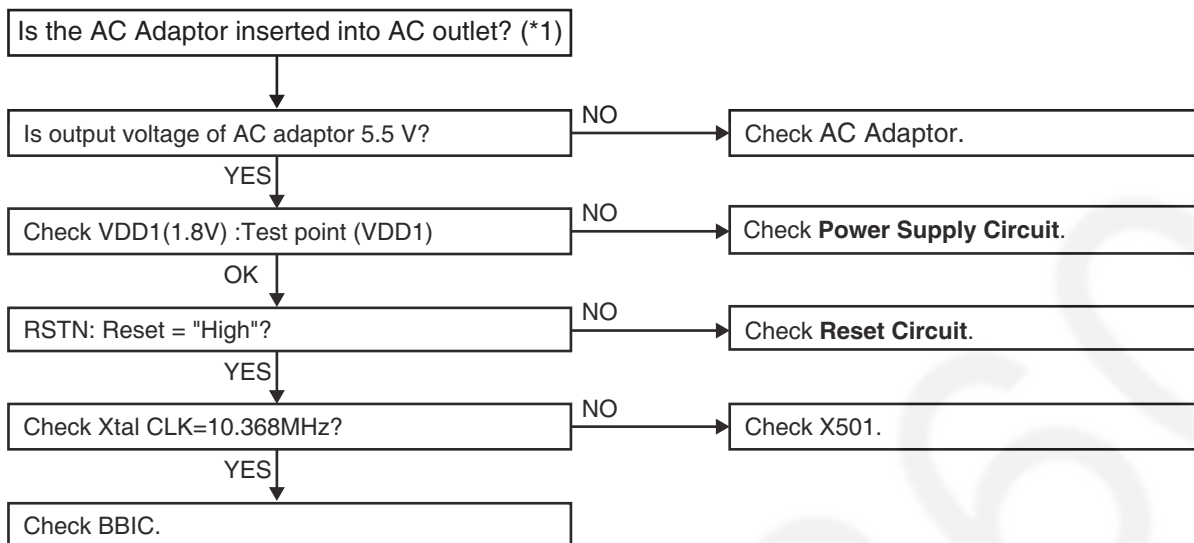
Note:

(*1) When a user claims that the unit disconnects a call right after the greeting message and no incoming messages can be recorded, this symptom can not reappear with TEL simulator in the service center. In this case, try to change the Auto disconnect activation time and Vox level.

<How to change the Auto Disconnect activation time and VOX level> (P.34) item (A) and (B).

10.1.1. Check Power

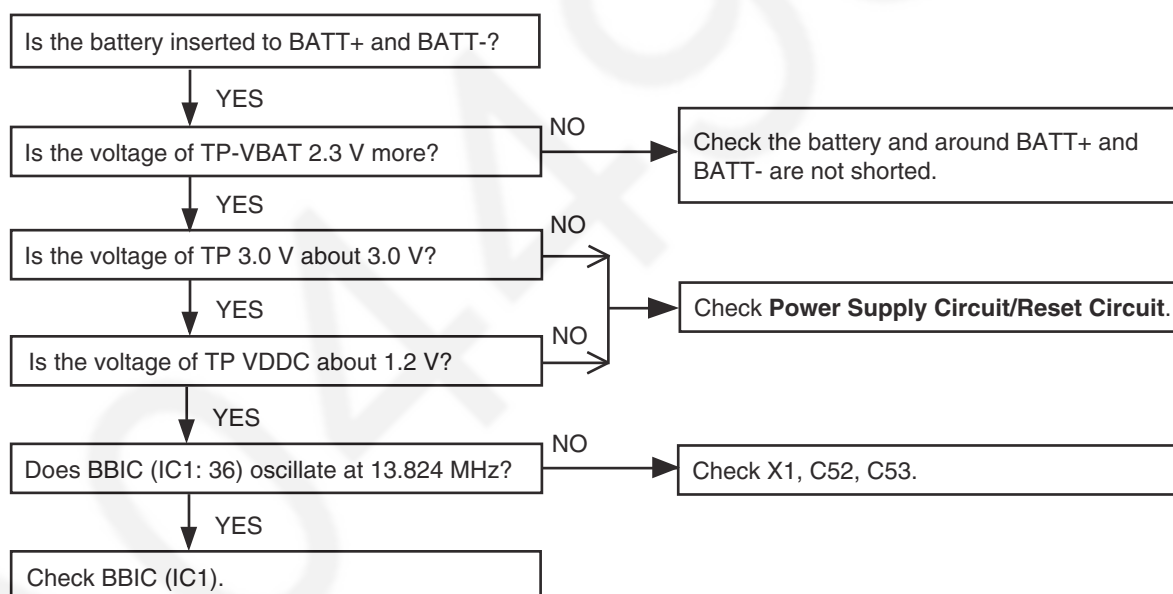
10.1.1.1. Base Unit



Cross Reference:
Power Supply Circuit/Reset Circuit (P.15)

Note:
BBIC is IC501.
(*1) Refer to **Specifications** (P.7) for part number and supply voltage of AC adaptor.
(*2) Refer to **Circuit Board (Base Unit_Main)** (P.87).

10.1.1.2. Handset

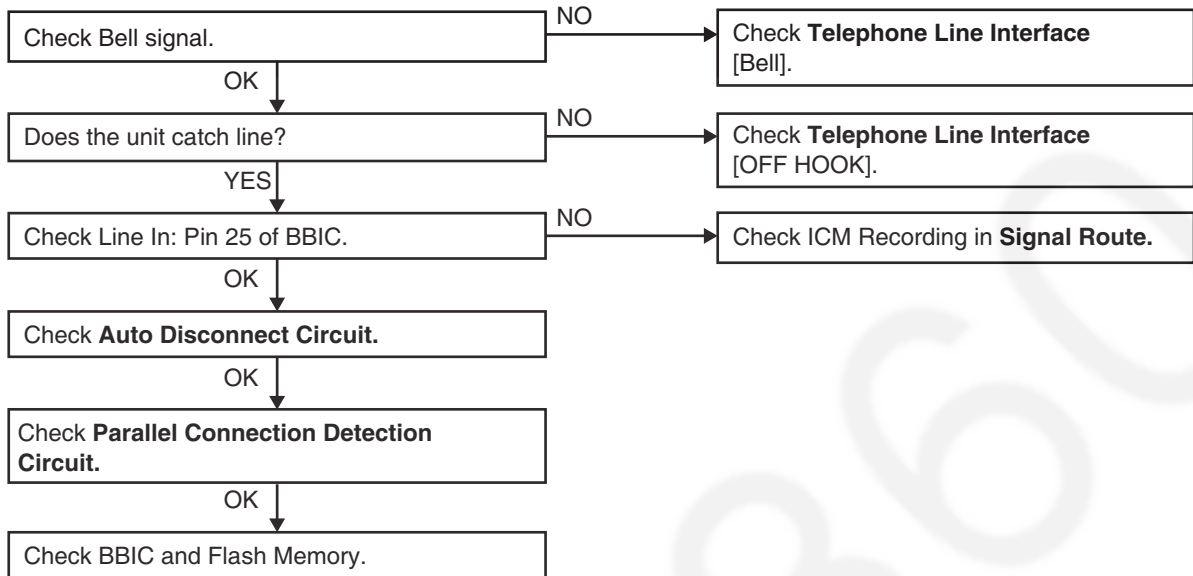


Cross Reference:
Power Supply Circuit/Reset Circuit (P.22)

10.1.2. Check Record

10.1.2.1. Base Unit

Not record Incoming Message



Cross Reference:

Telephone Line Interface (P.16)

Parallel Connection Detect Circuit/Auto Disconnect Circuit (P.17)

Note:

Flash Memory is IC601.
BBIC is IC501.

<How to change the Auto Disconnect activation time and VOX level>

A) Auto Disconnect activation time:

Some Telephone Company lines (fiber or cable) ON Hook and OFF Hook voltages are lower than conventional lines, which may cause a malfunction of Auto Disconnect detection. To solve this problem, try changing the Auto Disconnect activation through the procedures below.

- 1) Press "MENU " key at standby Mode and "#" key.

Note: The set must power on and be linked.

- 2) Press "9", "0", "0", "0", "*" .

LCD (H/S)

```
Service ready
: _ _ _ _ _
BACK
```

- 3) Press "7", "3", "1".

```
Service ready
: 7 3 1 _
CLEAR
```

- 4) Then enter the below last digit;

last digit	"0"	Auto disconnect & CPC ^(*1) : enable . . . [default]
	"1"	Auto disconnect : enable ^(*1) CPC : disable
	"2"	Auto disconnect & CPC ^(*2) : disable

Note:

(*1) Both Auto Disconnect and CPC don't detect for the first 2 seconds.

(*2) If the "Disable" is selected, even if the parallel-connected telephone is OFF HOOK, the line isn't disconnected.

- 5) Back to "standby" mode automatically after step 4).
You can hear beep sound which is a confirmation tone.

B) Vox level:

It makes easier to detect a small voice (caller) by raising the sensitivity of VOX level. Therefore, the recording of TAM is not turned off during detection.

1) ~ 2) are same as (A).

3) Press "5","1","1".

Service ready
:5 1 1 _
CLEAR

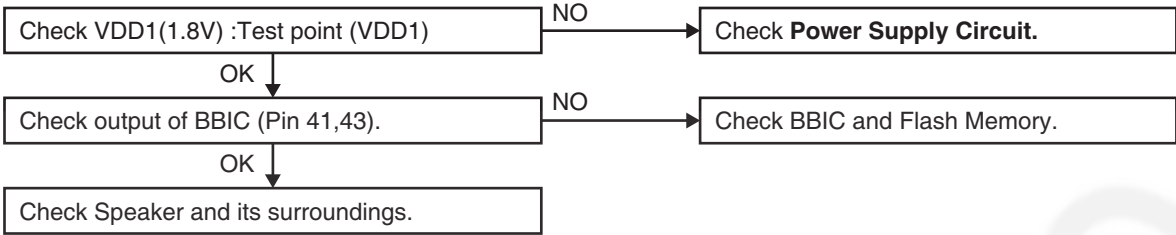
4) Then enter the below last digit;

last digit	"0"	default setting : normal
	"1"	6dB up

5) Back to "standby" mode automatically after step 4.
You can hear beep sound which is a confirmation tone.

10.1.3. Check Playback

10.1.3.1. Base Unit

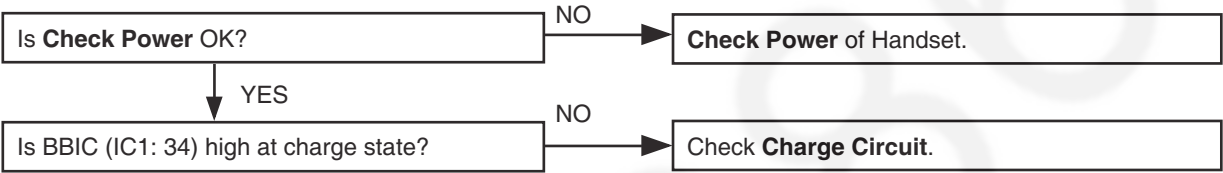


Cross Reference:
Power Supply Circuit/Reset Circuit (P.15)

Note:
 Flash Memory is IC601.
 BBIC is IC1.
 (*1) Refer to **Circuit Board (Base Unit_Main) (P.87)**.

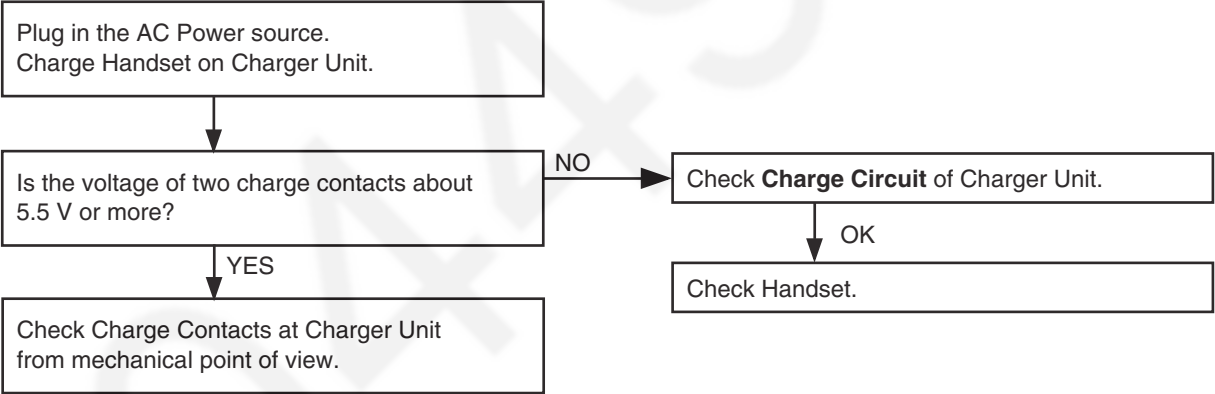
10.1.4. Check Battery Charge

10.1.4.1. Handset



Cross Reference:
Check Power (P.32)
Charge Circuit (P.23)

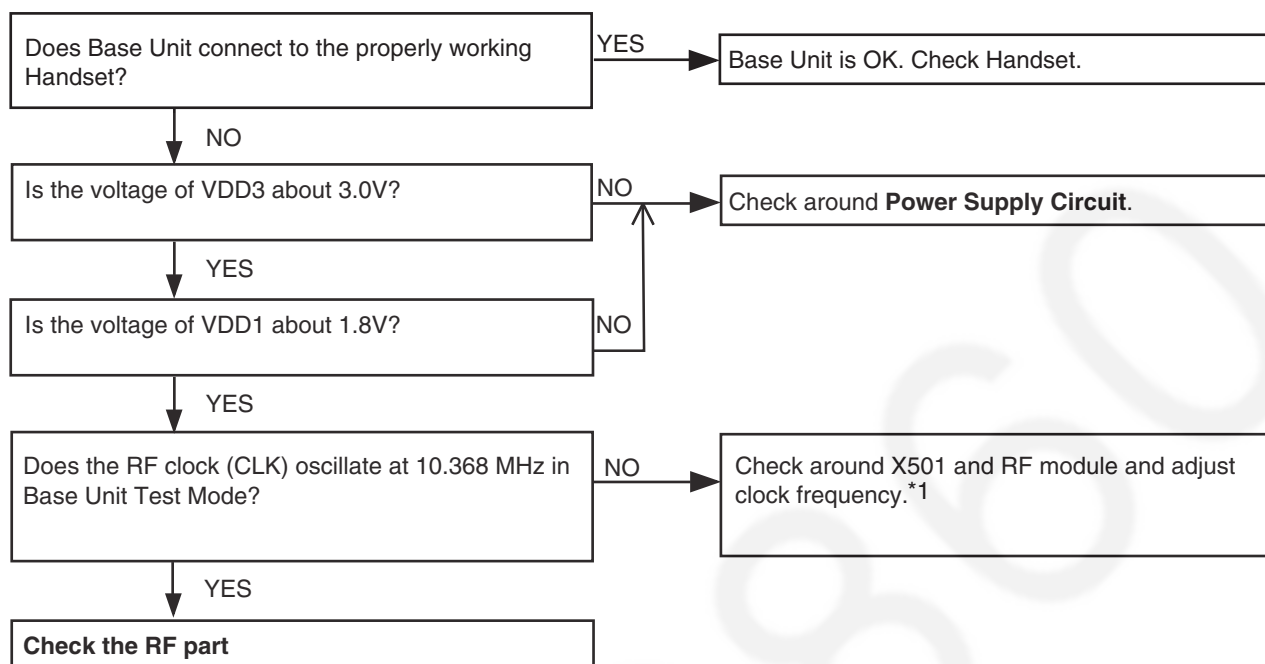
10.1.4.2. Charger Unit



Cross Reference:
Charge Circuit (P.23)

10.1.5. Check Link

10.1.5.1. Base Unit



Cross Reference:

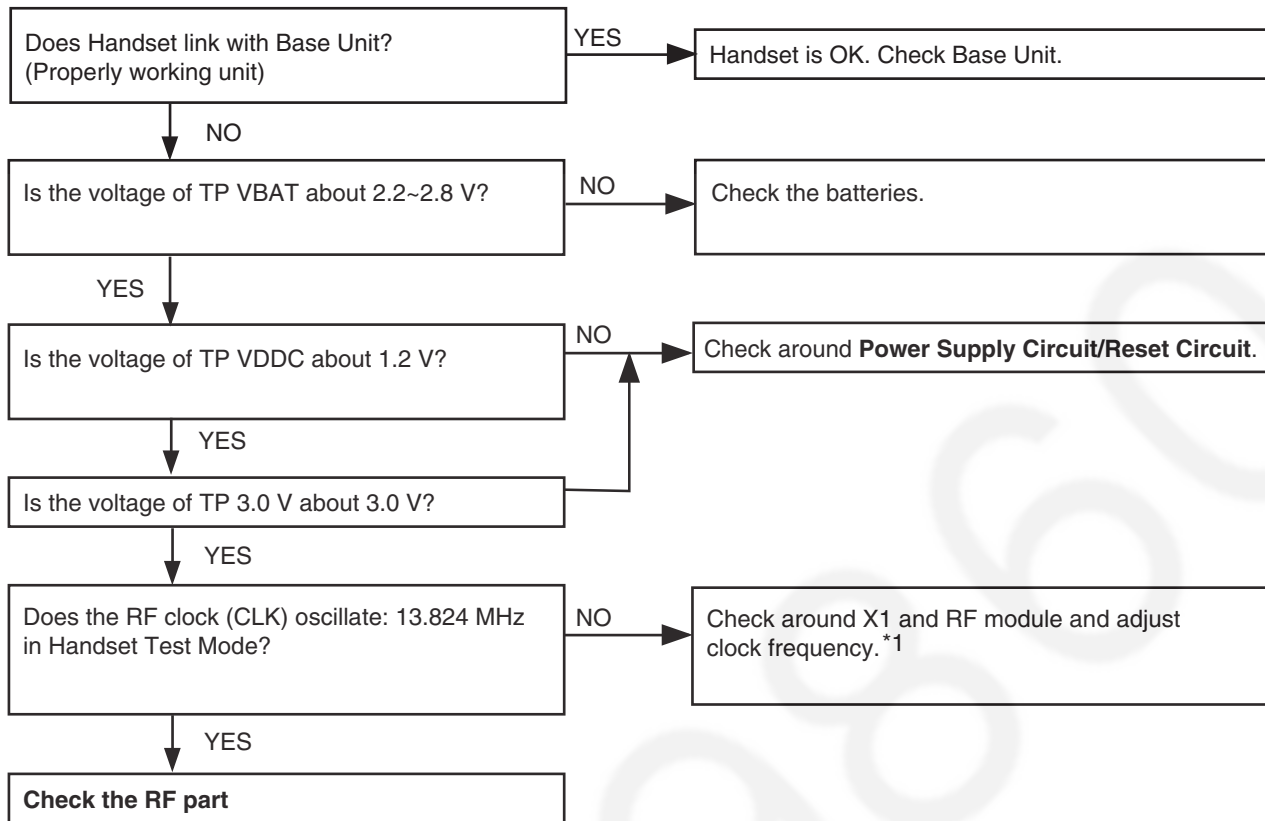
Power Supply Circuit/Reset Circuit (P.15)

Check the RF part (P.39)

Note:

Refer to **Things to Do after Replacing X'tal** (P.57)(P.63) for Base Unit.

*1 How to adjust the frequency of X501.

10.1.5.2. Handset**Cross Reference:****Power Supply Circuit/Reset Circuit (P.22)****Check the RF part (P.39)****Note:**Refer to **Things to Do after Replacing X'tal** (P.58)(P.67) for Handset.

*1 How to adjust the frequency of X1.

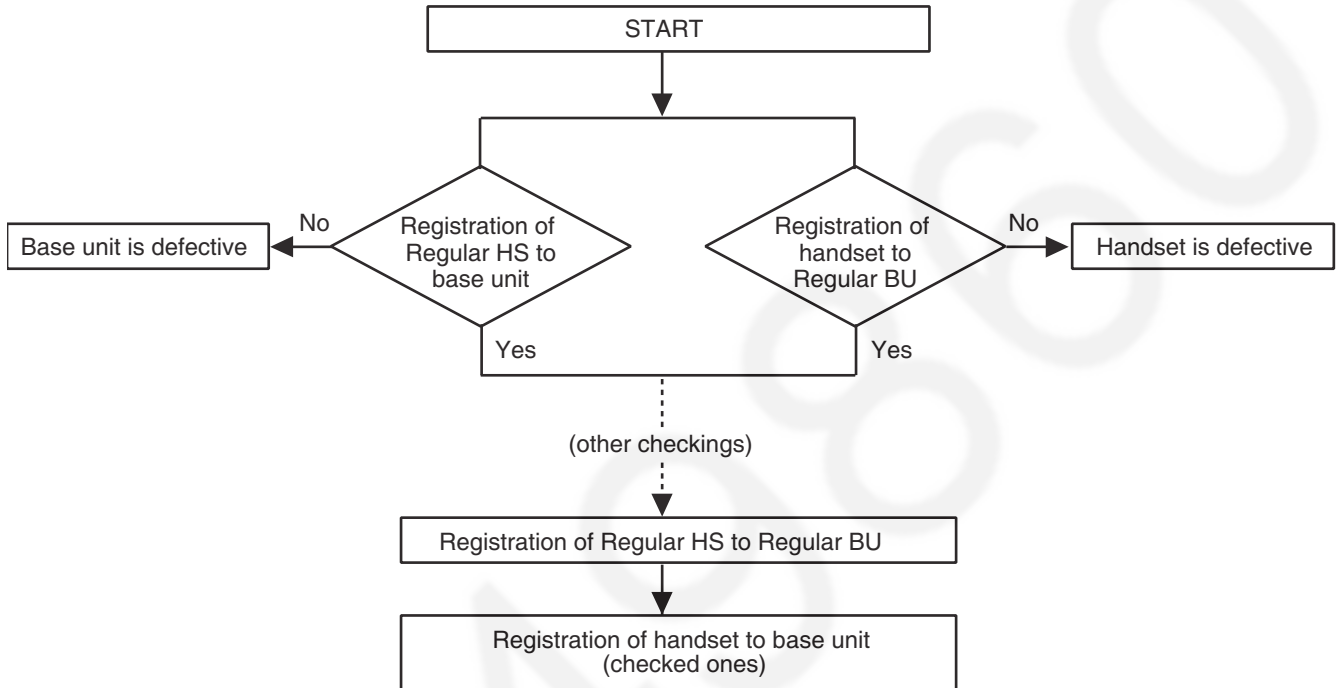
10.1.6. Check the RF part

10.1.6.1. Finding out the Defective part

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

After All the Checkings or Repairing

1. Re-register the checked handset to the checked base unit, and Regular HS to Regular BU.



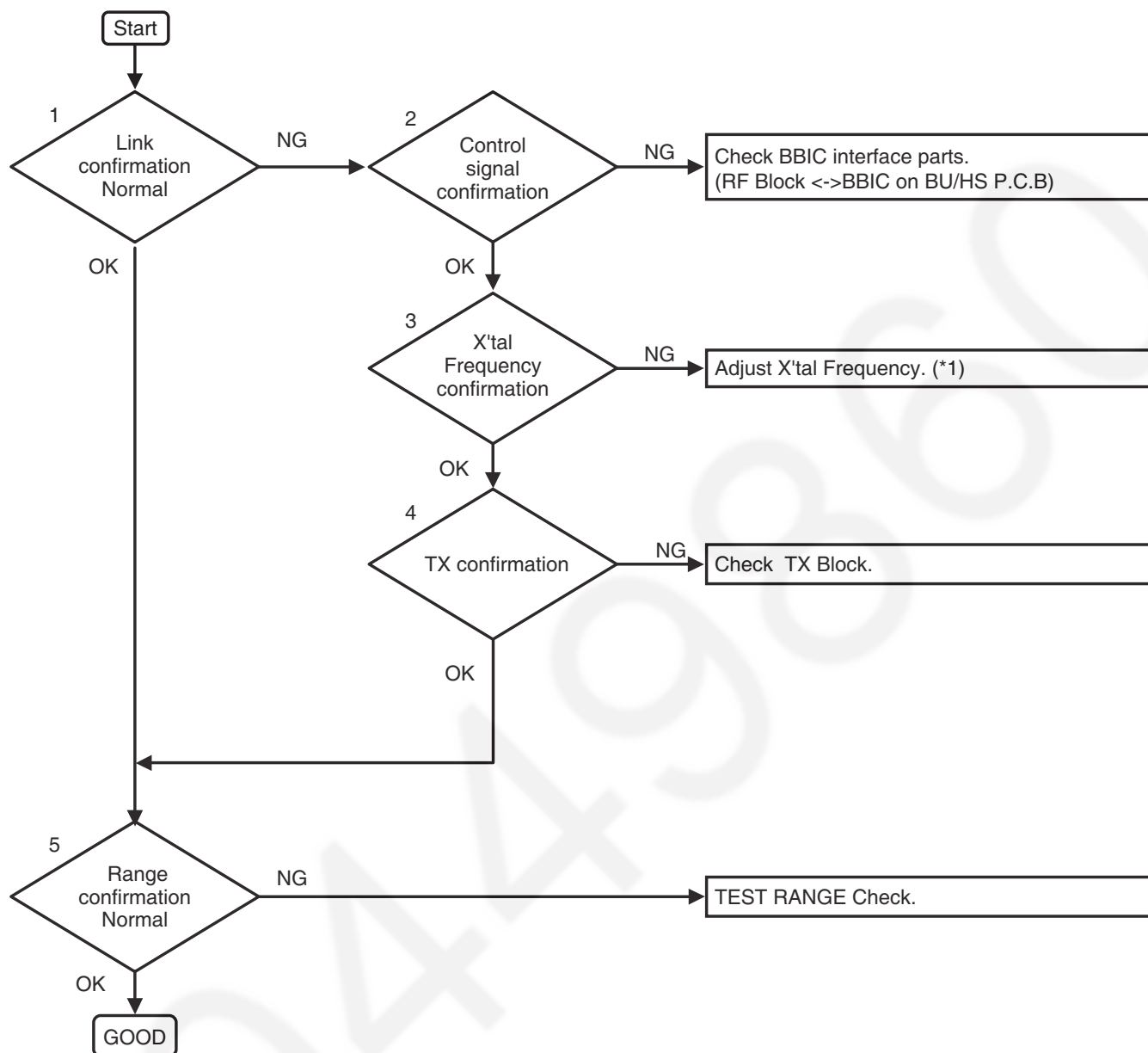
Note:

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

10.1.6.2. RF Check Flowchart

Each item (1 ~ 5) of RF Check Flowchart corresponds to **Check Table for RF part** (P.41).

