ORDER NO. KM41108478CE

Service Manual

Telephone Equipment

Model No. KX-TG3821BXB
KX-TGA381BXB

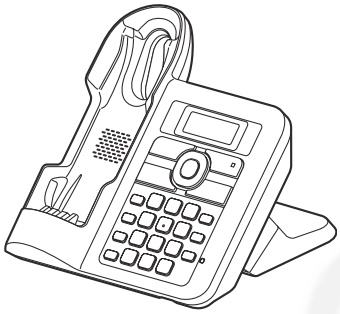
Caller ID Compatible

2.4 GHz Digital Cordless Answering System

B: Black Version

(for Asia, Middle Near East and Other areas)

KX-TGA381BXB
(Portable)



KX-TG3821BXB
(Base Unit)

Configuration for each model

Model No	Base Unit	Handset	Charger Unit
KX-TG3821	1 (TG3821)	1 (TGA381)	

Panasonic®

⚠ 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

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

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

Note:

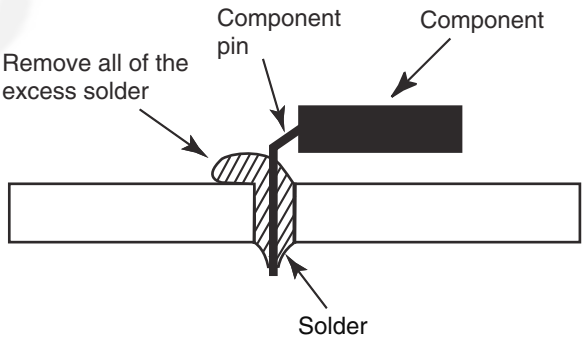
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

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).

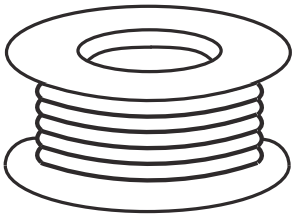
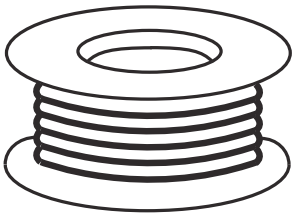
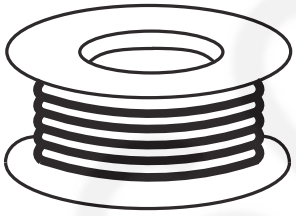


(Slice View)

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

	Base Unit	Handset
Power Supply	AC Adaptor (PNLV226BX0Z, 100-240 V AC, 50/60 Hz)	Rechargeable Ni-MH battery (2 x 1.2 V, 550 mAh)
Receiving/Transmitting Frequency	91 channels within 2.4 GHz - 2.48 GHz	91 channels within 2.4 GHz - 2.48 GHz
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 ± 41 Hz	10.368 MHz ± 41 Hz
Modulation Method	Frequency Modulation	Frequency Modulation
Spread spectrum Method	Frequency Hopping Spread spectrum	Frequency Hopping Spread spectrum
ID Code	19 bit	22 bit
Security Codes	——	1,000,000
Ringer Equivalence No. (REN)	0.1	——
Dialing Mode	——	Tone (DTMF)/Pulse
Redial	Up to 48 digits	Up to 24 digits
Speed Dialer	——	Up to 24 digits (Phonebook)
Power Consumption	Standby: Approx. 1.0 W, Maximum: Approx. 4.0 W	6 days at Standby, 10 hours at Talk
Operating Environment	0 °C - 40 °C, 20% - 80% relative air humidity (dry)	0 °C - 40 °C, 20% - 80% relative air humidity (dry)
Dimensions (H x W x D)	Approx. 134 mm x 159 mm x 180 mm	Approx. 173 mm x 48 mm x 32 mm
Mass (Weight)	Approx. 370 g	Approx. 140 g

Note:

- Design and specifications are subject to change without notice.

Note for Service:

- Optional headset: KX-TCA94EX, RP-TCA400, RP-TCA430

4 Technical Descriptions

4.1. FHSS Description

4.1.1. Frequency

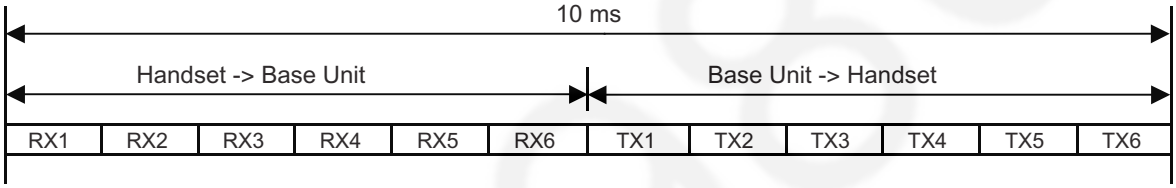
The frequency range of 2.4 GHz-2.48 GHz is used. Transmitting and receiving channel between base unit and handset is same frequency.