Please refer to the each item.



Note:

(*1) Refer to **Check Link** (P.37).

10.1.6.3. 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: [Adjustment]	Check X'tal Frequency. (10.368 MHz $\pm$ 100Hz)	Check X'tal Frequency. (13.824 MHz $\pm$ 100 Hz)
3	TX confirmation HS Mode: HS_Burst Mode] (*1) BS Mode: BS_Burst Mode] (*1)	1. Remove wire antenna 2 and connect spectrum analyzer to TP. (*2) 2. Confirm TX power whether spec. is satisfied. Power $\geq$ 13.5dBm	1. Connect spectrum analyzer to TP. (*3) 2. Confirm TX power whether satisfied spec. Power $\geq$ 16.0dBm
4	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 **Commands** (P.60)

(*2) **Adjustment Standard (Base Unit)** (P.61)

(*3) **Adjustment Standard (Handset)** (P.62)

10.1.6.4. TEST RANGE Check

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

Item	BU (Base Unit) Check	HS (Handset) Check
Range Confirmation TX TEST (TX Power check) HS, BU setting Checked unit: Low TX power (*1) Regular unit: High TX power (*1)	1. Register Regular HS to BU (to be checked). 2. Set TX Power of the BU and the Regular HS according to CHART1. 3. At distance of about 20m between HS and BU, Link OK = TX Power of the BU is OK. No Link = TX Power of the BU is NG.	1. Register HS (to be checked) to Regular BU. 2. Set TX Power of the HS and the Regular BU according to CHART1. 3. At distance of about 20m between HS and BU, Link OK = TX Power of the HS is OK. No Link = TX Power of the HS is NG.
Range Confirmation RX TEST (RX sensitivity check) HS, BU setting Checked unit: High TX power (*1) Regular unit: Low TX power (*1)	1. Register Regular HS to BU (to be checked). 2. Set TX Power of the BU and the Regular HS according to CHART1. 3. At distance of about 20m between HS and BU, Link OK= RX Sensitivity of the BU is OK. No Link = RX Sensitivity of the BU is NG.	1. Register HS (to be checked) to Regular BU. 2. Set TX Power of the Checking HS and the Regular BU according to CHART1. 3. At distance of about 20m between HS and BU, Link OK= RX Sensitivity of the HS is OK. No Link = RX Sensitivity of the HS is NG

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

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

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

Note:

(*1) Refer to **Commands** (P.60).

10.1.7. 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.
- The next step must be completed within 90 seconds.

3 Handset:

Press **[OK]**, then wait until a long beep sounds.

Note:

- While registering, “Base in registering” is displayed on all registered handsets.
- When you purchase an additional handset, refer to the additional handset’s installation manual for registration.

10.1.8. 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.

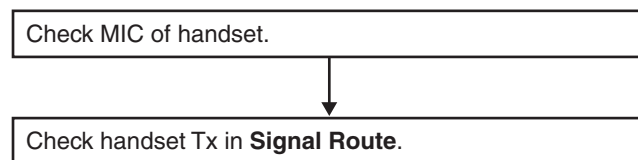
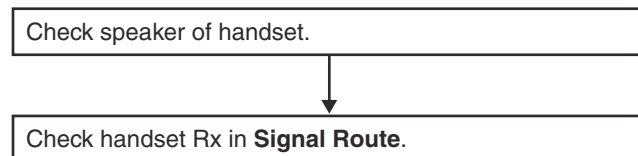
1 [MENU] → #131

- All handsets registered to the base unit are displayed.

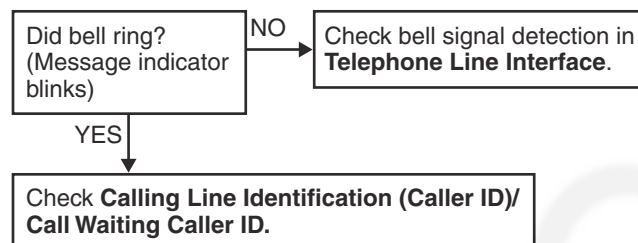
2 [↕]: Select the handset you want to cancel. → [SELECT]

3 [↕]: “Yes” → [SELECT]

4 [OFF]

10.1.9. Check Handset Transmission**10.1.10. Check Handset Reception****Note:**

When checking the RF part, Refer to **Check the RF part** (P.39).

10.1.11. Check Caller ID**BASE UNIT****Cross Reference:**

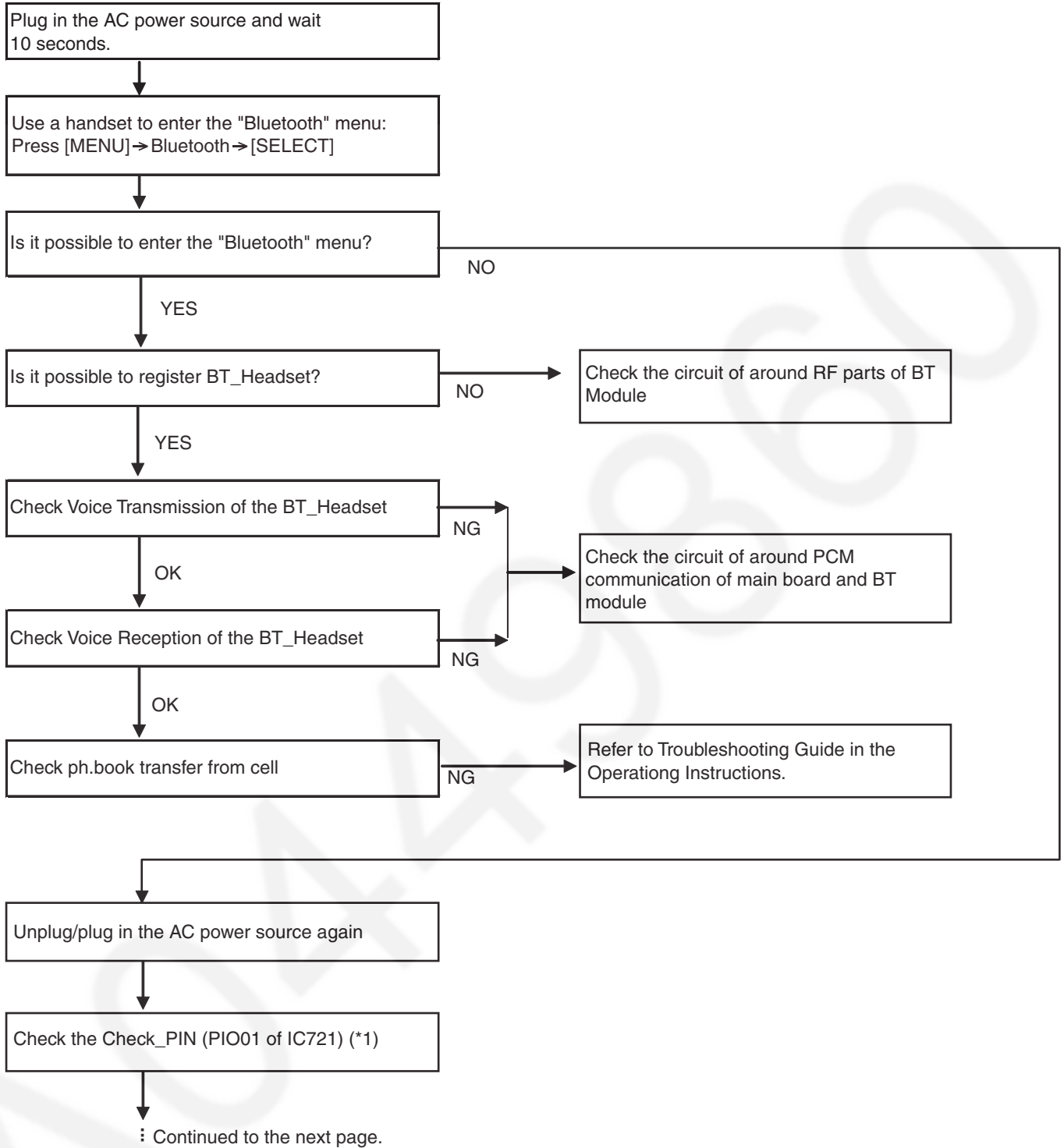
Telephone Line Interface (P.16)

Calling Line Identification (Caller ID)/Call Waiting Caller ID (P.18)

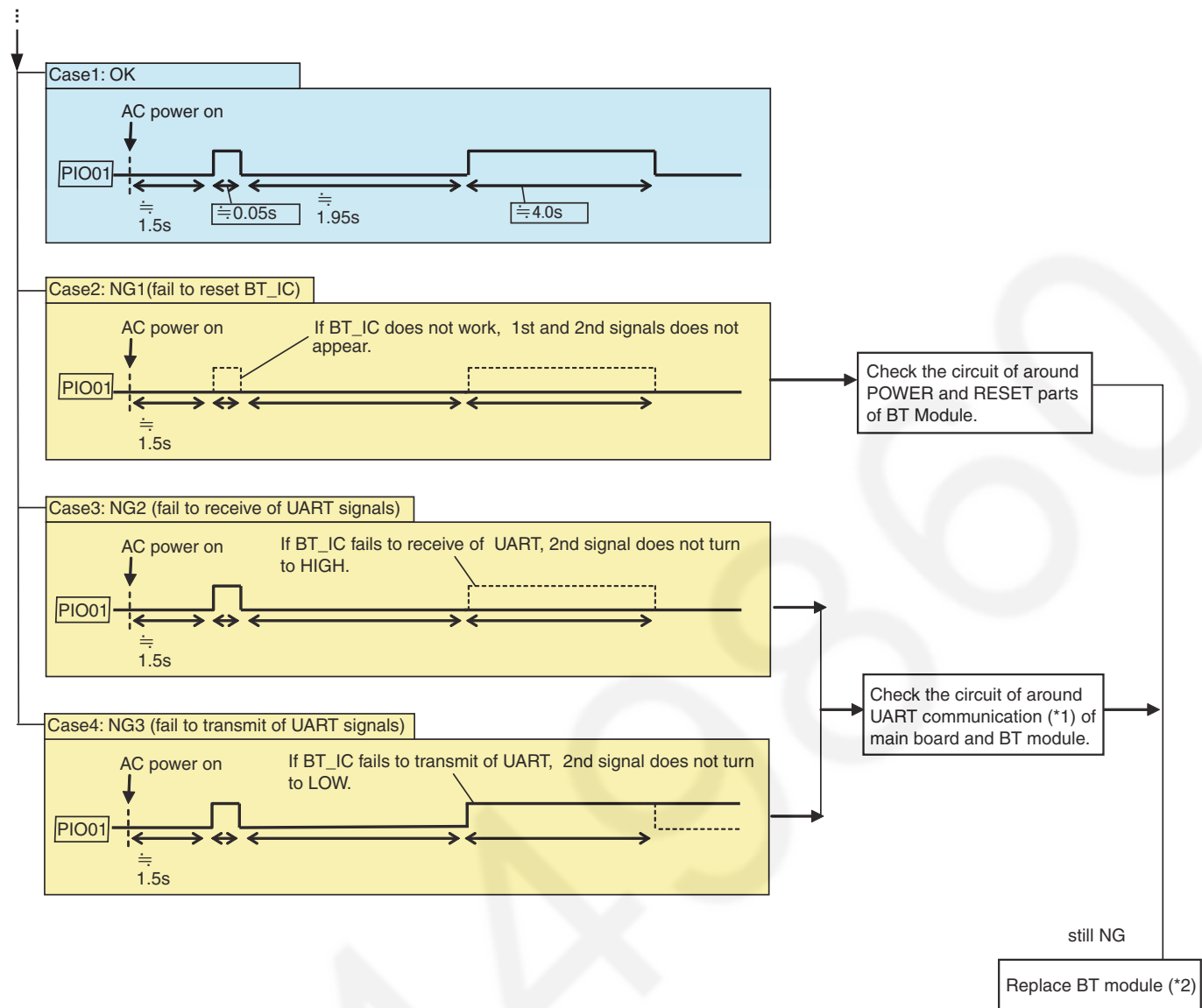
Note:

- Make sure the format of the Caller ID service of the Telephone company that the customer subscribes to.
- It is also recommended to confirm that the customer is really a subscriber of the service.

10.1.12. Check BT Communication



Cross Reference:
Bottom View (P.88)



Cross Reference:

Schematic Diagram (BT module) (P.76)

Note:

(*2) After replacing, need to adjust the frequency of BT.
Refer to **Things to Do after Replacing X'tal** (P.63)

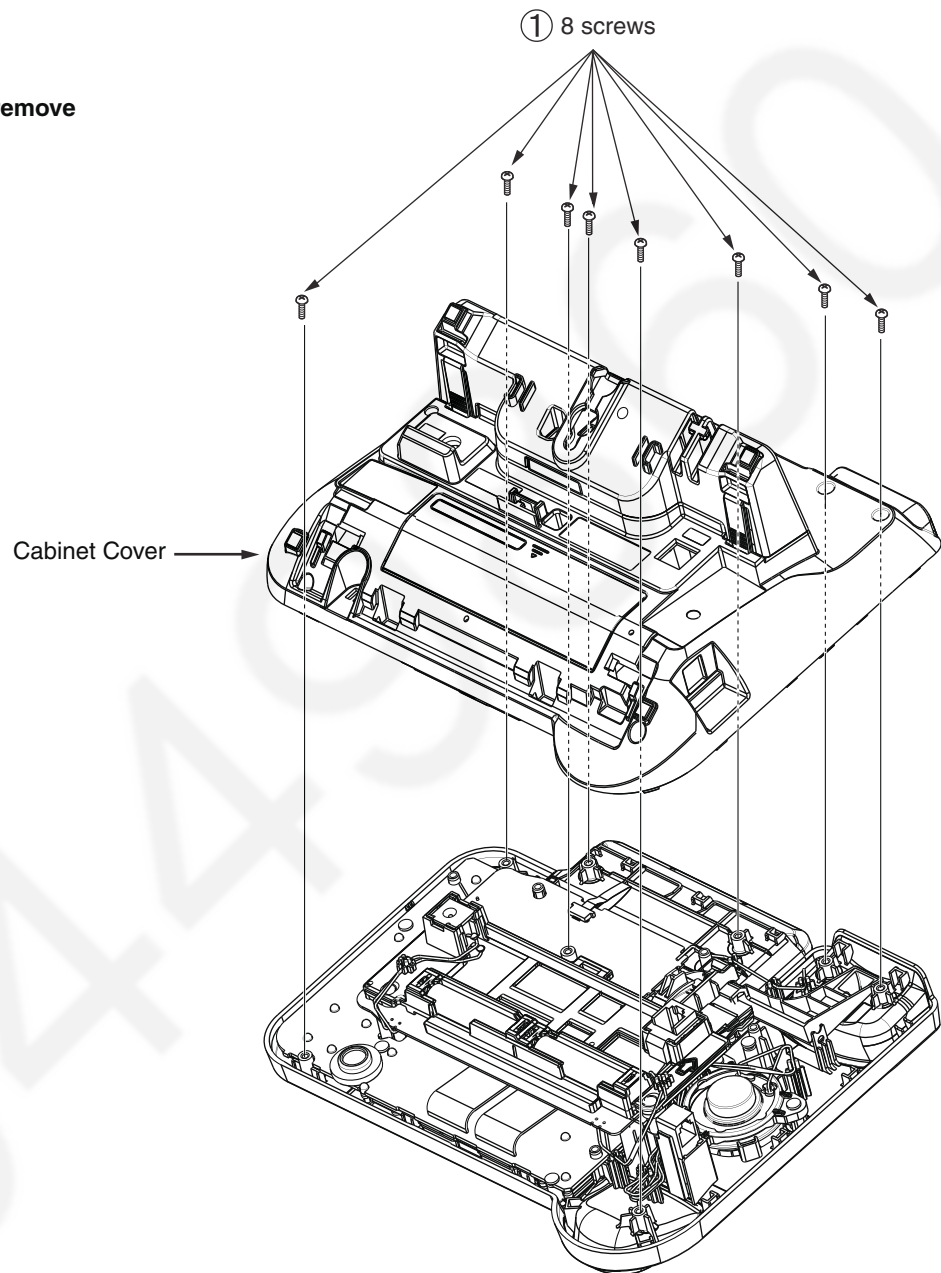
11 Disassembly and Assembly Instructions

11.1. Disassembly Instructions

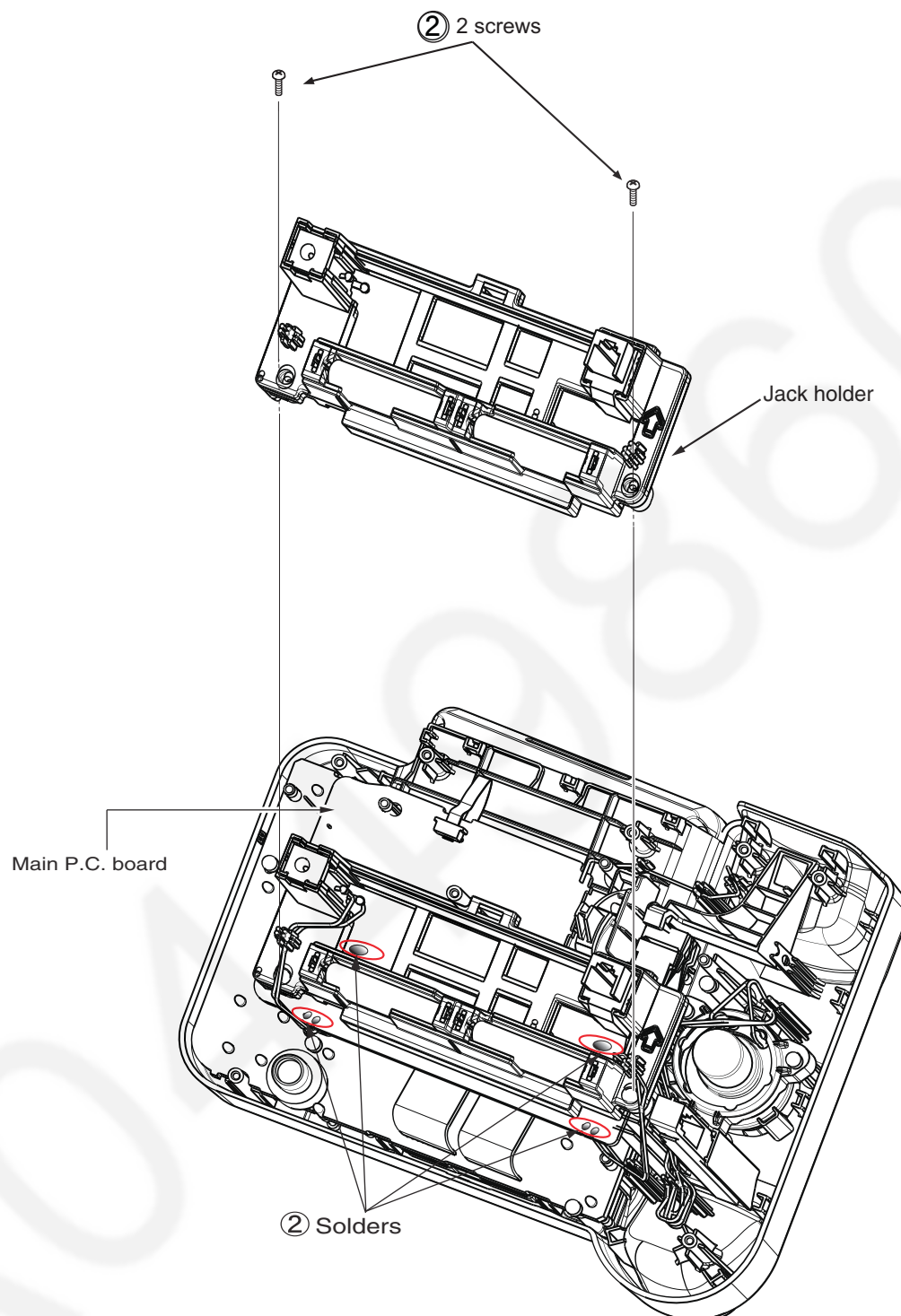
11.1.1. Base Unit

11.1.1.1. KX-TGF380

- ① Remove 8 screw to remove the cabinet cover.

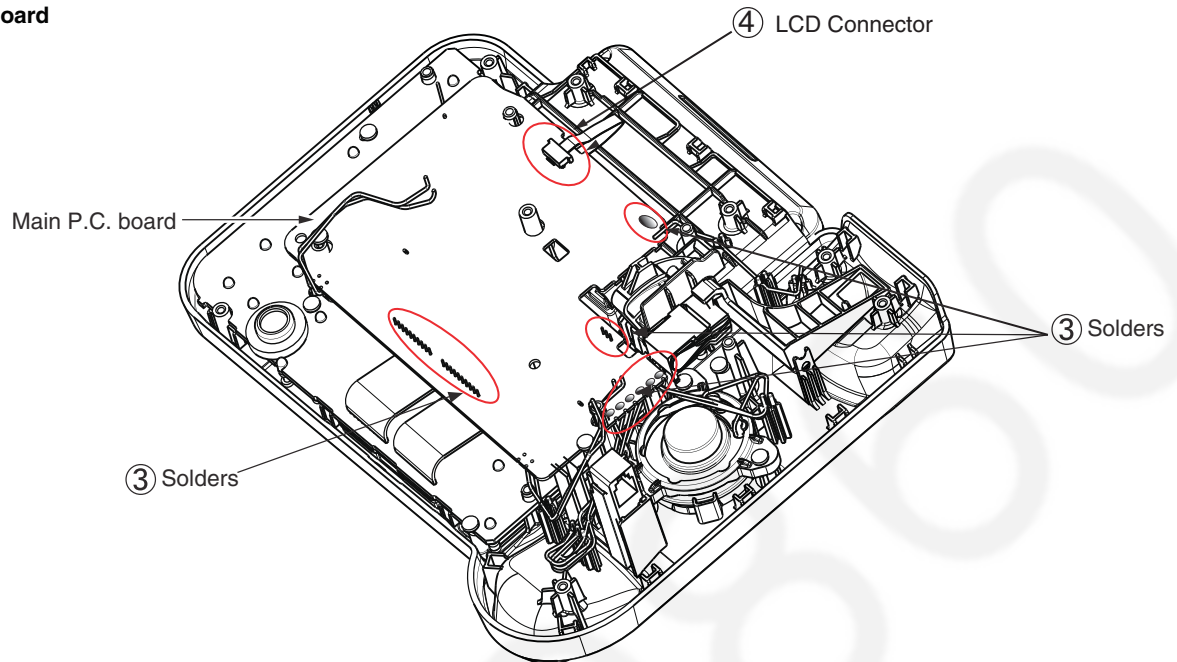


- ② Remove screws and solders to remove the Jack Holder.

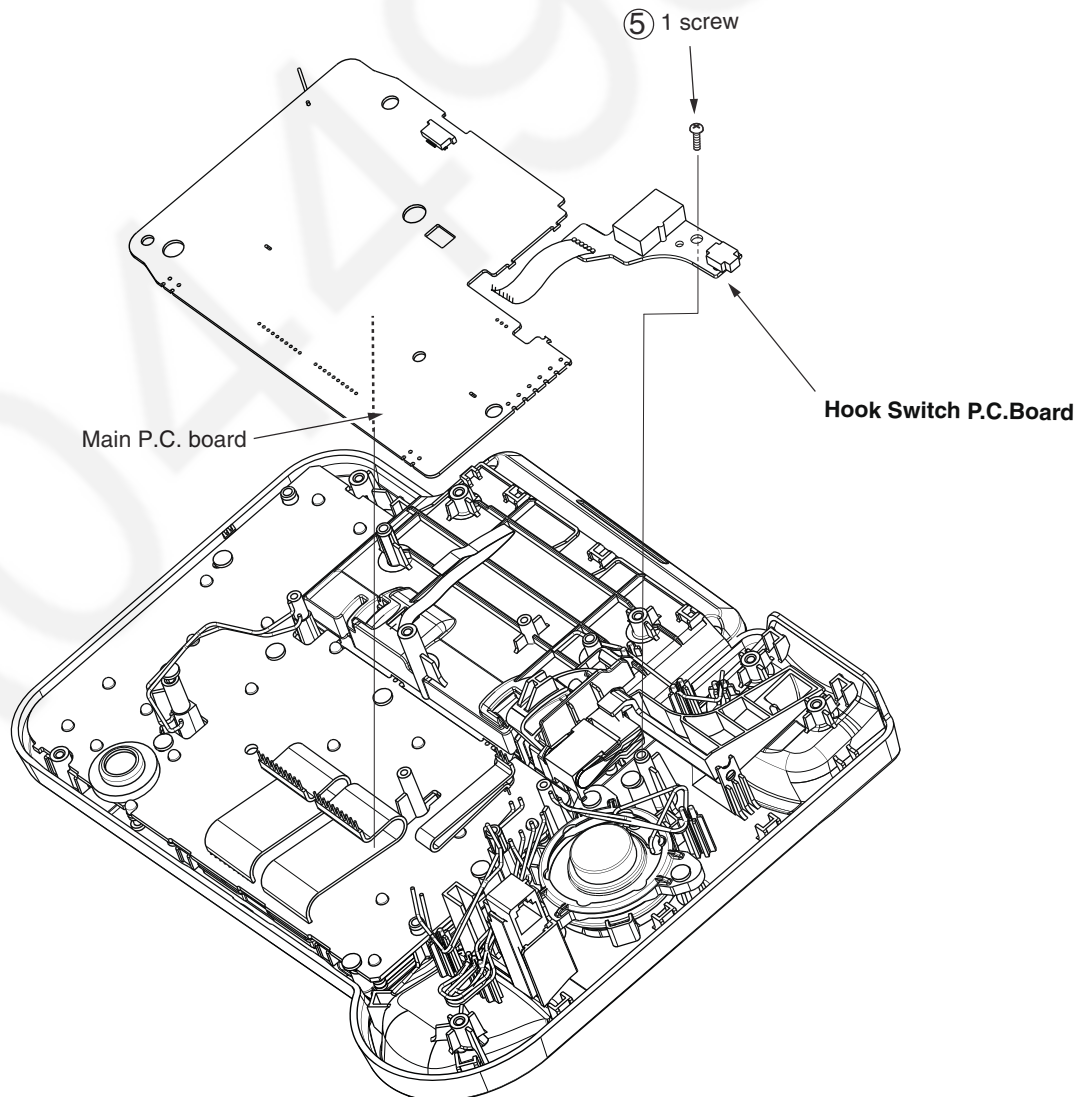


③ Unsolder to remove the Main P.C.Board

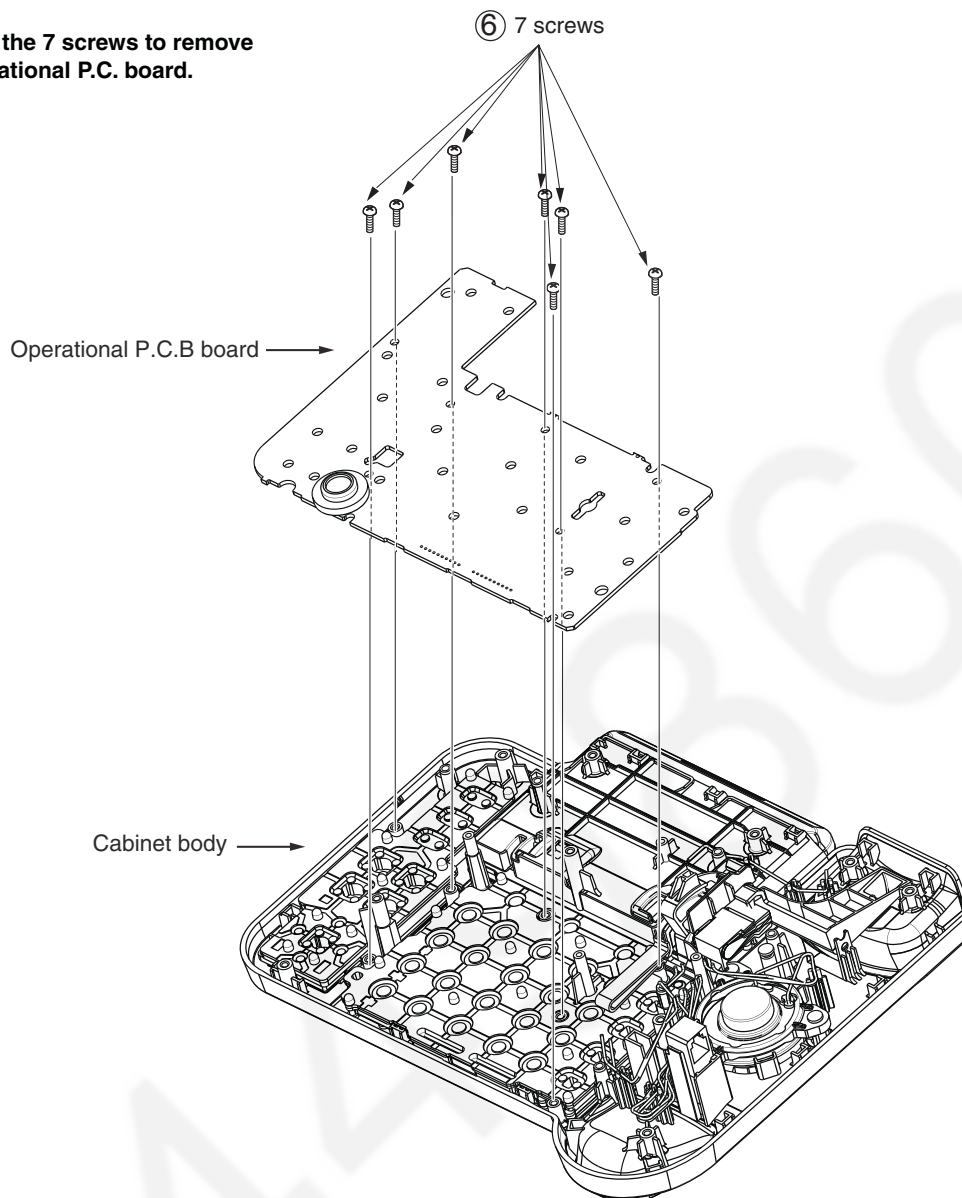
④ Take out the LCD connector from Main P.C. board



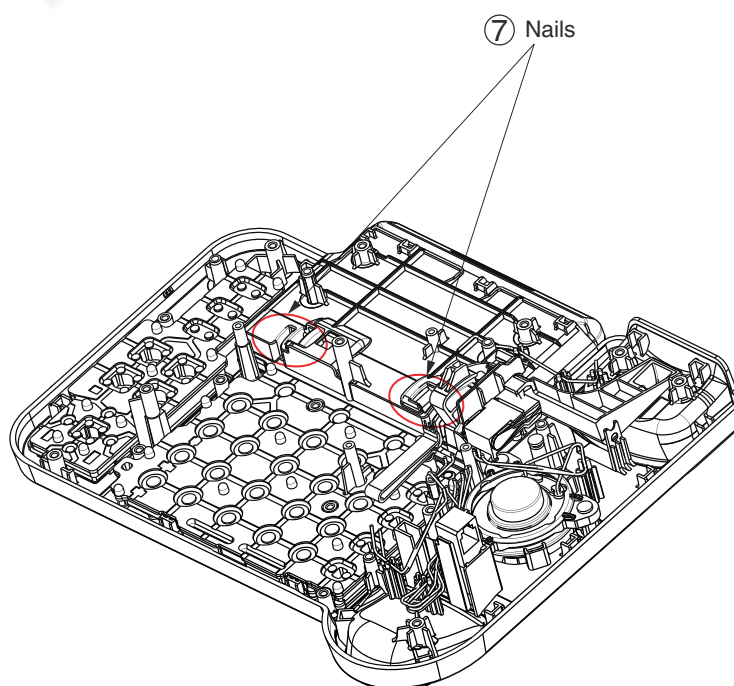
⑤ Remove screw to remove Hook Switch P.C.Board



- ⑥ Remove the 7 screws to remove the operational P.C. board.



- ⑦ Remove the 2 nails to remove the LCD Unit.



- ⑧ Remove 2 screws to remove the cabinet cover.

⑧ Cabinet cover

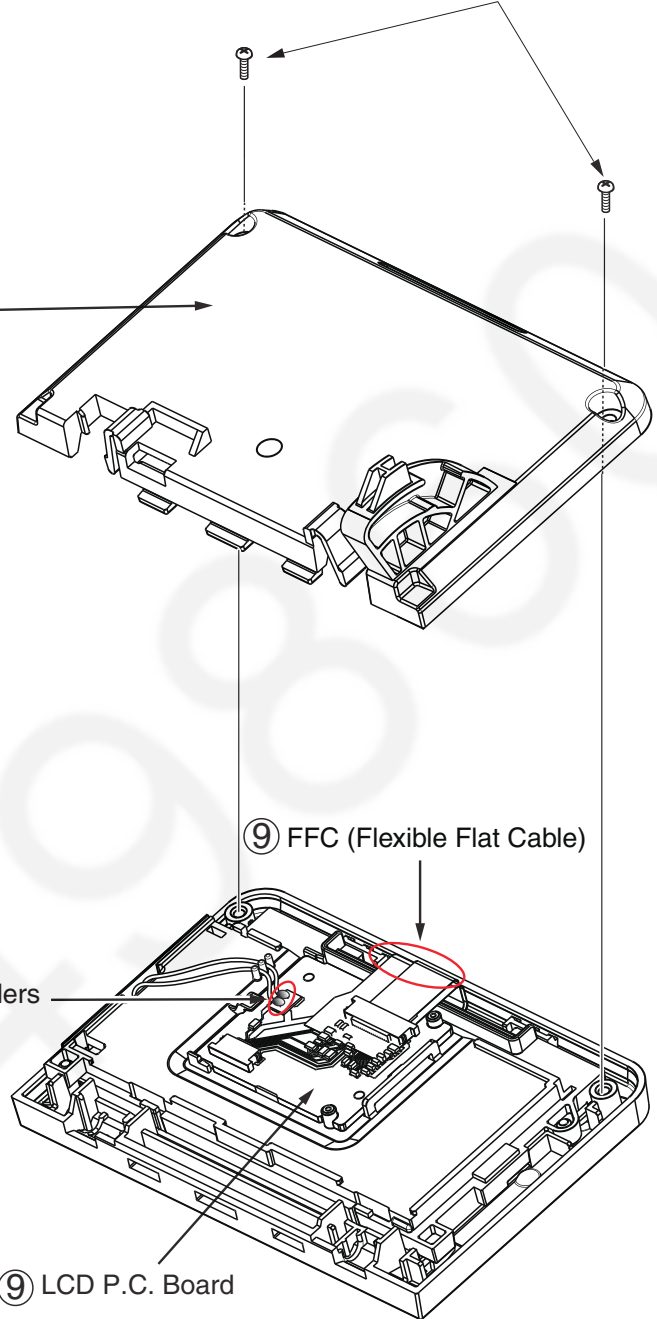
⑧ 2 screws

- ⑨ Remove the solder and FFC (Flexible Flat Cable) to remove the LCD P.C. Board.

⑨ FFC (Flexible Flat Cable)

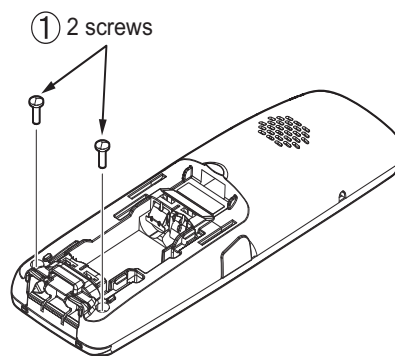
⑨ Solders

⑨ LCD P.C. Board

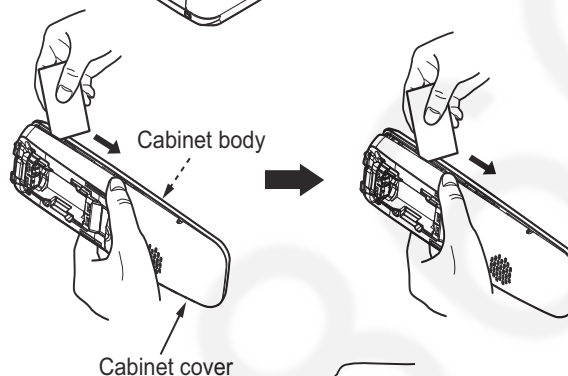


11.1.2. Handset

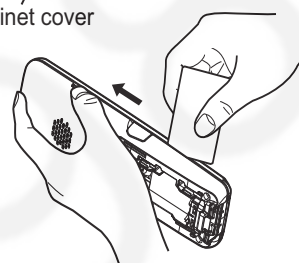
- ① Remove the 2 screws.



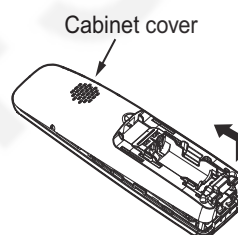
- ② Insert a JIG (PQDJ10006Y) between the cabinet body and the cabinet cover, then pull it along the gap to open the cabinet.



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



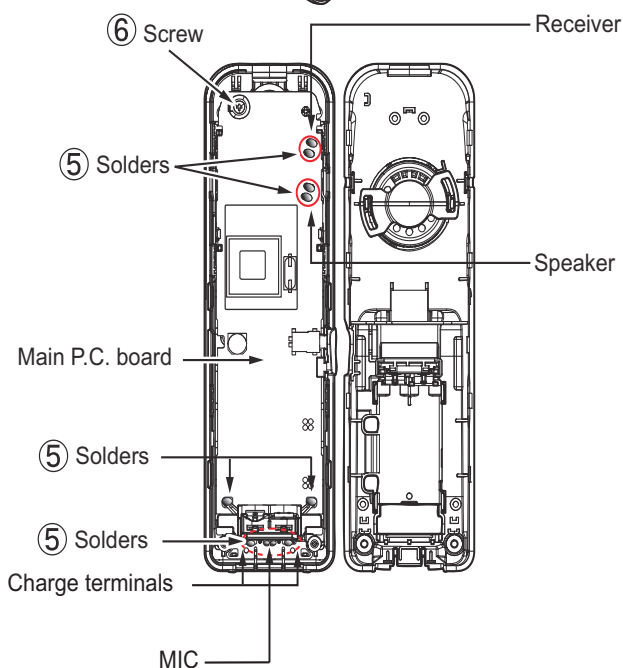
- ④ Remove the cabinet cover by pushing it upward.



- ⑤ Remove the solders.

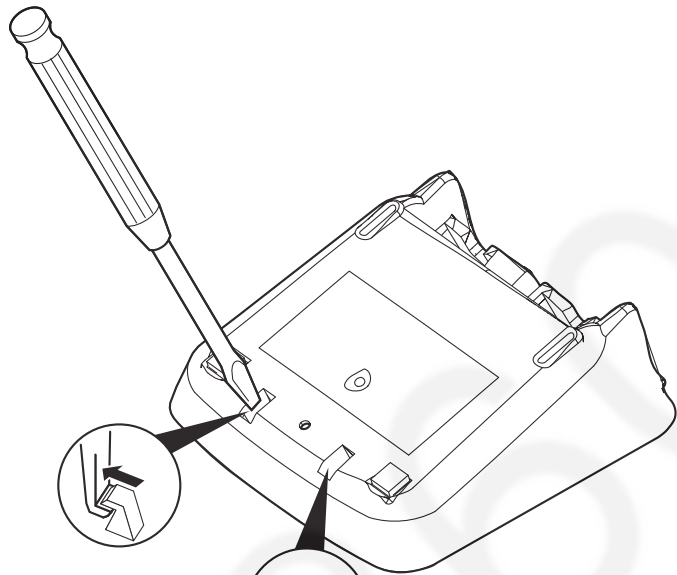
⑤ Solders

- ⑥ Remove the screw to remove the main P. C. board.

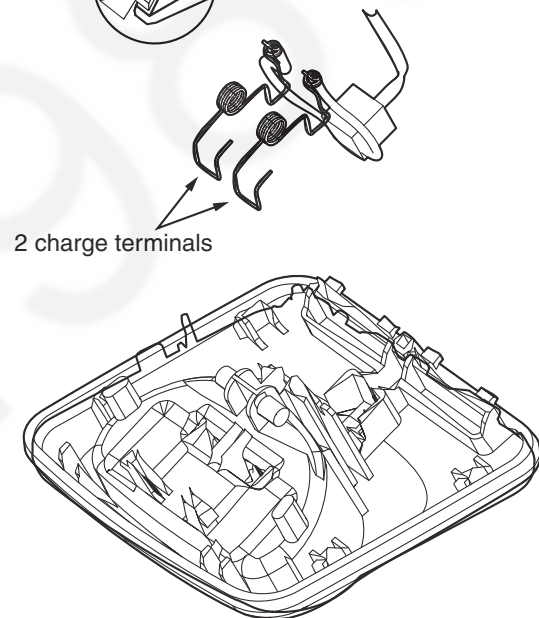


11.1.3. Charger Unit

① Unhook the click of one side.



② Then unhook the other one.



11.1.4. How to Replace the Base unit LCD

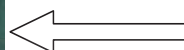
①



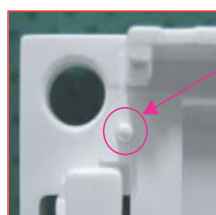
LCD HOLDER



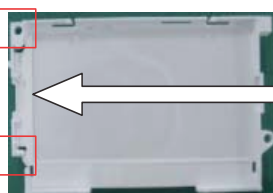
LCD PLATE



②

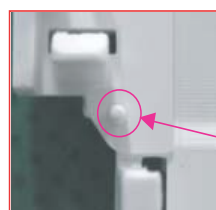


*PROCESS IT AS SHOWN IN FIGURE.



REFLECTOR SHEET

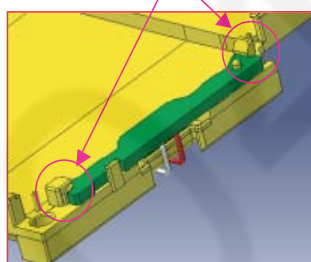
**colour is Black (PNHX1689YA/Z1)



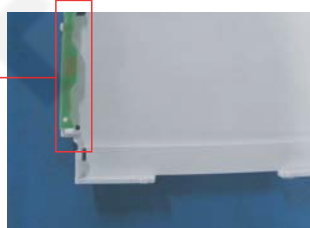
*PROCESS IT AS SHOWN IN FIGURE.

③

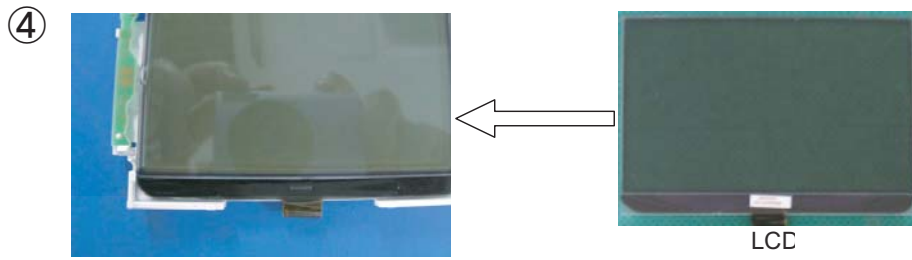
*PROCESS IT AS SHOWN IN FIGURE.



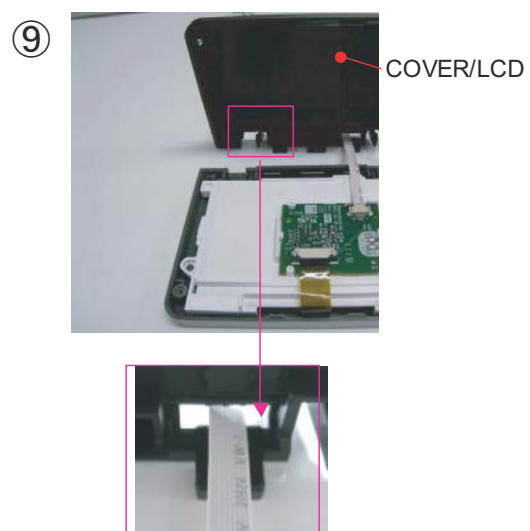
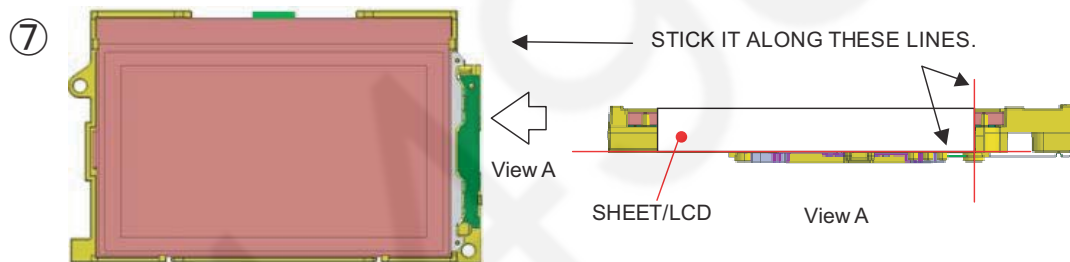
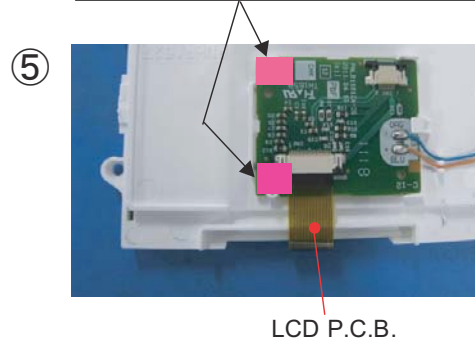
REVERSE.



LED P.C.B.



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



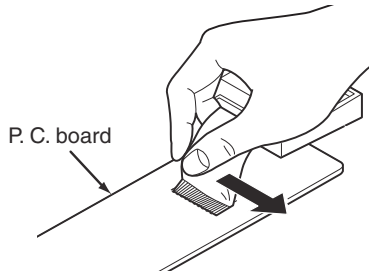
*INSERT FFC IN THE HOLE OF COVER/LCD.

11.2. How to Replace the Handset LCD

Note:

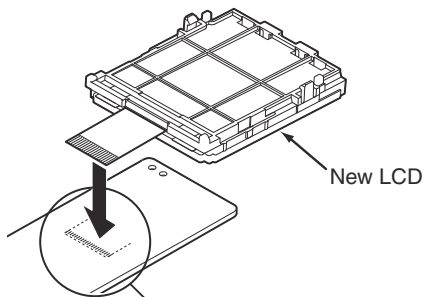
The illustrations are simplified in this page.
They may differ from the actual product.

①

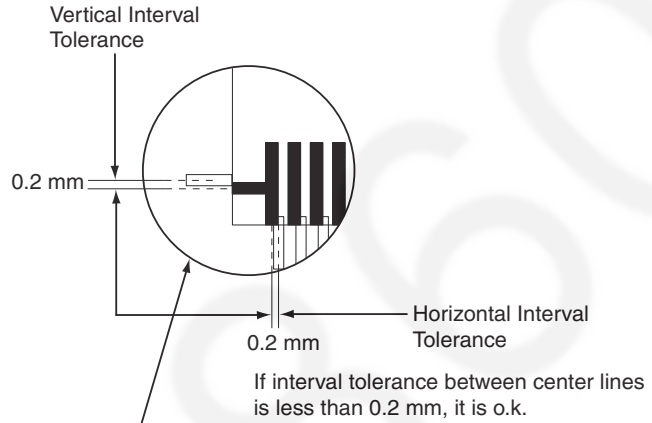


Peel off the FFC (Flexible Flat Cable) from the LCD, in the direction of the arrow. Take care to ensure that the foil on the P.C. board is not damaged.