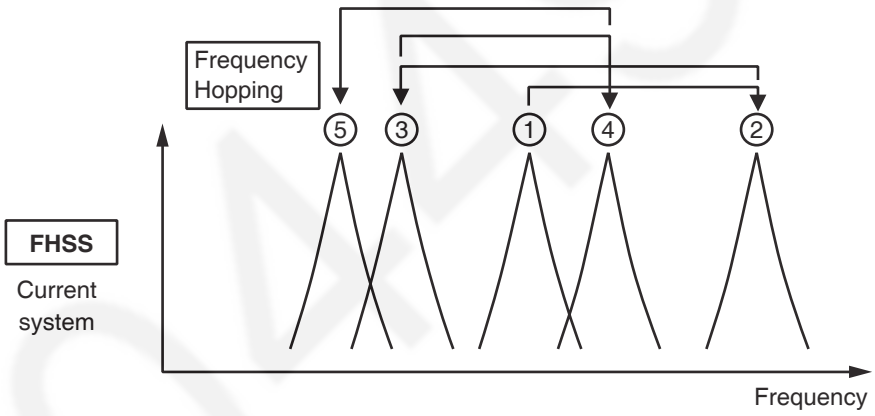
4.1.2. FHSS (Frequency Hopping Spread Spectrum)

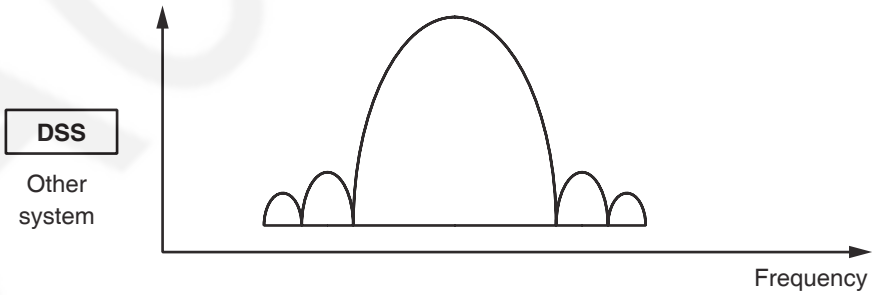
This telephone is using an IC chip which has similar specification to WDCT (World Digital Cordless Telephone) and is the telephone system that can use multiple portable unit simultaneously. The explanation of this system is mentioned below. This system uses a Time Division Multiple Access/Time Division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

transmitting and receiving frequencies of the base unit and handset are shared in the same frequency. The construction of RX/TX frequency data is shown below. It consists of 6 slots from the base unit to the handset, and 6 slots from the handset to the base unit, total 12 slots in 10 ms. By this slot system, simultaneous air link and communication between 6 handsets and the base unit can be realized. One communication between handset and the base unit is done by one slot from the base unit to handset, and another slot from handset to the base unit.

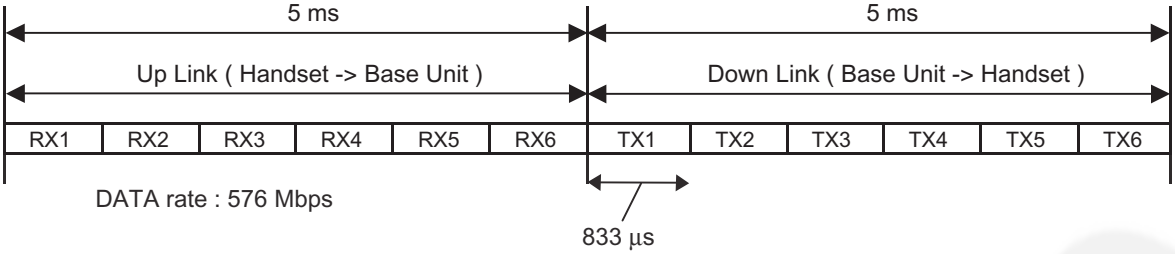
DSS makes spectrum spread by multiplying carrier signal by PN code. The purpose to make spectrum spread is to reduce power density per time and per band. On the other hand, **FHSS** makes spectrum spread by changing channel every 10 ms according to Hopping table. Also the purpose to make spectrum spread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