②

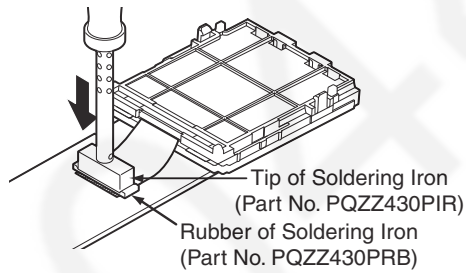


Fit the heatseal of a new LCD.

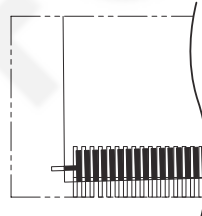


OK

③

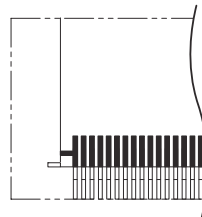


Heatweld with the tip of the soldering iron about 5 to 8 seconds (in case of 60W soldering iron).



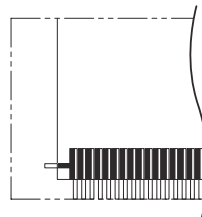
NG

(Inclined)



NG

(Vertical interval tolerance is more than 0.2 mm.)



NG

(Horizontal interval tolerance is more than 0.2 mm.)

12 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.31)**

12.1. Equipment Required

- Digital multi-meter (DMM): it must be able to measure voltage and current.
 - Oscilloscope.
 - Frequency counter: It must be precise enough to measure intervals of 1 Hz (precision; ± 4 ppm)
Hewlett Packard, 53131A is recommended.
 - DECT tester: Rohde & Schwarz, CMD 60 is recommended.
- This equipment may be useful in order to precisely adjust like a mass production.

12.2. The Setting Method of JIG

<Preparation>

- Serial JIG cable: PQZZ1CD300E*
- PC which runs in DOS mode
- **Batch file CD-ROM** for setting: Refer to part list of **Fixtures and Tools(P.106)**,

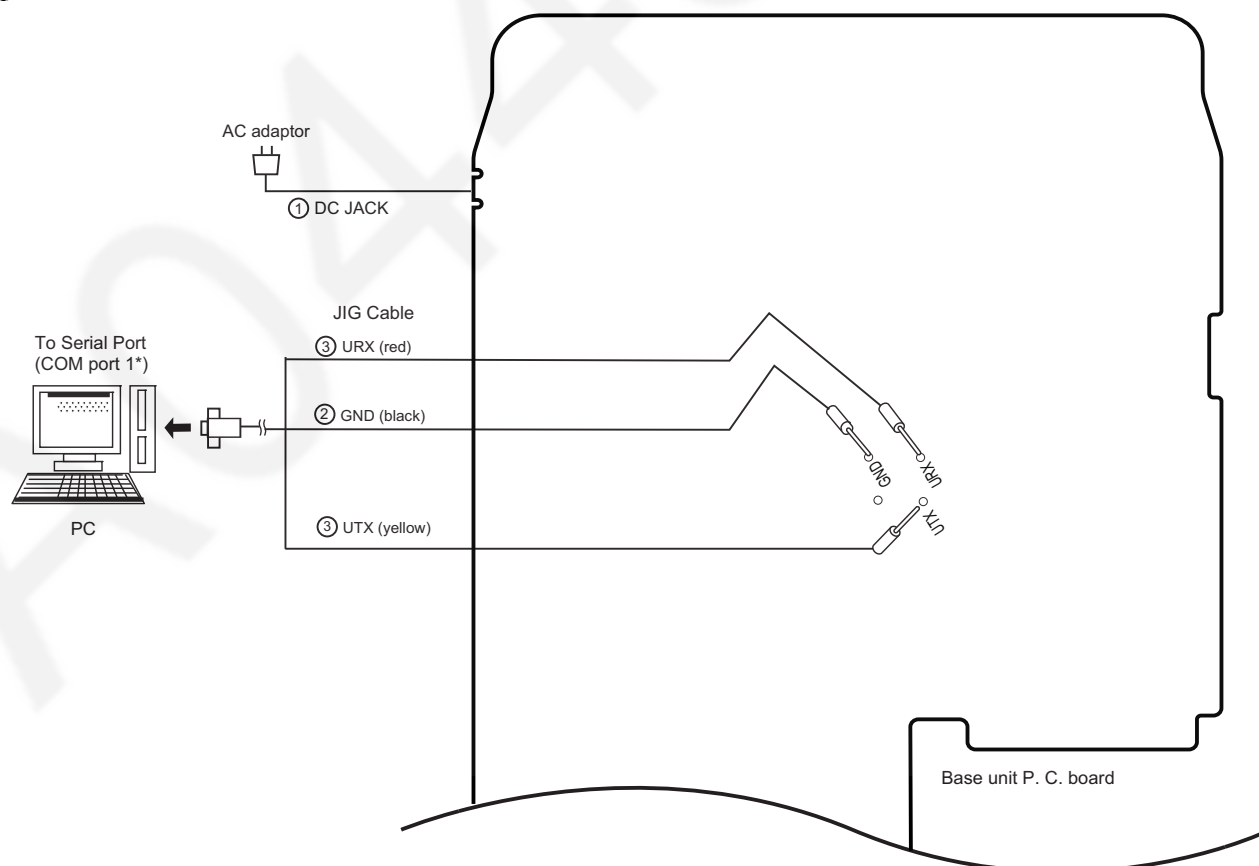
Note:

*: If you have the JIG Cable for TCD500 series (PQZZ1CD505E), change the following values of resistance. Then you can use it as a JIG Cable for both TCD300 and TCD500 series. (It is an upper compatible JIG Cable.)

Resistor	Old value (k Ω)	New value (k Ω)
R2	22	3.3
R3	22	3.3
R4	22	4.7
R7	4.7	10

12.2.1. Connections (Base Unit)

- ① Connect the AC adaptor.
- ② Connect the JIG Cable GND (black).
- ③ Connect the JIG Cable RX (red) and TX (yellow).

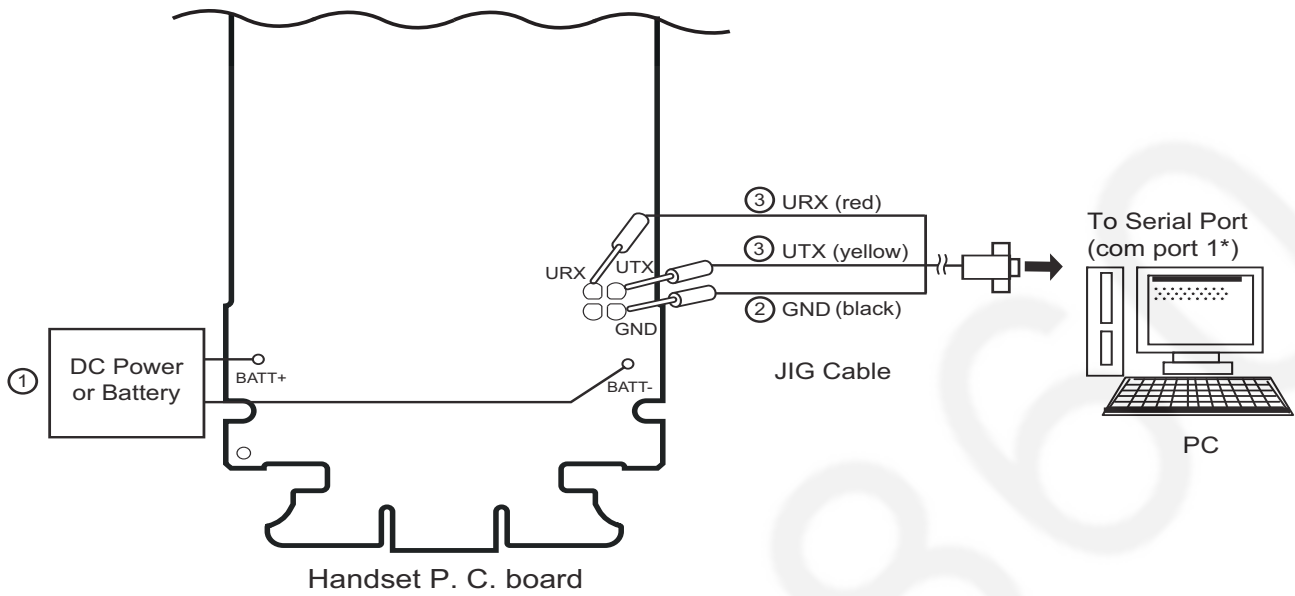


Note:

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

12.2.2. Connections (Handset)

- 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:

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

12.2.3. 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.

12.2.4. Commands

See the table below for frequently used commands.

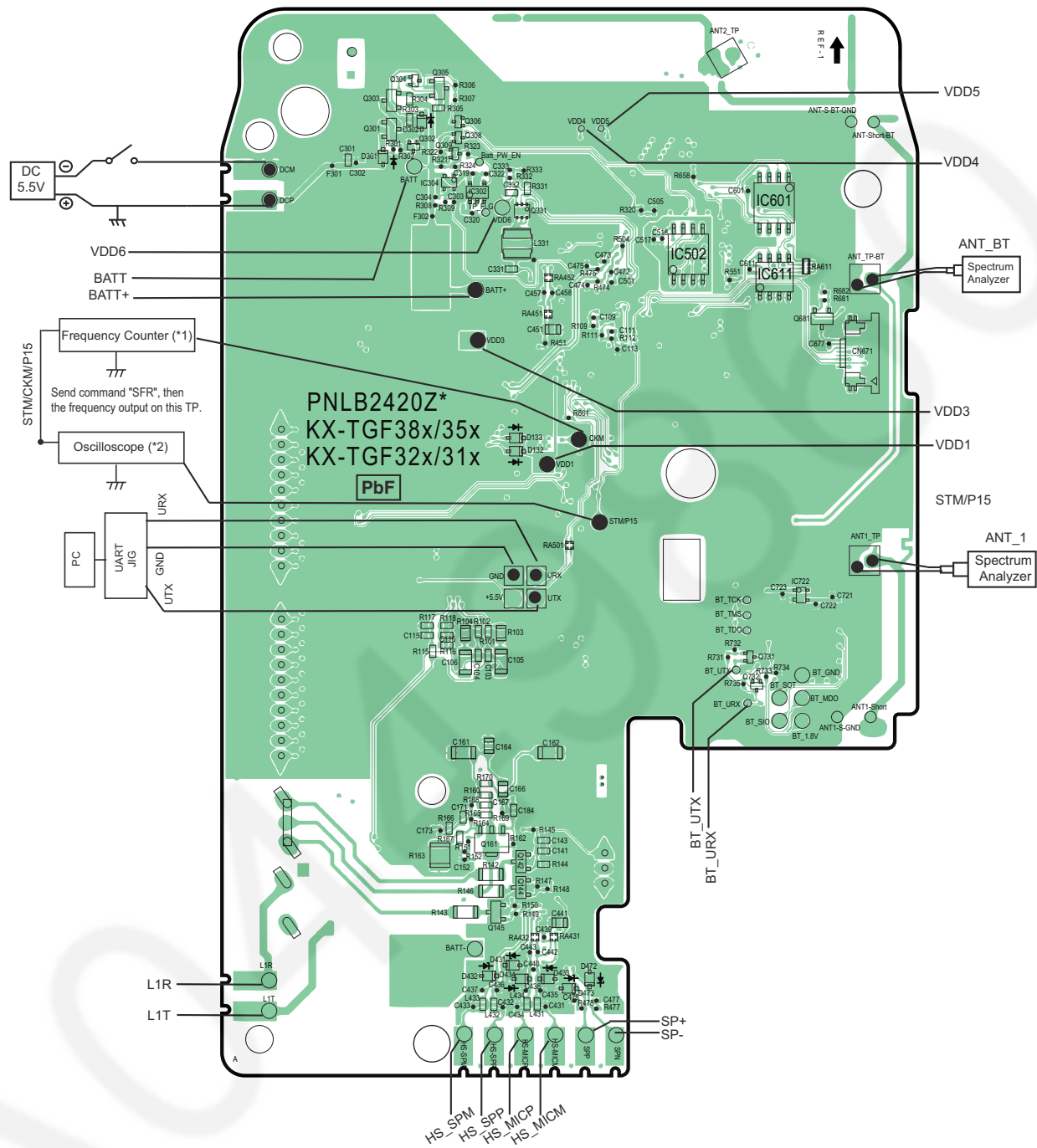
Command name		Function	Example
rdeeprom		Read the data of EEPROM/VES*	Type "rdeeprom 00 00 FF", and the data from address "00 00" to "FF" is read out.
readid		Read ID (RFPI)	Type "readid", and the registered ID is read out.
writeid		Write ID (RFPI)	Type "writeid 00 18 E0 0E 98", and the ID "0018 E0 0E 98" is written.
hookoff		Off-hook mode on Base	Type "hookoff".
hookon		On-hook mode on Base	Type "hookon".
getchk (Base unit)		Read checksum	Type "getchk".
How to use of "getchk" in Handset	1.rdeeprom	Read EEPROM/VES*	Type "RdEeprom 03 7D 04", and the data from address "03 7D" to "03 80" is read out *This command gets 4 byte "WW", "XX", "YY", "ZZ". *Please NEVER forget these 4 byte data!
	2.sendchar epw	Write EEPROM/VES*	Type "sendchar epw 03 7D 04 FF FF FF FF"
	3.sendchar RST	Reset baseset	Type "sendchar RST"
	4.getchk	Read checksum	Type "getchk".
	5.sendchar epw	Write EEPROM/VES*	Type "sendchar epw 03 7D 04 WW XX YY ZZ" *"WW", "XX", "YY", "ZZ" is 4 byte data that already read from same address.
wreeprom		Write the data of EEPROM/VES*	Type "wreeprom 01 23 45". "01 23" is address and "45" is data to be written.
bursttx		Burst TX mode	Type "bursttx"
testrx		Burst RX mode	Type "testrx"
tph		Keep TX power high	Type "tph"
tpl		Keep TX power low	Type "tpl"

*VES:Virtual EEprom system (adjustment data is stored in program Flash (IC502))

12.3. Adjustment Standard (Base Unit)

When connecting the simulator equipment for checking, please refer to below.

12.3.1. Bottom View



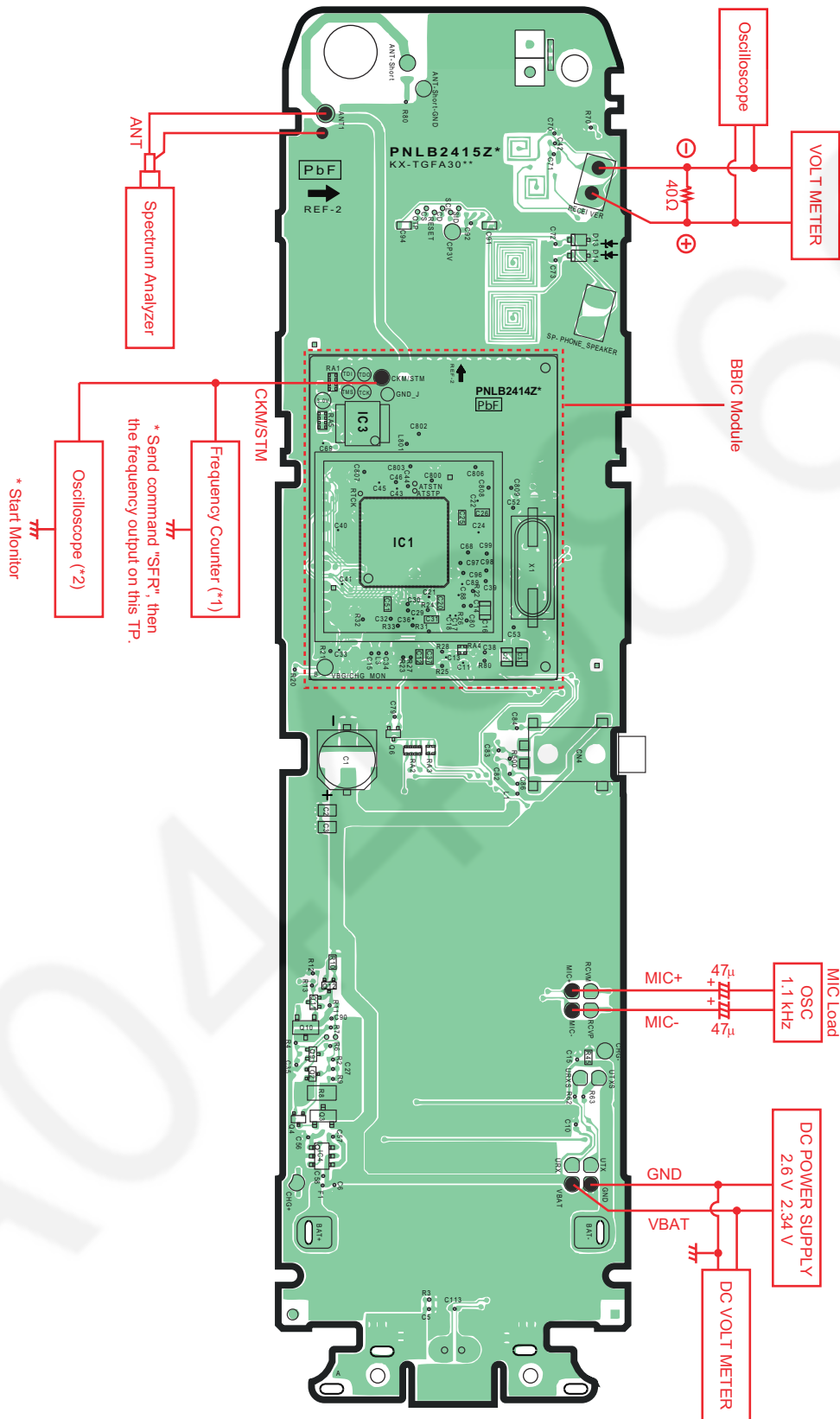
Note:

(*2) refers to **Power Supply Circuit/Reset Circuit (P.15)**

12.4. Adjustment Standard (Handset)

When connecting the simulator equipment for checking, please refer to below.

12.4.1. Component View



Note:

(*1) refers to No.2 of Check Table for RF part (P.41)

(*2) refers to Power Supply Circuit/Reset Circuit (P.22)

12.5. Things to Do after Replacing X'tal

If repairing or replacing EPROM 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.

12.5.1. How to download the data

12.5.1.1. Base Unit

First, operate the PC setting according to **The Setting Method of JIG** (P.57).

Then download the appropriate data according to the following procedures.

Items		How to download/Required adjustment
BBIC(IC501)	Programming data is stored in memory.	1) System Clock adjustment.
FLASH1 (IC601)	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 (IC502)	Program D/L	1) Update BBIC. Refer to How to update the BBIC. (P.64). 2) Detach the JIG cable, then disconnect the DC Power. 3) Connect the DC Power. 4) Connect the JIG cable again, and execute the command "getchk", then confirm the checksum value is correct. If the downloading failes, start again from step 1. 5) Execute the command "wreeprom 00 01 CC". Refer to 12.2.4. Commands. 6) Default bath file: Execute the command "default.bat" 7) Country version batch file: Execute the command "TGF38x_US_WW_RevXXX_YYY.bat". (*1) 8) Confirm DECT ID written in the label pated plastic bag of FLASH rom. 9) Write ID(PFPI): Write DECT ID in step 8. => Execute the command "writeid". Refer to 12.2.4. Commands. 10) Verify ID(PFPI): Execute the command "readid". Refer to 12.2.4. Commands. 11) Clock adjustment: Refer to Check Record. (*2)
X'tal (X501)	System clock	Clock adjustment data is in EEPROM, adjust the data again after replacing it. 1) Apply 5.5V between DCP ad DCM with DC power. 2) Input Command "sendchar sfr", then you can confirm the current value. 3) Check X'tal Frequency.(10.368MHz $\pm$ 100Hz). 4)If the frequency is not 10.368MHz $\pm$ 100Hz, 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 10.368MHz $\pm$ 5Hz.

Note:

(*1) WW: country code, 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.57).

When adjust the frequency the BT Unit.

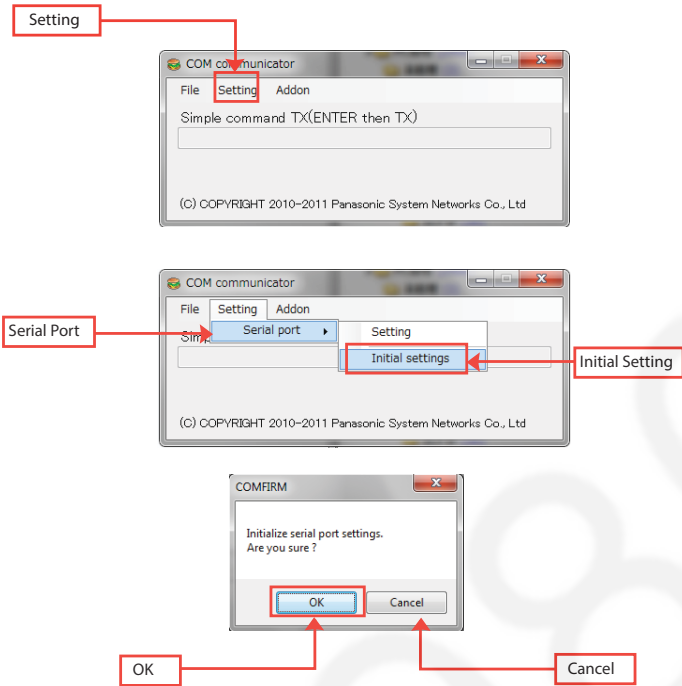
	Item	Test command		Description
		Input	Echo back	
1	Power on	-	-	Wait 10seconds and connect JIG
2	Test mode	sendchar XBT 1 ↵ sendchar #X ts ↵	OK #XXTEST	Enter"XBT 1" and then "OK" is back when it succeeds to enter test mode.
3	Confirm a default value	sendchar #X nc ↵	#XXnc=0x1A	Confirm a default value 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 $\pm$ 10kHz" by changing the value of, Test Point: ANT_BT, refer to Bottom View (P.88)

Note:

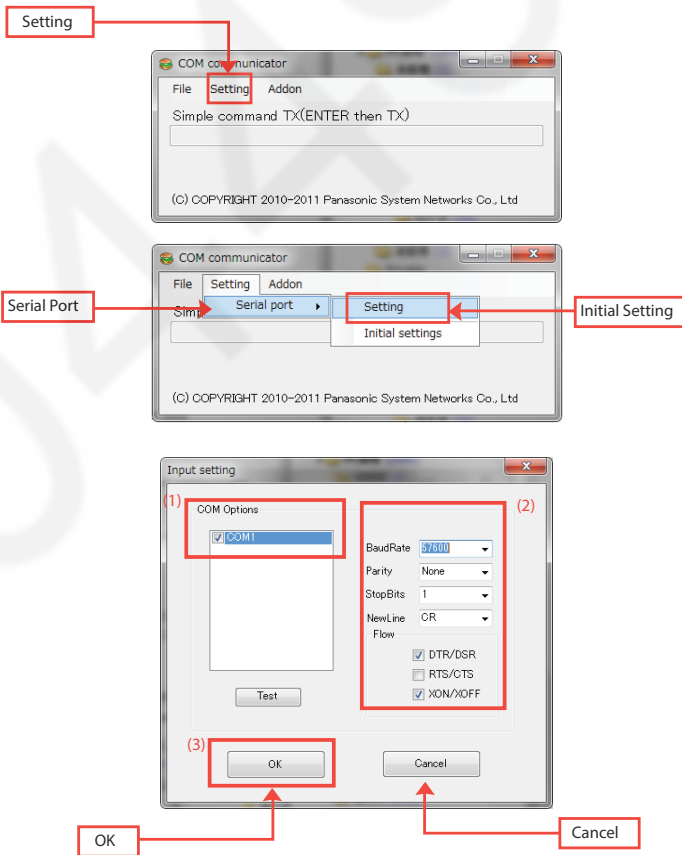
↵: Enter key

12.5.1.1.1. How to update the BBIC.

- Execute COM communicator.exe
- 1. Initialize COM port.(Only once at first.)
Select "Setting" → "Serial Port" → "Initial Setting" → "OK".

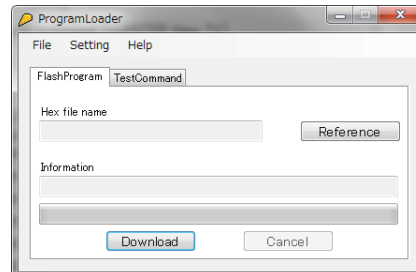
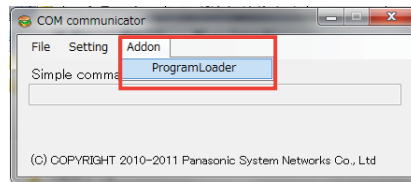


- 2.Select serial port COM number.
Select "Setting" → "Serial Port" → "Initial Setting" → "OK".
Fill up the "COM Option" → "OK".

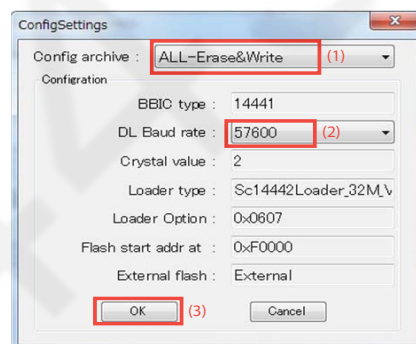
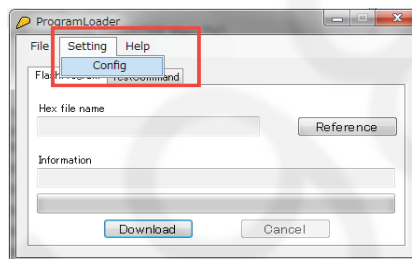


Note:
Once download is successful for a PC, this step is unnecessary next time to the PC.

- Execute COM communicator.exe again <<Write program>>
 1. Select "ProgramLoader".



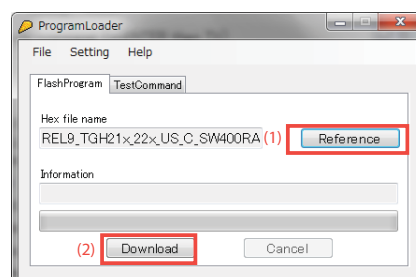
2. Select "Setting"/"Config".
Fill up the "Config Settings".



Note:

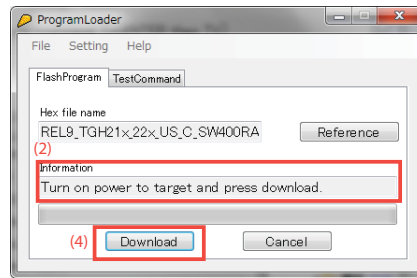
- (2) Select Baud Rate as 57600. If write error happens, select slower Baud Rate (example: 19200).

3. Select download file.



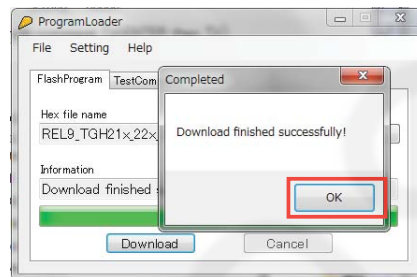
4. Start download.

- (1). Connect Unit and 3wire jig.
- (2). Confirm "Turn on power to target and press download." display.
- (3). Power off the unit, then power on.
- (4). Press "Download" button again.



5. Finish download.

Completed dialog means "Download finished successfully!." It takes more than 20 minutes to download (It depends on baud rate). If error message is displayed, proceed from step 3 again.



6. Continuous download.

Write next unit's software with proceeding from step 3 to Step 5.

12.5.1.2. Handset

First, operate the PC setting according to **The Setting Method of JIG** (P.57).

Then download the appropriate data according to the following procedures.

Items		How to download/Required adjustment
BBIC(IC1)	Programming data is stored in memory.	1) System Clock 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 "TGFA30_US_DEF_RevXXX_YYY.bat". (*1) 3) Country version batch file: Execute the command "TGFA30_US_WW_RevXXX_YYY.bat". (*1) 4) System 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.(13.824 MHz $\pm$ 100 Hz). 4) If the frequency is not 13.824 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 13.824000 MHz $\pm$ 5 Hz.

Note:

(*1) WW: country code, 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.57).

13 Miscellaneous

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

Note:

This description only applies to the model with Shield case.

13.1.1. Preparation

- PbF (: Pb free) Solder
- Soldering Iron
Tip Temperature of $700^{\circ}\text{F} \pm 20^{\circ}\text{F}$ ($370^{\circ}\text{C} \pm 10^{\circ}\text{C}$)

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.

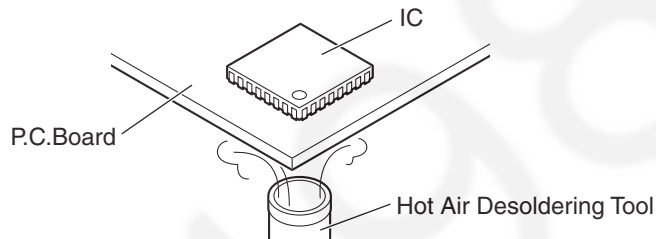
- Hot Air Desoldering Tool
Temperature: $608^{\circ}\text{F} \pm 68^{\circ}\text{F}$ ($320^{\circ}\text{C} \pm 20^{\circ}\text{C}$)

13.1.2. 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.

13.1.3. How to Remove the IC

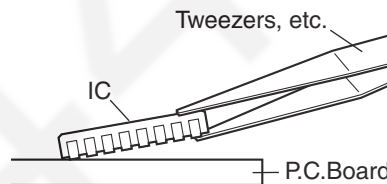
1. Heat the IC with a hot air desoldering tool through the P.C.Board.



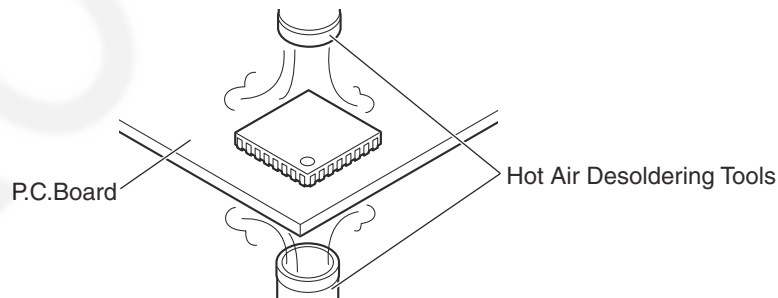
2. Pick up the IC with tweezers, etc. when the solder is melted completely.

Note:

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



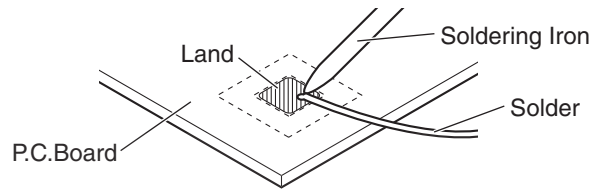
When it is hard to melt the solder completely, heat it with a hot air desoldering tool through the IC besides through the P.C.Board.



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

13.1.4. How to Install the IC

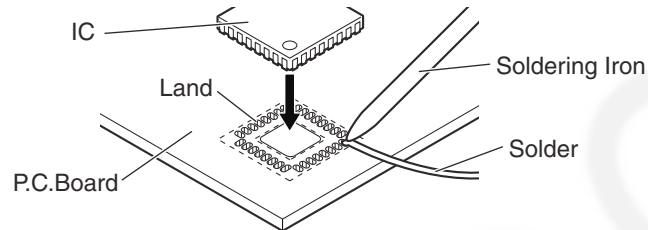
1. Place the solder a little on the land where the radiation GND pad on IC bottom is to be attached.



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

Note:

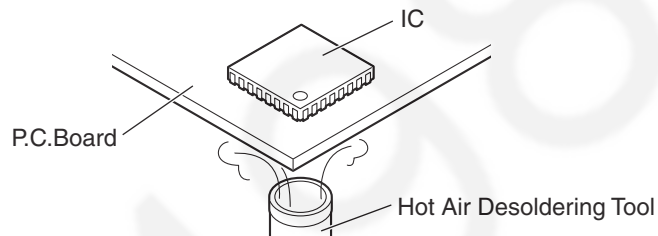
- When placing the IC, the positioning should be done very carefully.



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.

13.2. 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.

13.2.1. Preparation

- PbF (: Pb free) Solder

- Soldering Iron

Tip Temperature of $700\text{ }^{\circ}\text{F} \pm 20\text{ }^{\circ}\text{F}$ ($370\text{ }^{\circ}\text{C} \pm 10\text{ }^{\circ}\text{C}$)

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 $\rightarrow 0.82$.

Type $\rightarrow$ RMA (lower residue, non-cleaning type)

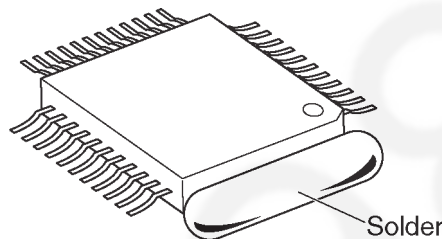
Note: See **About Lead Free Solder (PbF: Pb free)** (P.5)

13.2.2. How to Remove the IC

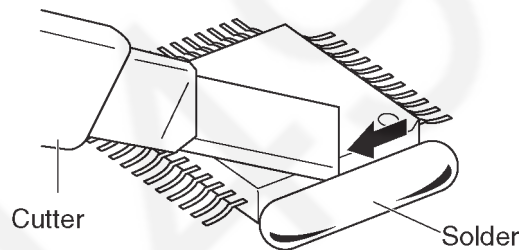
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

Note:

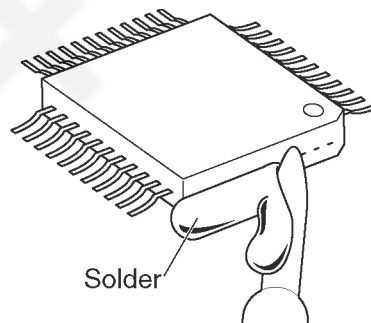
If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



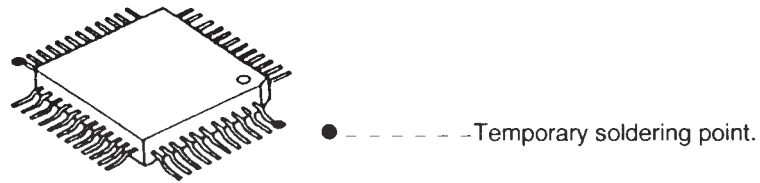
3. While the solder melts, remove it together with the IC pins.



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.

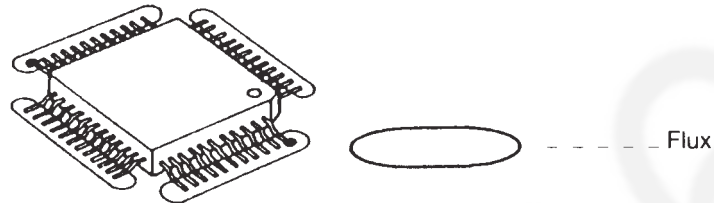
13.2.3. How to Install the IC

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

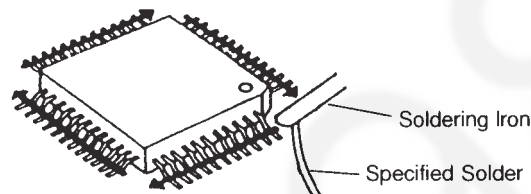


*Check the accuracy of the IC setting with the corresponding soldering foil.

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

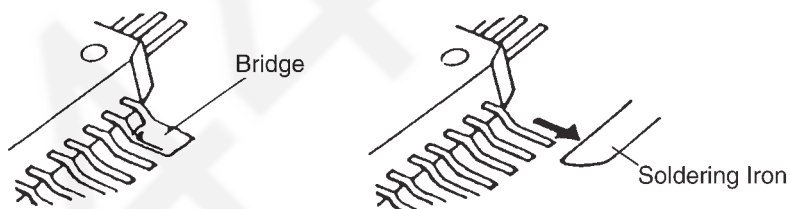


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



13.2.4. 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.



13.3. Terminal Guide of the ICs, Transistors and Diodes

13.3.1. Base Unit

 (Reverse View) 89 pin (GND) 1 88 67 66 22 23 44 45 C1CB00004266	 (Reverse View) 1 48 25 24 49 72 73 96 C1CB00003663	 5 4 8 1 PNWIATGF380H	 8 5 4 1 PNWIBTGF380H	 5 4 3 1 C0DBAYY00289 C0DBZYY00741 B1ZBZ0000086
 B C E B1ABDM000001, B1ADGE000012 DRC9113Z0L, DRC9143Z0L, 2SC6054JSL, 2SA1576S, DSA2001R0L B1GBCFYY0020, B1ABGE000011	 + ~ - B0EDER000009	 Cathode Anode DB2J31300L B0BC4R7A0268 DY2J25000L	 B C E DSC7003S0L	
 Cathode Anode B3AFB0000370	 Cathode Anode B3AAB0000347	 Cathode Anode B0DDCD000001 B0DDCL000001	 (Reverse View) Anode Cathode B3ABB0000331	 B C E B1ACGP000008
 4 3 2 1 PQVIC61CC20N	 6 4 3 1 C0DBGYY00915	 5 4 3 2 1 FM6K62010L	 Cathode Anode DB2X41400L	

13.3.2. Handset

 (Reverse View) 88 67 66 1 22 23 44 45 C2HBCY000162	 8 5 4 1 PNWITGFA30R	 6 5 4 3 2 1 C0DBZYY00357	 B C E DSA900100L DRC9113Z0L 2SC6054JSL B1ADNB000003	 B C E B1ABGE000011
 Cathode Anode B0BC4R3A0006	 (Reverse View) Cathode Anode B3AEB0000146	 Cathode Anode B3AFB0000370		

14 Schematic Diagram

14.1. For Schematic Diagram

14.1.1. Base Unit (Schematic Diagram (Base Unit_Main))

Notes:

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

Important Safety Notice:

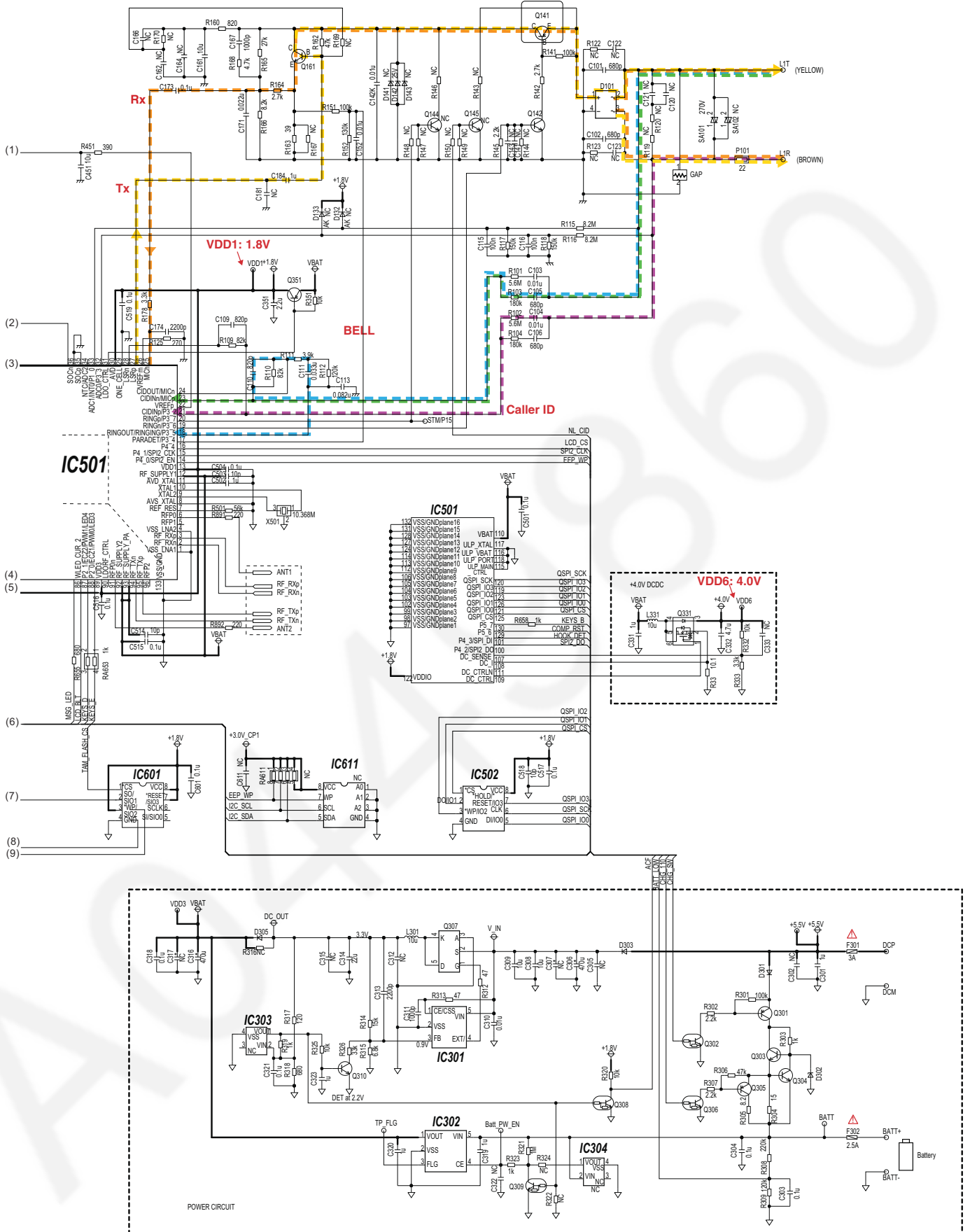
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacture's specified parts.

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

14.1.2. Handset (Schematic Diagram (Handset_Main))

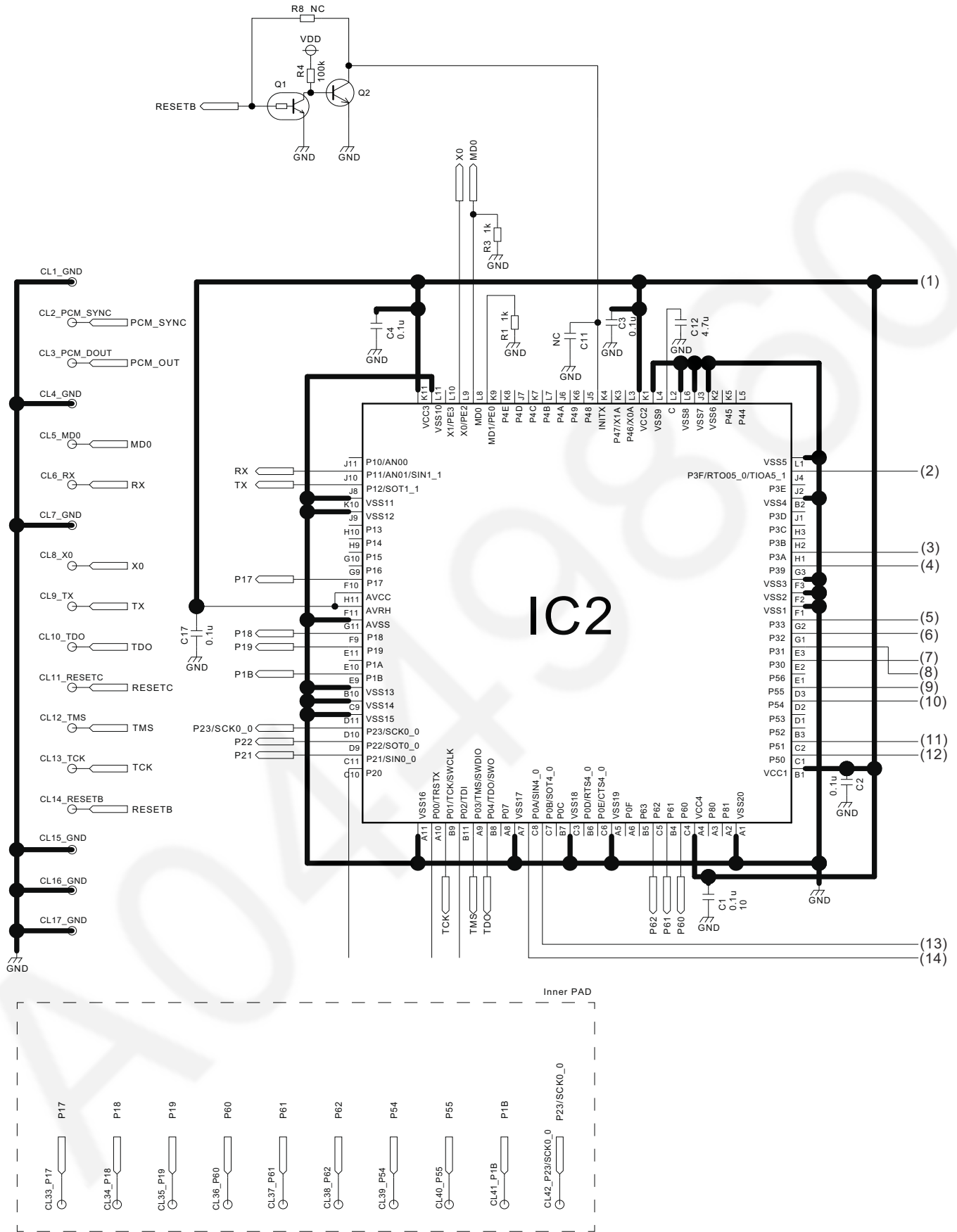
Notes:

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

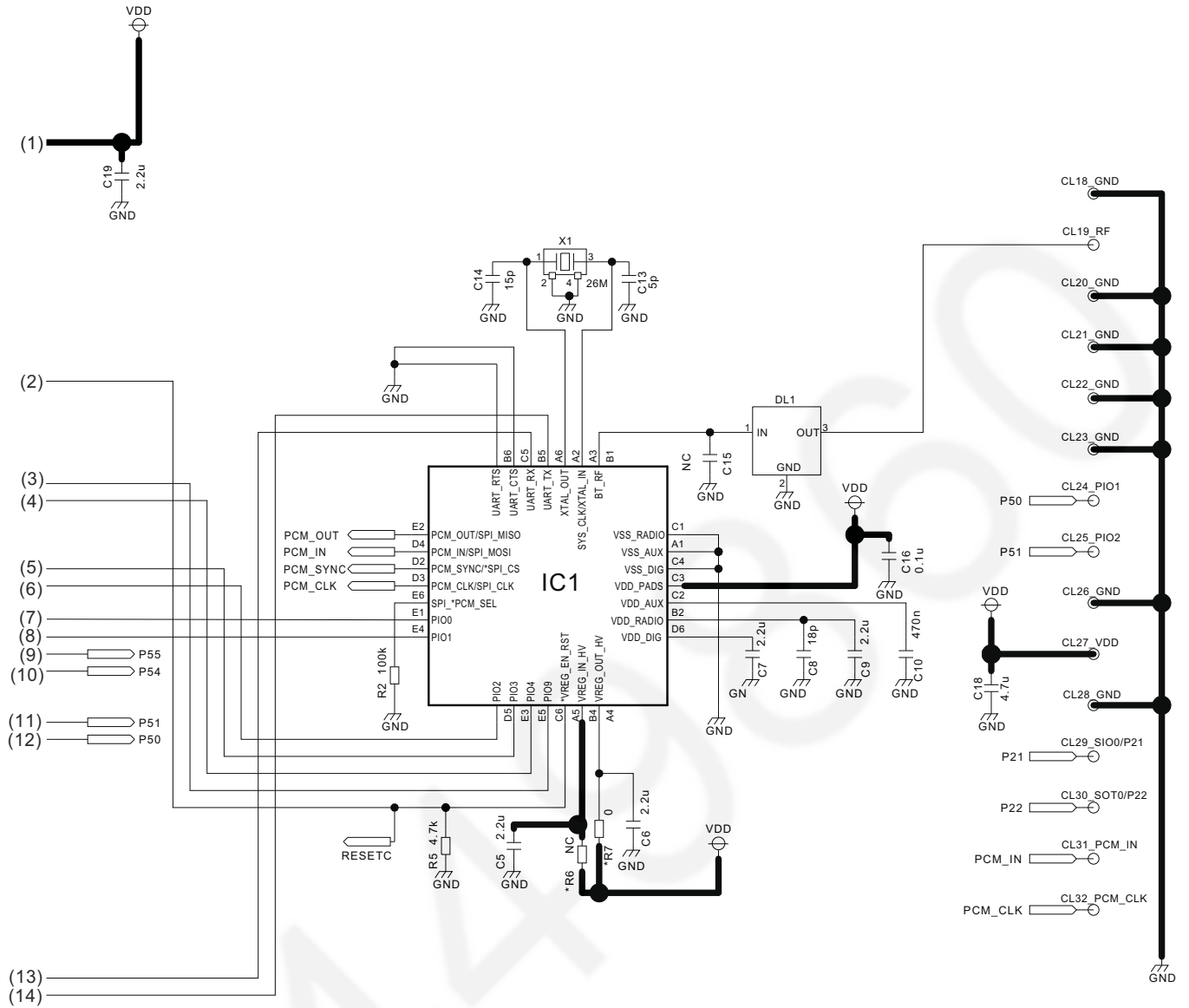


KX-TGF380AG SCHEMATIC DIAGRAM (Base Unit (Main))