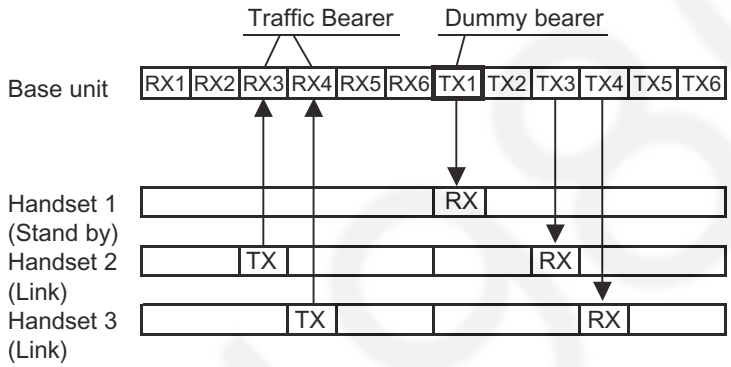
4.1.2.1. TDD Frame Format



4.1.2.2. 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 833 us, the 10 ms of voice data is transmitted.
Each slot makes every frame frequency hop. (100 hops/sec.)
Although each slot (UpLink3 and UpLink4) uses different frequency, UpLink3 and DownLink3 use the same frequency.

• **2 - Handsets Link**



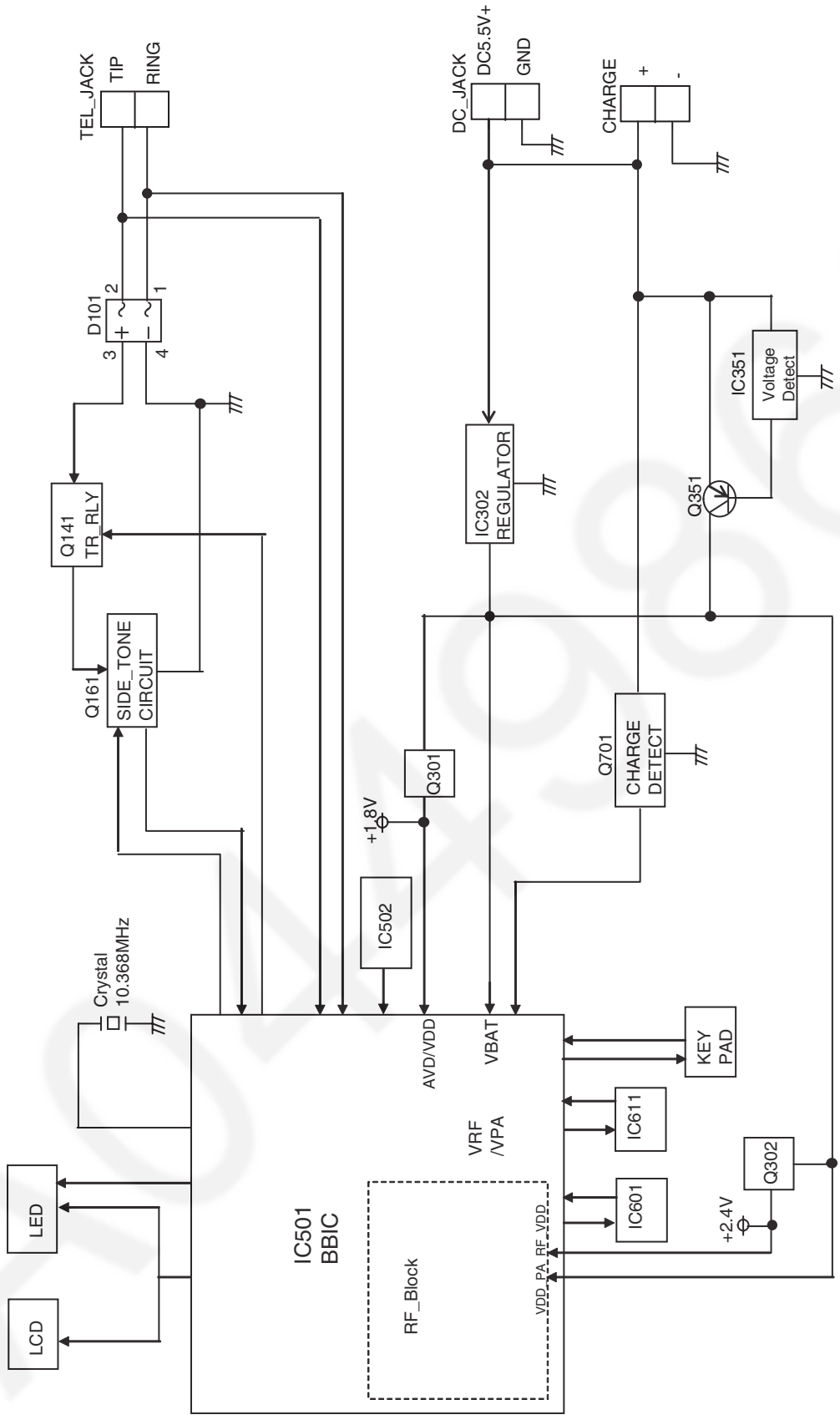
Traffic Bearer

A link is established between base unit and handset.
The state where duplex communication is performed.
The hopping pattern of a 75 hops (750 mseconds) cycle.