14.3. Schematic Diagram (BT module)

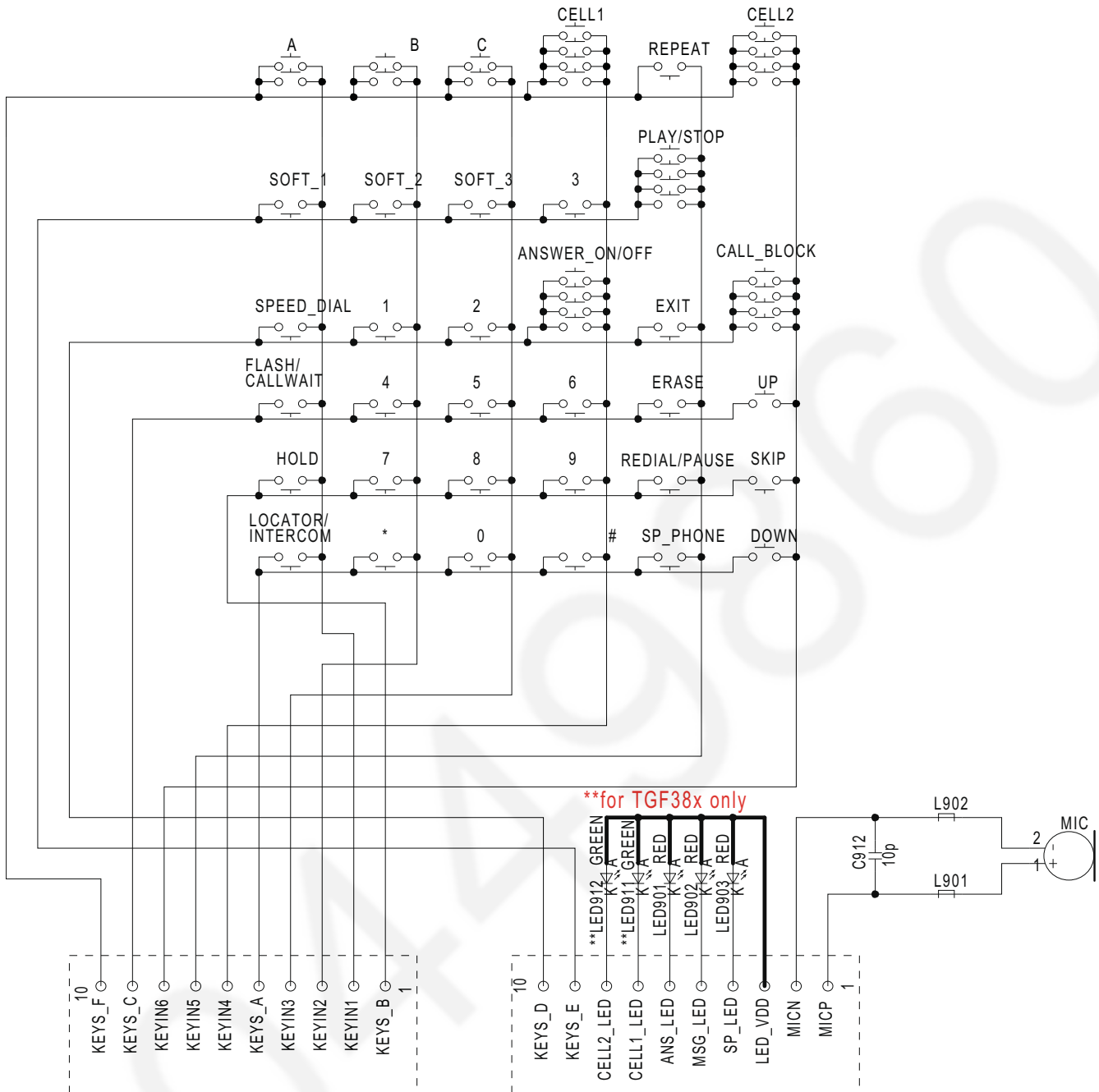


NC: No Components



KX-TGF380AG SCHEMATIC DIAGRAM (BT module)

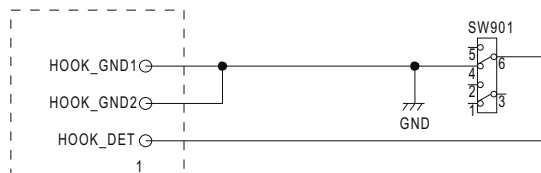
14.4. Schematic Diagram (Base Unit_Operation)



NC: No Components

KX-TGF380AG SCHEMATIC DIAGRAM(Bas Unit_Operation)

14.5. Schematic Diagram (Base Unit_Hook Switch)



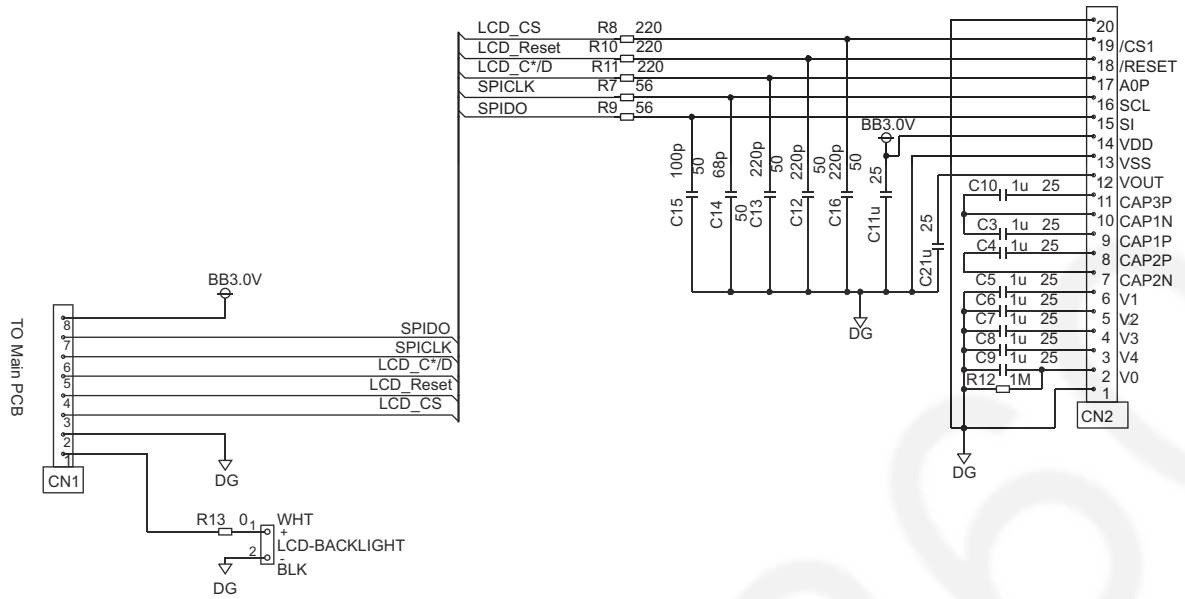
NC: No Components

KX-TGF380AG SCHEMATIC DIAGRAM(Bas Unit_Hook Switch)

Memo

A0449860

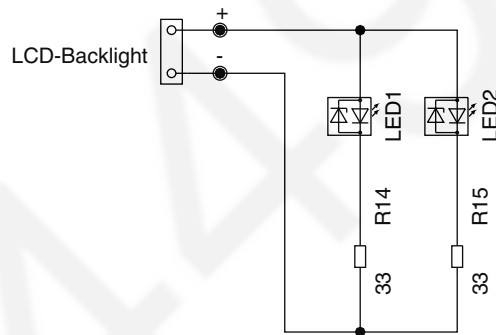
14.6. Schematic Diagram (Base Unit_LCD)



NC: No Components

KX-TGF380AG SCHEMATIC DIAGRAM(Bas Unit_LCD)

14.7. Schematic Diagram (Base Unit_LED)

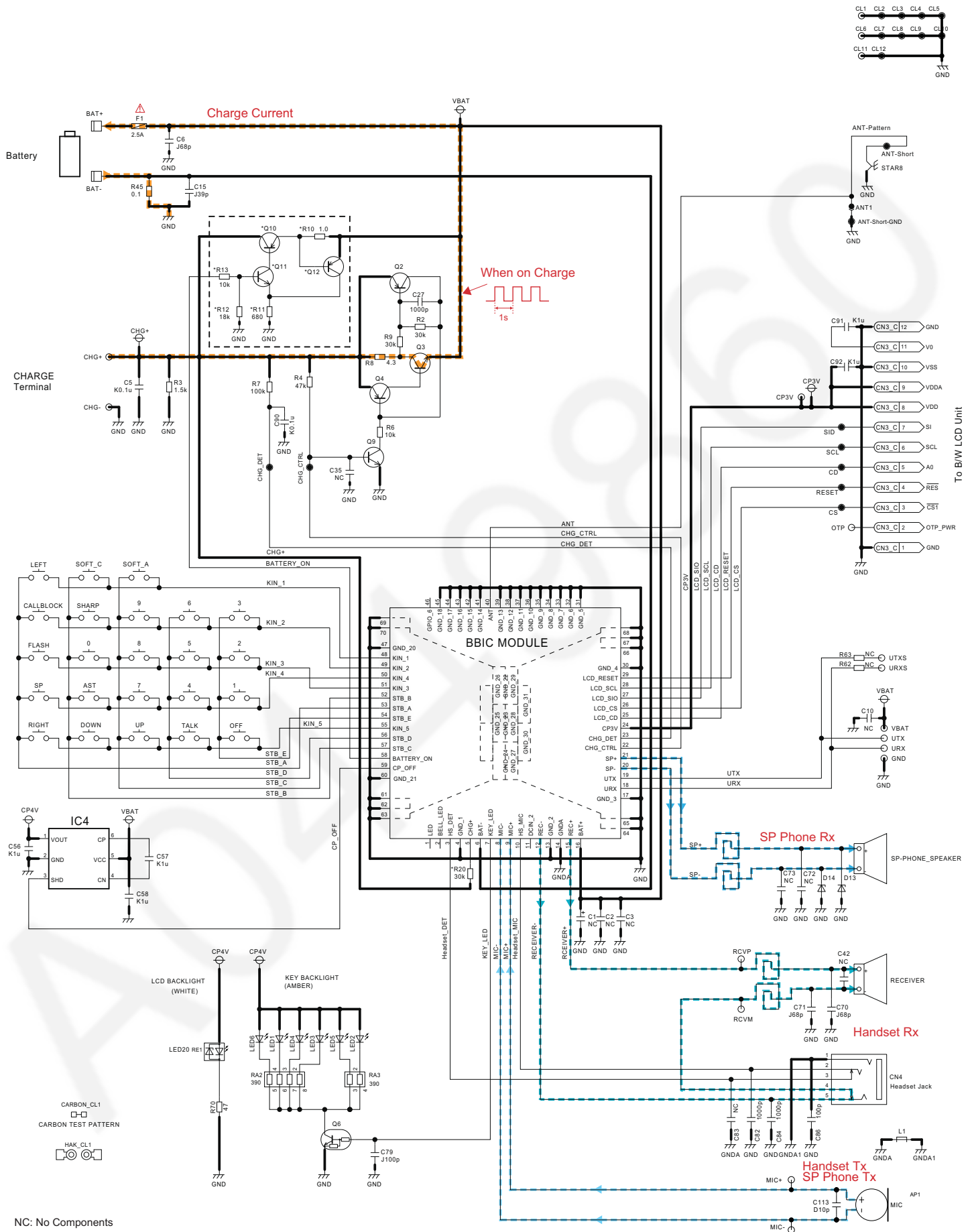


KX-TGF380AG SCHEMATIC DIAGRAM(Bas Unit_LED)

Memo

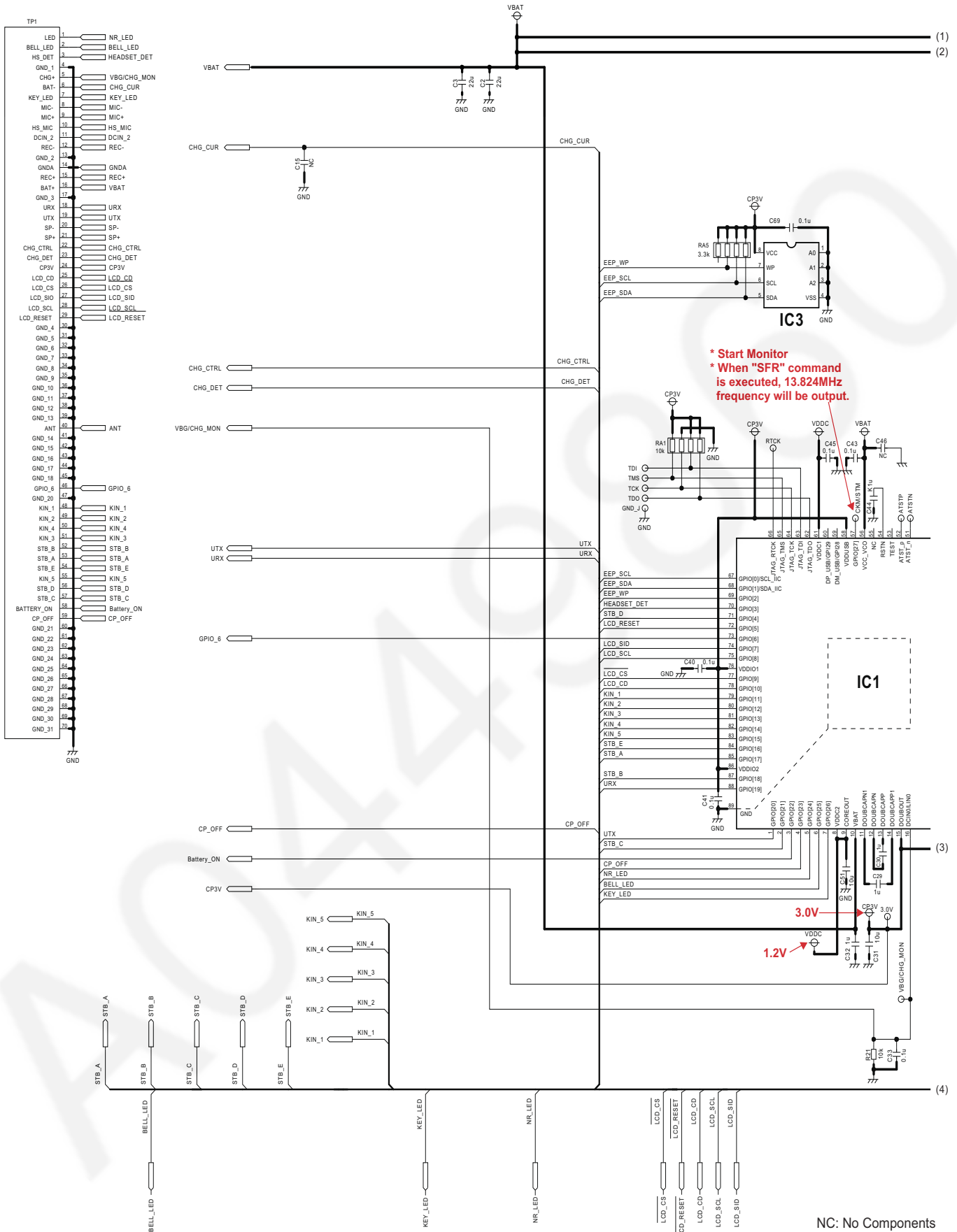
A0449860

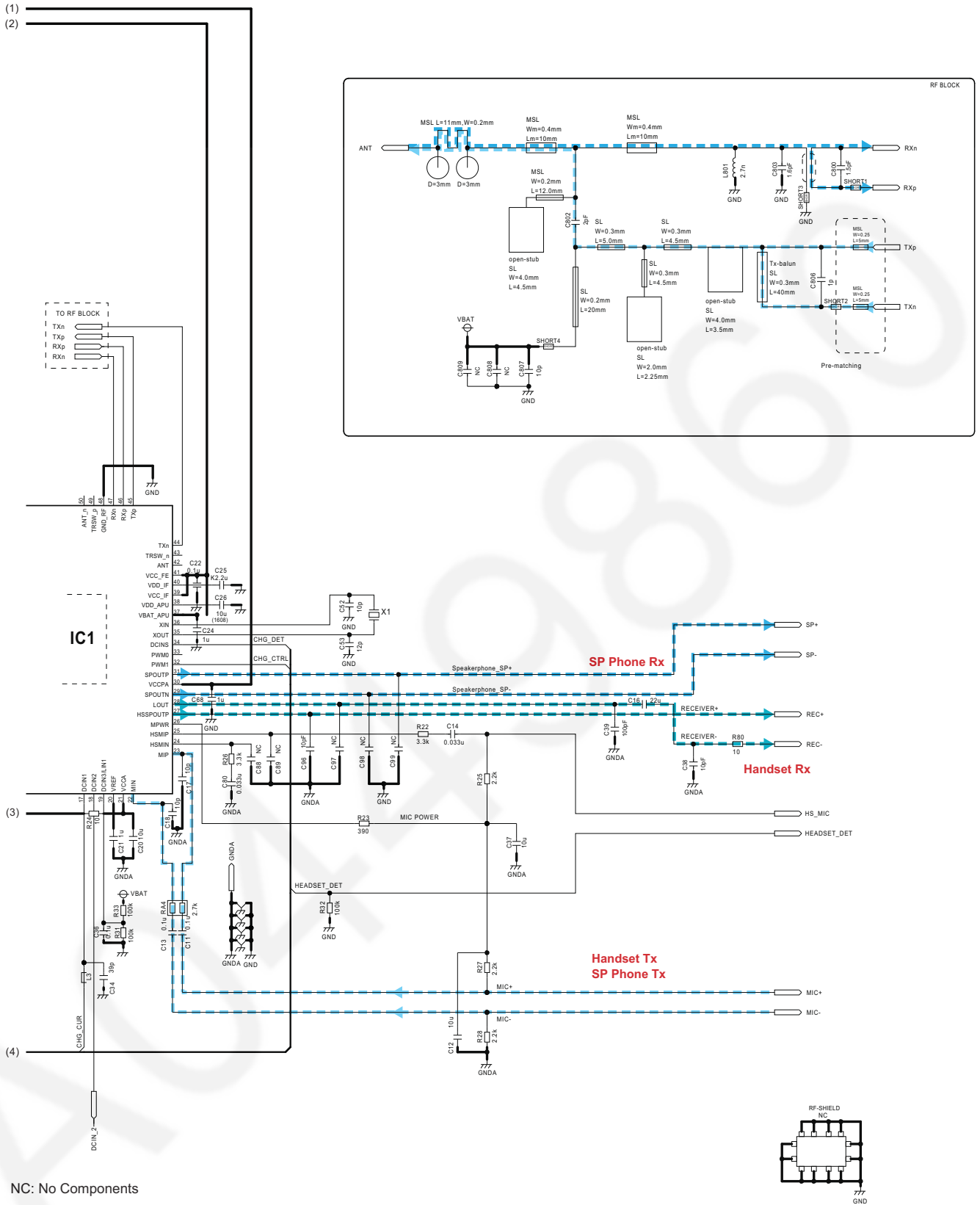
14.8. Schematic Diagram (Handset_Main)



KX-TGFA30 SCHEMATIC DIAGRAM (Handset_Main)

14.8.1. BBIC MODUL Schematic Diagram (Handset_Main)





KX-TGFA30 SCHEMATIC DIAGRAM(Handset_Main)

Memo

A0449860

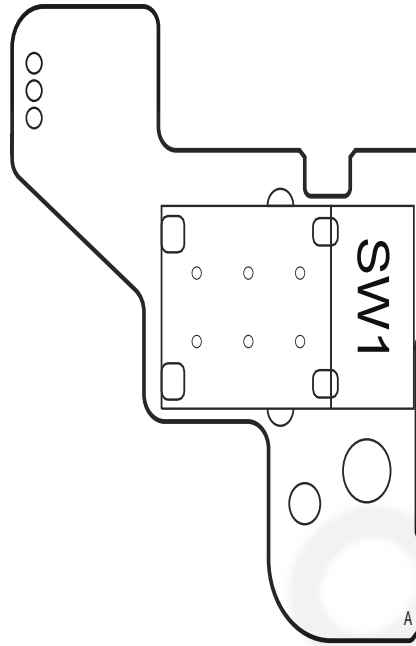
15.2. Circuit Board (Base Unit_Operation)



KX-TGF380 CIRCUIT BOARD (Base Unit_Operation (Component View))

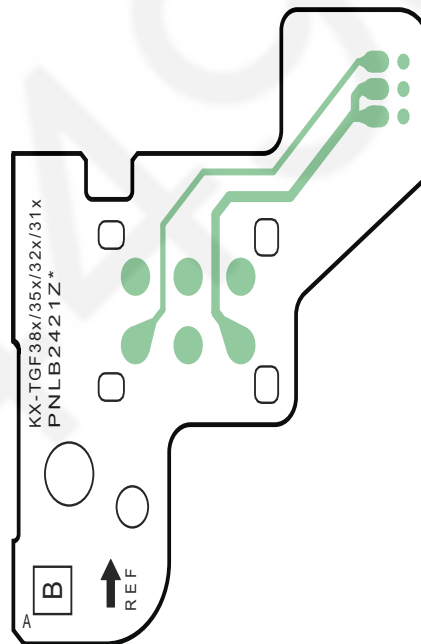
15.3. Circuit Board (Base Unit_Operation_Hook Switch)

15.3.1. Component View



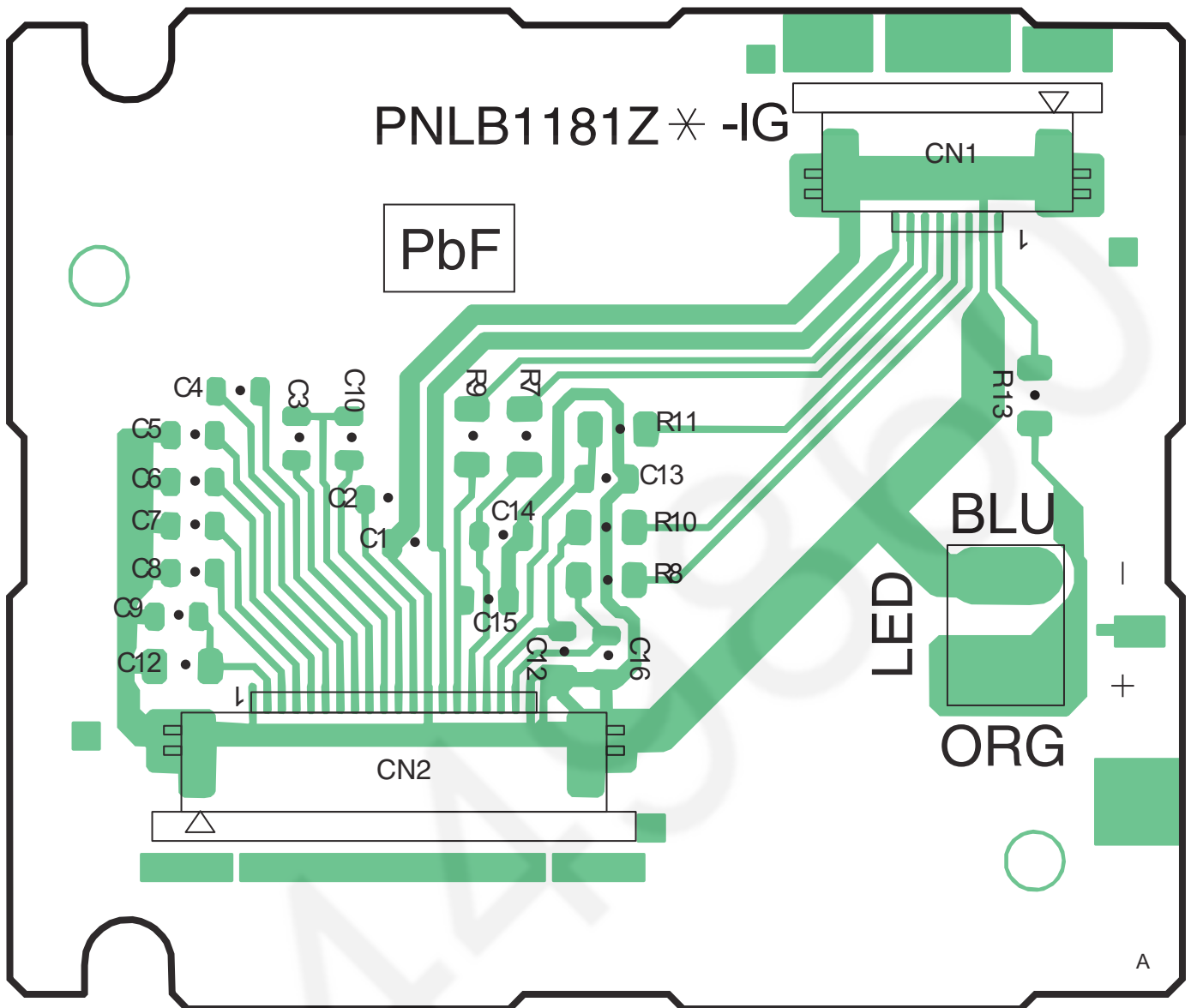
KX-TGF380 CIRCUIT BOARD (Base Unit_Operation_Hook Switch(Component View))

15.3.2. Bottom View



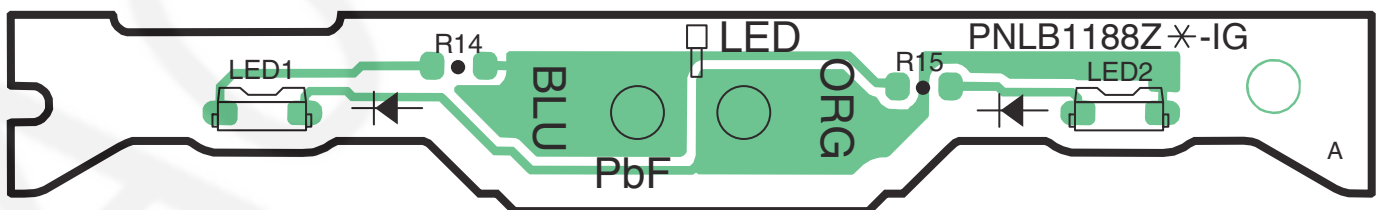
KX-TGF380 CIRCUIT BOARD (Base Unit_Operation_Hook Switch (Bottom View))

15.4. Circuit Board (Base Unit_LCD)



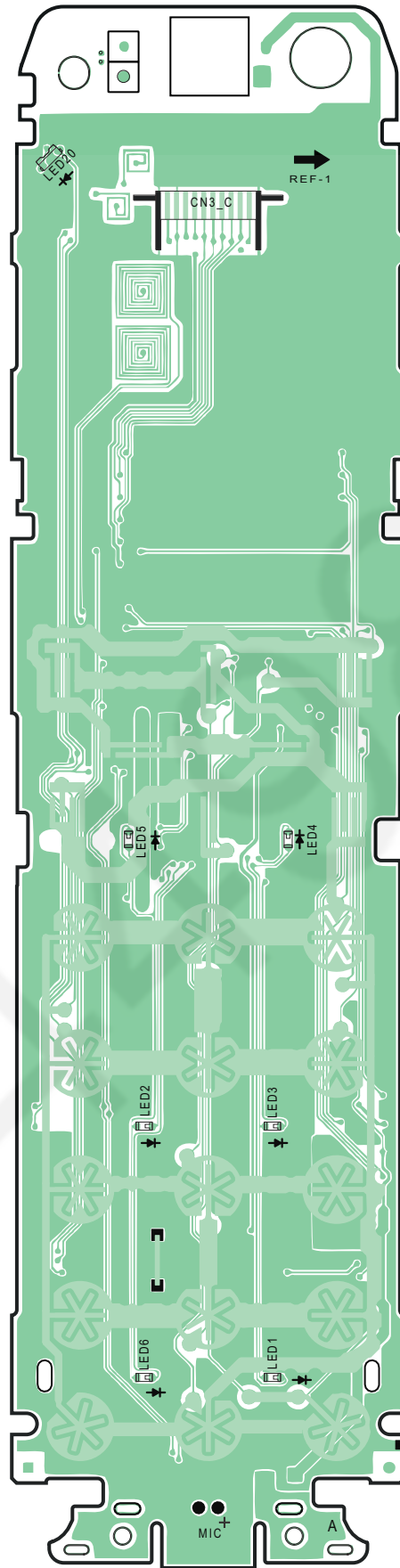
KX-TGF380 CIRCUIT BOARD (Base Unit_LCD (Component View))

15.5. Circuit Board (Base Unit_LED)



KX-TGF380 CIRCUIT BOARD (Base Unit_LED (Component View))

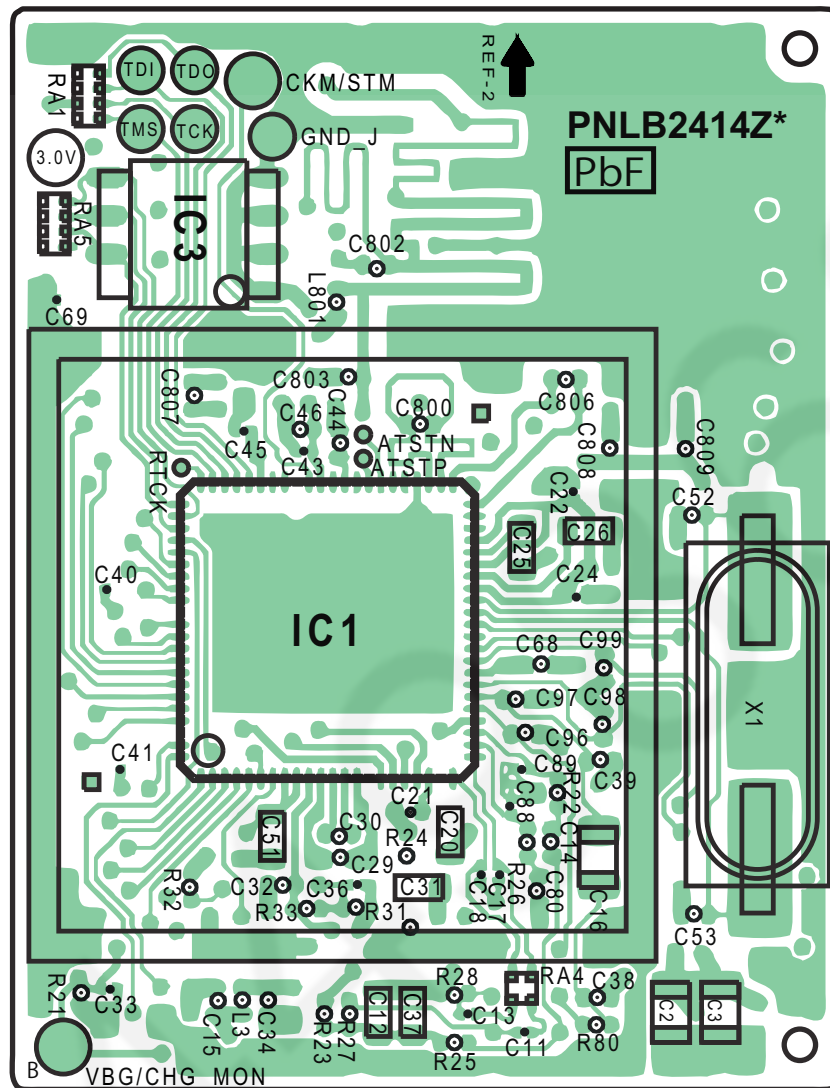
15.6.2. Bottom View



KX-TGFA30 CIRCUIT BOARD (Handset_Main (Bottom View))

15.7. Circuit Board (Handset_BBIC Module)

15.7.1. Component View

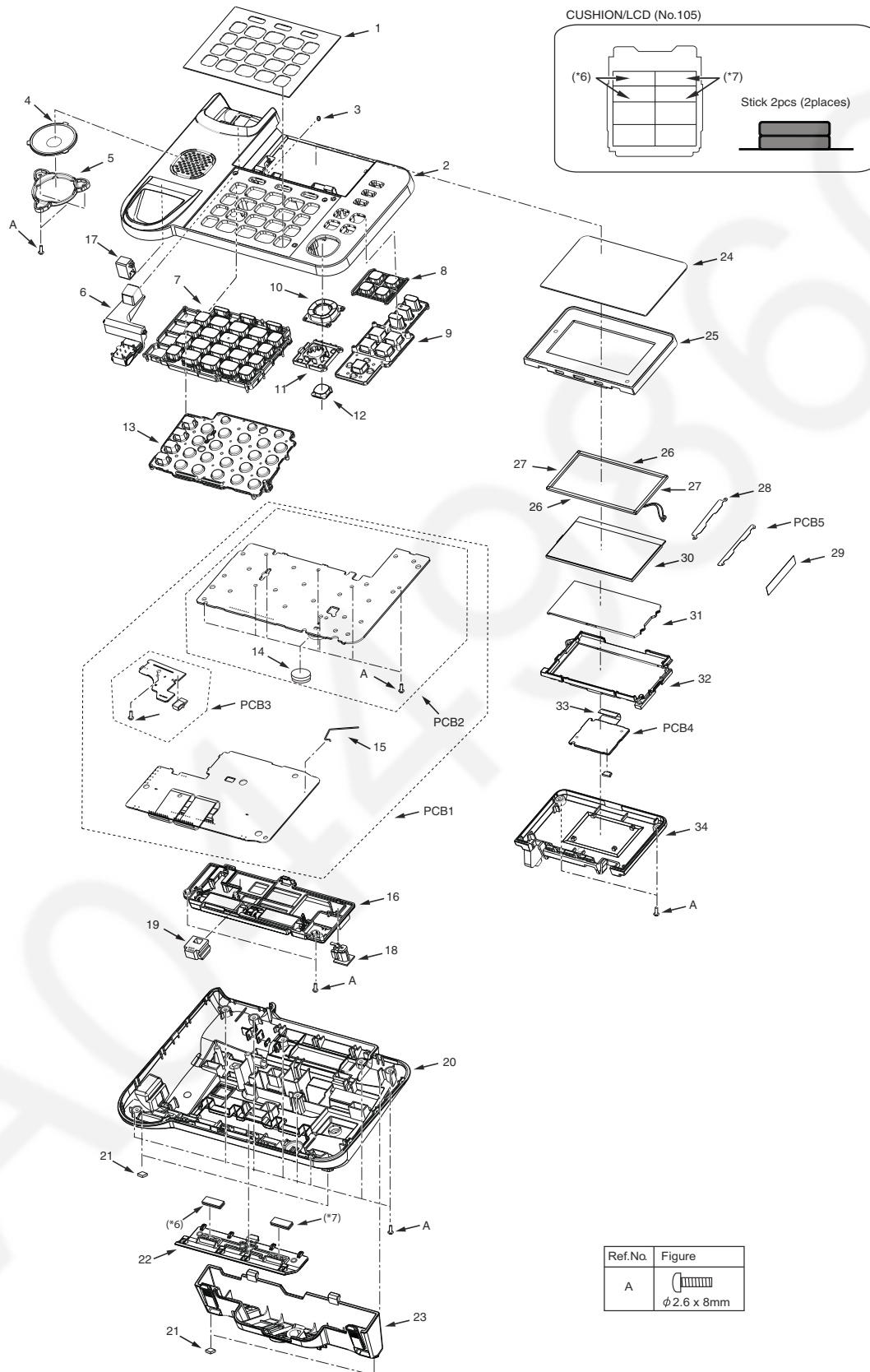


KX-TGFA30 CIRCUIT BOARD (Handset_BBIC Module (Component View))

16 Exploded View and Replacement Parts List

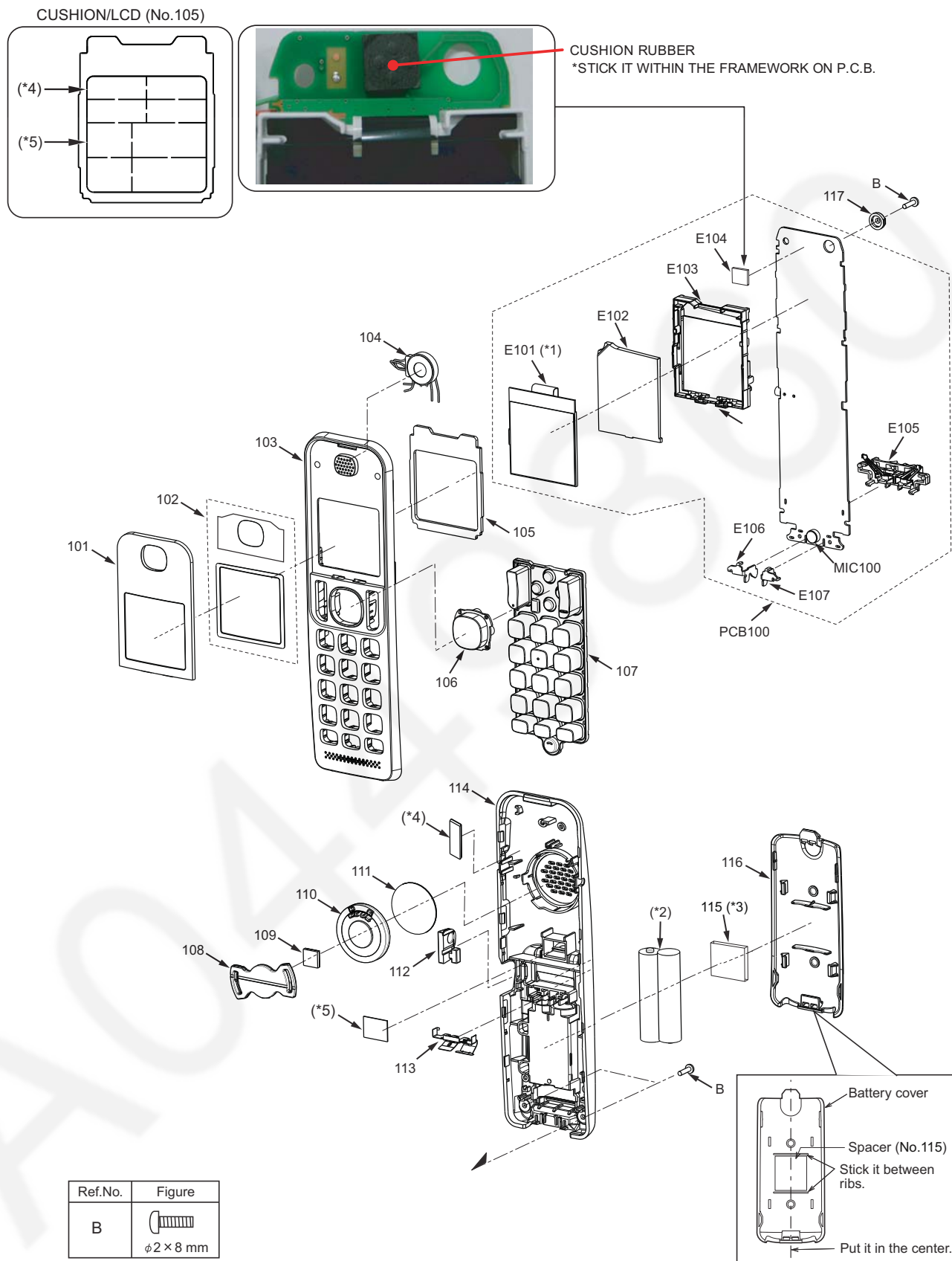
16.1. Cabinet and Electrical Parts (Base Unit)

16.1.1. KX-TGF380



Note:
 (*6)(*7) This SPACER is cut from the excess parts of CUSHION/LCD (No.24). Refer to Cabinet and Electrical Parts (Base Unit)(P.98).

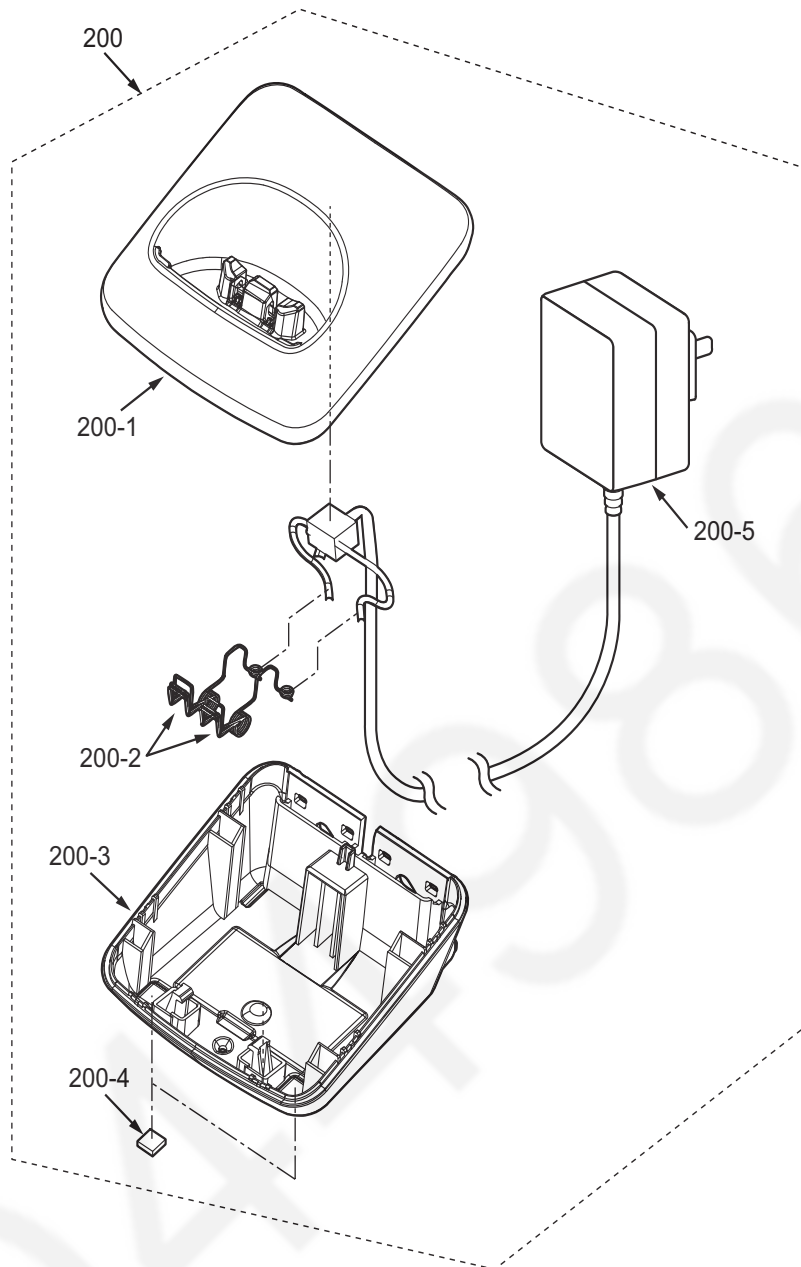
16.2. Cabinet and Electrical Parts (Handset)



Note:

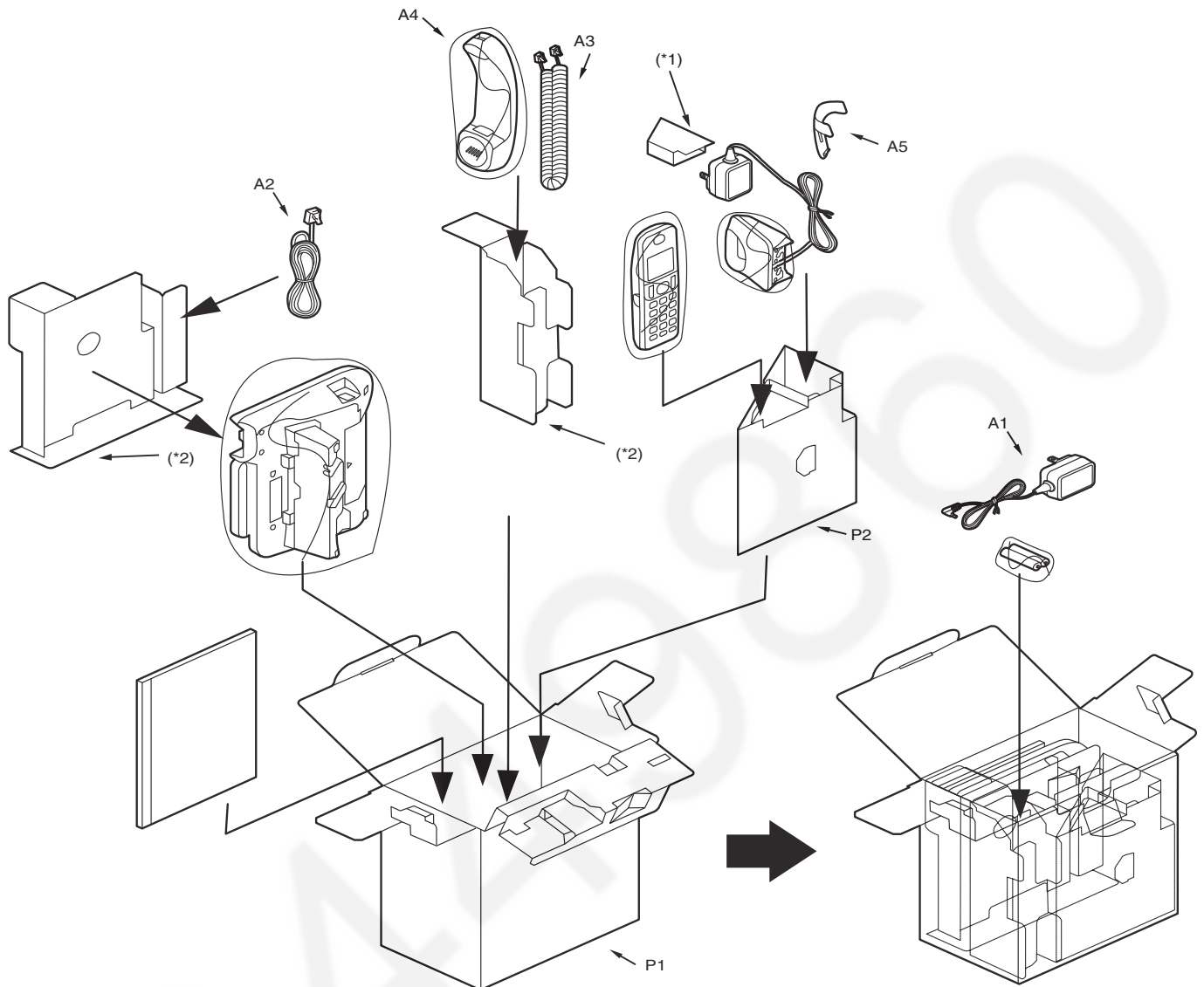
- (*1) This cable is fixed by heat-sealing. Refer to **How to Replace the Handset LCD (P.56)**.
- (*2) The rechargeable Ni-MH Panasonic battery is available through sales route of Panasonic.
- (*3) Attach the SPACER (No. 115) to the exact location described above.
- (*4)(*5) This SPACER is cut from the excess parts of CUSHION/LCD (No.105).

16.3. Cabinet and Electrical Parts (Charger Unit)



16.4. Accessories and Packing Materials

16.4.1. KX-TGF380AGM



Note:

(*1) This pad is a piece of Ref No.P1(Gift Box). This pad is for AC Adaptor.

(*2) These pad is a piece of Ref No.P2 (Pad).

16.5. 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  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 EQS: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	

16.5.1. Base Unit

16.5.1.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	1	PNGP1362Z1	PANEL, UPPER	PC-V2
	2	PNKM1606Z1	CABINET BODY	PS-HB
	3	PNHG1106Z	SPACER, RUBBER RING	
	4	L0AA04A00028	SPEAKER	
	5	PQHR11082Z	GUIDE, SPEAKER	POM-HB
	6	PNBH1026Z1	BUTTON, HOOK	
	7	PNBX1362T1	BUTTON, KEY DIAL	
	8	PNBX1361Y1	BUTTON, PLAY STOP KEY	ABS-HB
	9	PNJK1248Z	KEYBOARD SWITCH, TAM	
	10	PNBC1486Y2	BUTTON, NAVIGATOR KEY	ABS-HB
	11	PNBC1345N1	BUTTON, MESSAGE	PMMA-HB
	12	PNHR1760Z	GUIDE, BUTTON	PS-HB

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	13	PNJK1199Y	KEYBOARD SWITCH, DIAL	
	14	PQMG10025W	RUBBER PART, MIC	
	15	PNLA1138Z	ANTENNA	
	16	PNVE1026Z	BATTERY TERMINAL W/C	
	17	PQJJ1T030N	JACK, HANDSET	
	18	K2ECYZ000002	JACK, DC	
	19	PQJJ1T039K	JACK, MODULAR	
	20	PNKF1370Y1	CABINET COVER	PS-HB
	21	PNHA1013Z	RUBBER PARTS, FOOT CUSHION	
	22	PNKK1108Z1	LID, BATTERY	PS-HB
	23	PNKL1051Z1	STAND, WALL MOUNT	ABS-HB
	24	PNGP1304Z1	PANEL, LCD	PC-V2
	25	PNGG1350Y2	GRILLE, LCD	PS-HB
	26	PNHS1528Z	SPACER, LCD (LONG)	
	27	PNHS1529Z	SPACER, LCD (SHORT)	
	28	PNHX1689Y	COVER, REFLECTOR SHEET	
	29	PNHX1502Z	SHEET, LCD	
	30	L5DYBYY00076	LIQUID CRYSTAL DISPLAY	
	31	PNHR1858Z	PLATE, LCD	PMMA-HB
	32	PNHR1857Z	GUIDE, LCD	ABS-HB
	33	PNJE1121Z	LEAD WIRE, FFC	
	34	PNKV1229Z1	COVER, LCD	PS-HB

16.5.1.2. Main P.C. Board Parts

Note:

(*1) When replacing IC502, IC601 or X501, make the adjustment using PNZZTGF380AG. Refer to **How to download the data** (P.63) of Things to Do after Replacing IC or X'tal

(*2) When replacing IC501 or IC721, Refer to **How to Replace the LLP (Leadless Leadframe Package) IC** (P.68)

16.5.1.2.1. KX-TGF380

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB1	PNWPAF380AGH	MAIN P.C.BOARD ASS'Y (RTL)	
			(IC'S)	
	IC301	C0DBAYY00289	IC	
	IC302	C0DBZYY00741	IC	
	IC303	PQVIC61CC20N	IC	S
	IC421	C1CB00004266	IC	
	IC501	C1CB00003663	IC (*2)	
	IC502	PNWIATGF380H	IC (*1)	
	IC601	PNWIATGF380H	IC (*1)	
	IC722	C0DBGYY00915	IC	
			(BT UNIT)	
	IC721	PNWPETGF380H	BT UNIT (*2)	
			(TRANSISTORS)	
	Q141	B1ACGP000008	TRANSISTOR(SI)	
	Q142	B1ABDM000001	TRANSISTOR(SI)	S
	Q161	DSC7003S0L	TRANSISTOR(SI)	
	Q301	B1ADGE000012	TRANSISTOR(SI)	
	Q302	DRC9143Z0L	TRANSISTOR(SI)	
	Q303	B1ABGE000011	TRANSISTOR(SI)	
	Q304	2SC6054JSL	TRANSISTOR(SI)	S
	Q305	B1ADGE000012	TRANSISTOR(SI)	
	Q306	DRC9143Z0L	TRANSISTOR(SI)	
	Q307	B1ZBZ0000086	TRANSISTOR(SI)	
	Q308	DRC9143Z0L	TRANSISTOR(SI)	
	Q309	DRC9143Z0L	TRANSISTOR(SI)	
	Q310	2SC6054JSL	TRANSISTOR(SI)	S
	Q331	FM6K62010L	TRANSISTOR(SI)	
	Q351	B1ADGE000012	TRANSISTOR(SI)	
	Q651	DRC9113Z0L	TRANSISTOR(SI)	
	Q652	DRC9113Z0L	TRANSISTOR(SI)	
	Q653	DRC9113Z0L	TRANSISTOR(SI)	
	Q681	DSA2001R0L	TRANSISTOR(SI)	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	Q731	2SC6054JSL	TRANSISTOR(SI)	S
	Q732	2SC6054JSL	TRANSISTOR(SI)	S
			(DIODES)	
	D101	B0EDER000009	DIODE(SI)	S
	D142	DY2J25000L	TRANSISTOR(SI)	
	D301	DB2J31300L	DIODE(SI)	
	D302	B0BC4R7A0268	DIODE(SI)	S
	D303	DB2X41400L	DIODE(SI)	
	D305	DB2X41400L	DIODE(SI)	
	DA802	B0DDCL000001	DIODE(SI)	
			(COILS)	
	L301	G1C100MA0395	COIL	
	L331	G1C100MA0395	COIL	
	L431	PQLQR2KA20T	COIL	S
	L432	PQLQR2KA20T	COIL	S
	L433	PQLQR2KA20T	COIL	S
	L434	PQLQR2KA20T	COIL	S
	L781	G1C4N7Z00006	COIL	
			(RESISTOR ARRAYS)	
	RA431	EXB24V222J	RESISTOR ARRAY	
	RA432	EXB24V222J	RESISTOR ARRAY	
	RA451	EXB24V222J	RESISTOR ARRAY	
	RA452	EXB24V272J	RESISTOR ARRAY	
	RA501	EXB24V221JX	RESISTOR ARRAY	
	RA651	D1H810240004	RESISTOR ARRAY	S
	RA652	D1H810240004	RESISTOR ARRAY	S
	RA653	EXB24V102JX	RESISTOR ARRAY	
	RA671	D1H810240004	RESISTOR ARRAY	S
			(VARISTOR)	
	SA101	J0LE00000047	VARISTOR	
			(CONNECTORS)	
	CN671	K1MY08BA0672	CONNECTOR	
			(RESISTORS)	
	R101	ERJ3GEYJ565	5.6M	S
	R102	ERJ3GEYJ565	5.6M	S
	R103	PQ4R10XJ184	180k	S
	R104	PQ4R10XJ184	180k	S
	R109	ERJ2GEJ823	82k	S
	R110	ERJ2GEJ823	82k	S
	R111	D0GA392JA015	3.9k	S
	R112	D0GA124JA015	120k	S
	R115	ERJ3GEYJ825	8.2M	S
	R116	ERJ3GEYJ825	8.2M	S
	R117	ERJ3GEYJ154	150k	S
	R118	ERJ3GEYJ154	150k	S
	R125	ERJ2GEJ271	270	S
	R141	ERJ3GEYJ104	100k	S
	R142	PQ4R18XJ272	2.7	S
	R145	ERJ2GEJ222	2.2k	S
	R151	D0GA104JA021	100k	S
	R152	ERJ2GEJ134X	130k	S
	R160	ERJ3GEYJ821	820	S
	R162	ERJ2GEJ273X	27k	S
	R163	D0GG390JA007	39	
	R164	ERJ2GEJ272	2.7k	S
	R165	ERJ3GEYJ273	27k	S
	R166	ERJ3GEYJ822	8.2k	S
	R168	ERJ2GEJ472X	4.7k	S
	R178	D0GA332JA015	3.3k	S
	R301	D0GA104JA021	100k	S
	R302	ERJ2GEJ222	2.2k	S
	R303	ERJ3GEYJ102	1k	S
	R304	ERJ3GEYJ150	15	S
	R305	ERJ3GEYJ8R2	8.2	S
	R306	ERJ2GEJ473	47k	S
	R307	ERJ2GEJ222	2.2k	S
	R308	ERJ2RKF2203X	220k	S
	R309	ERJ2RKF1203	120k	
	R312	ERJ2GEJ470	47	S
	R313	ERJ2GEJ470	47	S
	R314	ERJ2RKF1502	15k	
	R315	ERJ2RKF6801	6.8k	
	R317	ERJ2RKF1200	120	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R318	ERJ2RKF6800	680	
	R319	ERJ2RKF1001	1k	
	R320	ERJ2GEJ103	10k	S
	R321	ERJ2GEJ105X	1M	S
	R323	ERJ2GEJ102	1k	S
	R325	ERJ2GEJ103	10k	S
	R326	ERJ2GEJ333	33k	S
	R331	D0GBR10JA113	0.1	
	R332	ERJ2RKF1002	10k	
	R333	ERJ2RKF3301	3.3k	
	R351	ERJ2GEJ103	10k	S
	R421	D0GA104JA021	100k	S
	R422	ERJ2GE0R00	0	S
	R433	ERJ2GEJ101	100	S
	R451	ERJ2GEJ391	390	S
	R477	ERJ2GEJ1R0	1	S
	R478	ERJ2GEJ1R0	1	S
	R501	ERJ2RKF5602	56k	S
	R502	D0GA332JA015	3.3k	S
	R504	ERJ2GEJ100	10	S
	R505	ERJ2GEJ102	1k	S
	R551	ERJ2GEJ102	1k	S
	R651	ERJ2GEJ101	100	S
	R652	ERJ2GEJ101	100	S
	R653	ERJ2GEJ391	390	S
	R654	D0GA681JA021	680	S
	R655	D0GA681JA021	680	S
	R656	ERJ2GEJ473	47k	S
	R657	ERJ2GEJ102	1k	S
	R658	ERJ2GEJ102	1k	S
	R660	ERJ2GEJ473	47k	S
	R661	ERJ2GEJ102	1k	S
	R671	ERJ2GEJ103	10k	S
	R672	D0GA561JA021	560	S
	R681	D0GA104JA021	100k	S
	R682	D0GA561JA021	560	S
	R731	D0GA104JA021	100k	S
	R732	ERJ2GEJ224	220k	S
	R733	D0GA104JA021	100k	S
	R734	ERJ2GEJ224	220k	S
	R735	ERJ2GEJ223	22k	S
	R891	ERJ2GEJ221	220	S
	R892	ERJ2GEJ221	220	S
			(CAPACITORS)	
	C101	F1K2H681A008	CERAMIC CAPACITOR	S
	C102	F1K2H681A008	CERAMIC CAPACITOR	S
	C103	ECUV1H103KBV	0.01	
	C104	ECUV1H103KBV	0.01	
	C105	F1K2H681A008	CERAMIC CAPACITOR	S
	C106	F1K2H681A008	CERAMIC CAPACITOR	S
	C109	ECUE1H821KBQ	820p	
	C110	ECUE1H821KBQ	820p	
	C111	ECUE1A333KBQ	0.033	
	C113	ECUE1A823KBQ	0.082	
	C115	ECUV1C104KBV	0.1	
	C116	ECUV1C104KBV	0.1	
	C142	ECUV1H103KBV	0.01	
	C152	ECUE1C103KBQ	0.01	
	C161	F1K1E1060001	CERAMIC CAPACITOR	
	C167	ECUV1H102KBV	0.001	
	C171	ECUV1C223KBV	0.022	
	C173	ECUE1A104KBQ	0.1	
	C174	ECUE1H222KBQ	0.0022	
	C184	ECUV1C105KBV	1	
	C301	ECUV1C105KBV	1	
	C303	ECUE1A104KBQ	0.1	
	C304	ECUE1A104KBQ	0.1	
	C306	F2G1A4710013	470	
	C308	F1J1C106A059	CERAMIC CAPACITOR	
	C309	F1J1C106A059	CERAMIC CAPACITOR	
	C310	ECUE1C103KBQ	0.01	
	C311	ECUE1H102KBQ	0.001	
	C313	ECUE1H222KBQ	0.0022	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C314	F1J0J2260004	CERAMIC CAPACITOR	
	C316	F2G1A4710013	470	
	C318	ECUE1A104KBQ	0.1	
	C319	ECUE0J105KBQ	1	
	C320	ECUE0J105KBQ	1	
	C321	ECUE1A104KBQ	0.1	
	C323	ECUE0J105KBQ	1	
	C331	ECUV0J105KBV	1	
	C332	F1H0J4750002	CERAMIC CAPACITOR	
	C351	ECUV1A225KBV	2.2	
	C421	ECUE1A104KBQ	0.1	
	C422	ECUE1A104KBQ	0.1	
	C423	ECUE1A104KBQ	0.1	
	C424	ECUE1A104KBQ	0.1	
	C425	ECUE1H102KBQ	0.001	
	C435	ECUE1H222KBQ	0.0022	
	C436	ECUE1H681KBQ	680p	
	C437	ECUE1H681KBQ	680p	
	C438	ECUE1H222KBQ	0.0022	
	C440	ECUE1H102KBQ	0.001	
	C441	PQCUV0J106KB	10	
	C442	ECUE1A104KBQ	0.1	
	C443	ECUE1A104KBQ	0.1	
	C444	ECUE1H331KBQ	330p	
	C445	ECUE1A104KBQ	0.1	
	C451	PQCUV0J106KB	10	
	C457	ECUE1C333KBQ	0.033	
	C458	ECUE1C333KBQ	0.033	
	C459	ECUE1H102KBQ	0.001	
	C472	ECUE1H100DCQ	10p	
	C473	ECUE1H100DCQ	10p	
	C477	ECUE1H222KBQ	0.0022	
	C478	ECUE1H222KBQ	0.0022	
	C501	ECUE1A104KBQ	0.1	
	C502	ECUE0J105KBQ	1	
	C503	ECUE1H100DCQ	10p	
	C504	ECUE1A104KBQ	0.1	
	C505	ECUE1A104KBQ	0.1	
	C506	ECUV0J225KBV	2.2	
	C508	ECUE0J105KBQ	1	
	C509	ECUV1C105KBV	1	
	C511	ECUE1H100DCQ	10p	
	C512	ECUE0J105KBQ	1	
	C513	ECUE1A104KBQ	0.1	
	C514	ECUE1H100DCQ	10p	
	C515	ECUE1A104KBQ	0.1	
	C516	ECUE1A104KBQ	0.1	
	C517	ECUE1A104KBQ	0.1	
	C518	ECUE1H100DCQ	10p	
	C519	ECUE1A104KBQ	0.1	
	C601	ECUE1A104KBQ	0.1	
	C721	ECUE1A104KBQ	0.1	
	C722	ECUE0J105KBQ	1	
	C723	ECUE0J105KBQ	1	
	C671	ECUE1A104KBQ	0.1	
	C851	ECUE1H100DCQ	10p	
	C853	ECUE1H100DCQ	10p	
	C855	ECUE1H100DCQ	10p	
	C857	ECUE1H100DCQ	10p	
	C859	ECUE1H100DCQ	10p	
	C860	F1G1HR70A765	CERAMIC CAPACITOR	
	C862	F1G1H2R2A765	CERAMIC CAPACITOR	
	C880	F1G1H1R0A765	CERAMIC CAPACITOR	
			(FUSE)	
⚠	F301	ERBRD3R00X	FUSE	
⚠	F302	ERBRD2R50X	FUSE	
			(OTHERS)	
	P101	D4DAY220A022	THERMISTOR	
	X501	H0J103500038	CRYSTAL OSCILLATOR(*1)	

16.5.1.3. Operational & Hook Switch P.C.Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB2	PNWPBTGF380H	OPERATIONAL P.C.BOARD ASS'Y (RTL)	
	PCB3	PNWPCTGF380H	HOOK SWITCH P.C.BOARD ASS'Y (RTL)	
			(LEDS)	
	LED901	B3AAB0000347	LED	
	LED902	B3AAB0000347	LED	
	LED903	B3AAB0000347	LED	
	LED911	B3ABB0000331	LED	
	LED912	B3ABB0000331	LED	
			(IC FILTERS)	
	L901	J0JCC0000276	IC FILTER	
	L902	J0JCC0000276	IC FILTER	
			(SWITCH)	
	SW901	K0L1LB000021	SPECIAL SWITCH	
			(CAPACITORS)	
	C912	ECUE1H100DCQ	0.1	
			OTHERS	
	MIC	L0CBAY000123	BUILT IN-MICROPHONE	

16.5.1.4. LCD P.C.Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB4	PNWPDTF380H	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
	R13	ERJ6GEY0R00	0	S
			(CAPACITORS)	
	C1	F1H1E1050001	1	
	C5	F1H1E1050001	1	
	C10	F1H1E1050001	1	
			(CONNECTORS)	
	CN1	K1MY08BA0672	CONNECTOR	
	CN2	K1MY20BA0672	CONNECTOR	

16.5.1.5. LED Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
			(LEDS)	
	LED1	B3AFB0000370	LED	
	LED2	B3AFB0000370	LED	
			(RESISTORS)	
	R14	ERJ3GEYJ330	33	S
	R15	ERJ3GEYJ330	33	S

16.5.2. Handset

16.5.2.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	101	PNGP1360Z1	PANEL, LCD	PMMA-HB
	102	PNYE7744Z	TAPE, DOUBLE SIDED	
	103	PNKM1601Z3	CABINET BODY	ABS-HB
	104	L0AD01A00029	RECEIVER	
	105	PNYE1107Z	SPACER, CUSHION LCD	
	106	PNBC1492V1	BUTTON, NAVIGATOR KEY	ABS-HB
	107	PNJK1246X	KEYBOARD SWITCH	
	108	PNHR1757Z	GUIDE, SPEAKER	ABS-HB
	109	PQHG10729Z	RUBBER PARTS, RECEIVER	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	110	L0AA02A00120	SPEAKER	
	111	PNHS1502Z	SPACER, SPEAKER NET	
	112	PNKE1269Z1	COVER, EP CAP	
	113	PNJC1018Z	BATTERY TERMINAL	
	114	PNKF1271Z1	CABINET COVER	ABS-HB
	115	PNHS1691Z	SPACER, BATTERY	
	116	PNKK1076Z1	LID, BATTERY	ABS-HB
	117	PNHR1644Z	SPACER	PS-HB

16.5.2.2. Main P.C. Board Parts

Note:

- (*1) Reconfirm the model No. written on the handset's name plate when replacing PCB100. Because the model No. of the optional handset may differ from the included handset
- (*2) When replacing IC1, IC3 or X1, make an adjustment using PNZZTGF380AG. Refer to **Handset** (P.67) of Things to Do after Replacing IC or X'tal.
- (*3) When replacing the handset LCD, See **How to Replace the Handset LCD** (P.56)
- (*4) Backside of this IC has a ground plate, Refer to **How to Replace the Flat Package IC** (P.70)
- (*5) Supplied IC is Flat Package Type.

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB100	PNWPAFA30LAR	MAIN P.C.BOARD ASS'Y (RTL) (*1)	
			(ICs)	
	IC4	C0DBZYY00357	IC	
			(TRANSISTORS)	
	Q10	B1ADNB000003	TRANSISTOR(SI)	
	Q11	2SC6054JSL	TRANSISTOR(SI)	S
	Q12	B1ADCF000040	TRANSISTOR(SI)	S
	Q2	B1ADCF000040	TRANSISTOR(SI)	S
	Q3	B1ABGE000011	TRANSISTOR(SI)	S
	Q4	B1ADCF000040	TRANSISTOR(SI)	S
	Q6	DRC9113Z0L	TRANSISTOR(SI)	
	Q9	2SC6054JSL	TRANSISTOR(SI)	S
			(DIODES)	
	D13	B0BC4R3A0006	DIODE(SI)	S
	D14	B0BC4R3A0006	DIODE(SI)	S
			(LEDS)	
	LED1	B3AEB0000146	LED	
	LED2	B3AEB0000146	LED	
	LED3	B3AEB0000146	LED	
	LED4	B3AEB0000146	LED	
	LED5	B3AEB0000146	LED	
	LED6	B3AEB0000146	LED	
	LED20	B3AFB0000370	LED	
			(RESISTOR ARRAYS)	
	RA2	EXB28V391JX	RESISTOR ARRAY	
	RA3	D1H43912A014	RESISTOR ARRAY	
			(IC FILTER)	
	L1	J0JCC0000286	IC FILTER	
			(RESISTORS)	
	R2	ERJ2GEJ303	30k	S
	R3	D0GA152JA021	1.5k	S
	R4	ERJ2GEJ473	47k	S
	R6	ERJ2GEJ103	10k	S
	R7	D0GA104JA021	100k	S
	R8	ERJ8GEYJ4R3V	4.3	S
	R9	ERJ2GEJ303	30k	S
	R10	ERJ3GEYJ1R0	1	S
	R11	D0GA681JA021	680	S
	R12	ERJ2GEJ183	18k	S
	R13	ERJ2GEJ103	10k	S
	R20	ERJ2GEJ303	30k	S
	R45	D0GBR10JA113	0.1	
	R70	ERJ2GEJ470	47	S
			(CAPACITORS)	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C113	ECUE1H100DCQ	10p	
	C15	ECUE1H390JCQ	39p	
	C27	ECUE1H102KBQ	0.001	
	C5	ECUE1A104KBQ	0.1	
	C56	ECUE0J105KBQ	1	
	C57	ECUE0J105KBQ	1	
	C58	ECUE0J105KBQ	1	
	C6	ECUE1H680JCQ	68p	
	C70	ECUE1H680JCQ	68p	
	C71	ECUE1H680JCQ	68p	
	C79	ECUE1H101JCQ	100p	
	C82	ECUE1H102KBQ	0.001	
	C84	ECUE1H102KBQ	0.001	
	C86	ECUE1H101JCQ	100p	
	C90	ECUE1A104KBQ	0.1	
	C91	ECUV1C105KBV	1	
	C92	ECUE0J105KBQ	1	
			(OTHERS)	
	CN4	K2HD103D0001	JACK/SOCKET	S
△	F1	ERBRD2R50X	FUSE	
	MIC100	L0CBAY000053	BUILTIN-MICROPHONE	
	E101	L5DYBY00001	LIQUID CRYSTAL DISPLAY (*3)	S
	E102	PNHR1756Z	TRANSPARENT PLATE, LCD	PMMA-HB
	E103	PNHR1755Z	GUIDE, LCD	ABS-HB
	E104	PQH610729Z	RUBBER PARTS, RECEIVER	
	E105	PNVE1011Z	BATTERY TERMINAL	ABS-HB
	E106	PNJT1141Z	CHARGE TERMINAL (L)	
	E107	PNJT1140Z	CHARGE TERMINAL (R)	

16.5.2.3. BBIC P.C.Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
			(IC)	
	IC1	C2HBCY000162	IC(*2)(*4)(*5)	
	IC3	PNWITGFA30R	IC(EEPROM)(*2)	
			(COIL)	
	L801	G1C2N7Z00009	COIL	
			(RESISTOR ARRAYS)	
	RA1	EXB28V103	RESISTOR ARRAY	
	RA4	EXB24V272J	RESISTOR ARRAY	
	RA5	EXB28V332JX	RESISTOR ARRAY	
			(IC FILTER)	
	L3	J0JDC0000045	IC FILTER	
			(RESISTORS)	
	R21	ERJ2GEJ103	10k	S
	R22	D0GA332JA015	3.3k	S
	R23	ERJ2GEJ391	390	S
	R24	ERJ2GEJ100	10	
	R25	ERJ2GEJ222	2.2k	S
	R26	D0GA332JA015	3.3k	S
	R27	ERJ2GEJ222	2.2k	S
	R28	ERJ2GEJ222	2.2k	S
	R31	ERJ2RKF1003X	100k	S
	R32	D0GA104JA021	100k	S
	R33	ERJ2RKF1003X	100k	S
	R80	ERJ2GEJ100	10	S
			(CAPACITORS)	
	C11	F1L1A104A054	CERAMIC CAPACITOR	
	C12	ECJ1VB0G106M	10	S
	C13	F1L1A104A054	CERAMIC CAPACITOR	
	C14	ECUE1A333KBQ	0.033	
	C16	F1J0J2260002	22	
	C17	F1L1H100A180	CERAMIC CAPACITOR	
	C18	F1L1H100A180	CERAMIC CAPACITOR	
	C2	F1J0J2260002	22	
	C20	ECJ1VB0G106M	10	S
	C21	ECUE0J105KBQ	1	S
	C22	F1L1A104A054	CERAMIC CAPACITOR	
	C24	ECUE0J105KBQ	1	
	C25	ECUV1A225KBV	2.2	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C26	ECJ1VB06106M	10	S
	C29	ECUE0J105KBQ	1	
	C3	F1J0J2260002	22	
	C30	ECUE0J105KBQ	1	
	C31	ECJ1VB06106M	10	S
	C32	ECUE0J105KBQ	1	
	C33	F1L1A104A054	CERAMIC CAPACITOR	
	C34	ECUE1H390JCQ	39p	
	C36	F1L1A104A054	CERAMIC CAPACITOR	
	C37	ECJ1VB06106M	10	S
	C38	ECUE1H100DCQ	10p	
	C39	ECUE1H101JCQ	100p	
	C40	F1L1A104A054	CERAMIC CAPACITOR	
	C41	F1L1A104A054	CERAMIC CAPACITOR	
	C43	F1L1A104A054	CERAMIC CAPACITOR	
	C44	ECUE0J105KBQ	1	
	C45	F1L1A104A054	CERAMIC CAPACITOR	
	C51	ECJ1VB06106M	10	S
	C52	ECUE1H100DCQ	10p	
	C53	ECUE1H120JCQ	12p	
	C68	ECUE0J105KBQ	1	
	C69	F1L1A104A054	CERAMIC CAPACITOR	
	C80	ECUE1A333KBQ	0.033	
	C800	F1G1H1R5A765	1.5p	
	C802	F1G1H2R0A765	2p	
	C803	F1G1H1R6A765	1.6p	
	C806	F1G1H1R0A765	1p	
	C807	ECUE1H100DCQ	10p	
	C96	ECUE1H100DCQ	10p	
			(OTHERS)	
	X1	H0J138500003	CRYSTAL OSCILLATOR (*2)	S

16.5.3. Charger Unit

16.5.3.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	200	PNLC1040SB	CHARGER UNIT ASS'Y without 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	PNLV233AGAZ	AC ADAPTOR	

16.5.4. Accessories and Packing Materials

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
▲	A1	PNLV226AG0Z	AC ADAPTOR	
	A2	PQJA10075Z	CORD, TELEPHONE	
	A3	PQJA212V	CORD, HANDSET	
	A4	PNLXP1005Y	HANDSET	
	A5	PNKE1268Z1	HANGER, BELT CLIP	ABS-HB
	P1	PNPK3886014Z	GIFT BOX	
	P2	PNPD1917Z	CUSHION	

16.5.5. Screws

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	A	XTB26+86FJ	TAPPING SCREW	
	B	XTB2+86FJ	TAPPING SCREW	

16.5.6. Fixtures and Tools

Note:

(*1) See **Equipment Required** (P.57), and **The Setting Method of JIG** (P.57)

(*2) When replacing the Handset LCD, See **How to Replace the Handset LCD** (P.56)

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
		PQZZ1CD300E	JIG CABLE (*1)	
		PNZZTGF380AG	BATCH FILE CD-ROM (*1)	
		PQZZ430PIR	TIP OF SOLDERING IRON (*2)	
		PQZZ430PRB	RUBBER OF SOLDERING IRON (*2)	