Dummy Bearer

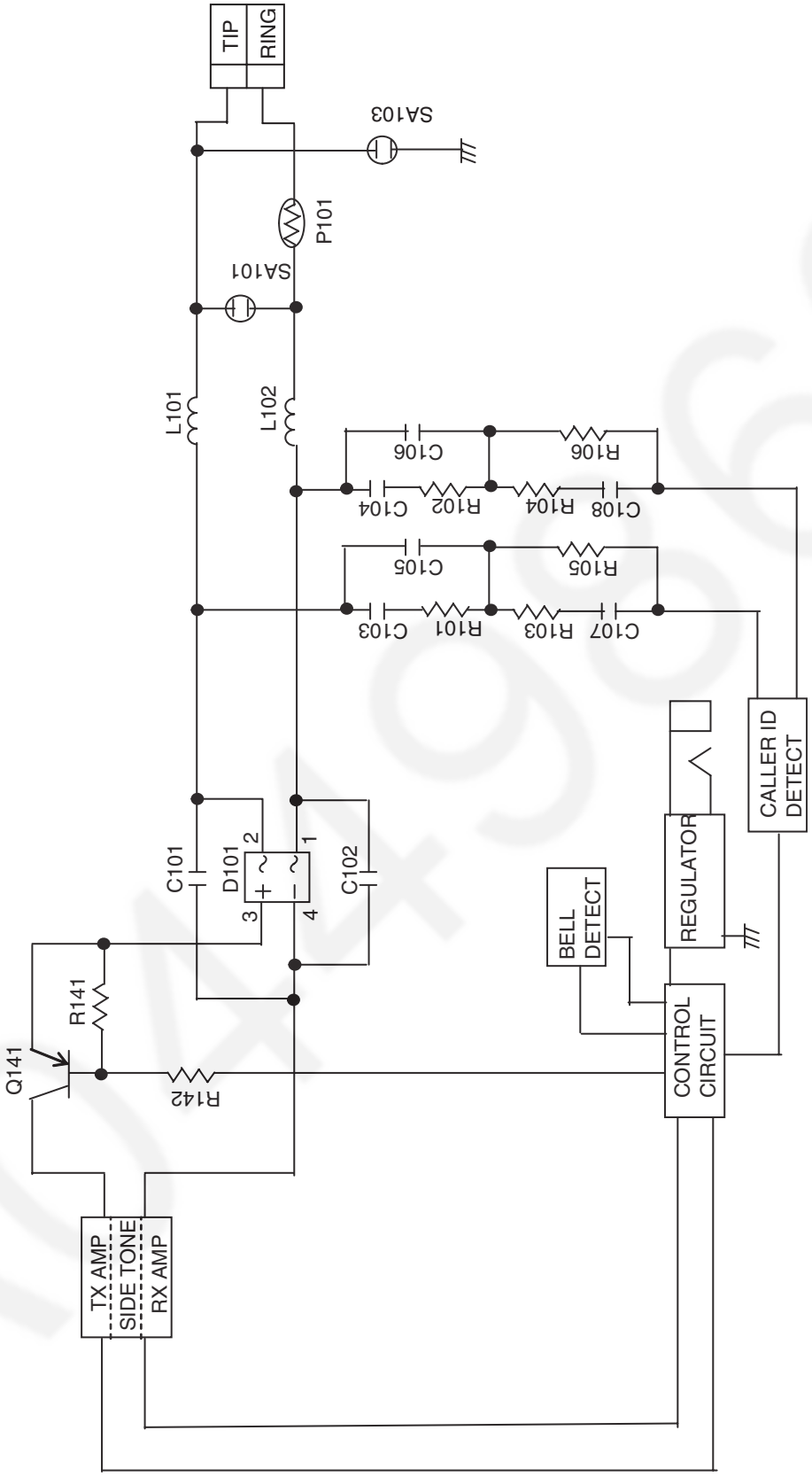
The base unit sends Dummy-data to the all stand-by state handsets.
The handsets receive that data for keeping synchronization and monitoring request from the base unit.
Dummy Bearer doesn't contain B-field (sound) data.

4.2. Block Diagram (Base Unit_Main)

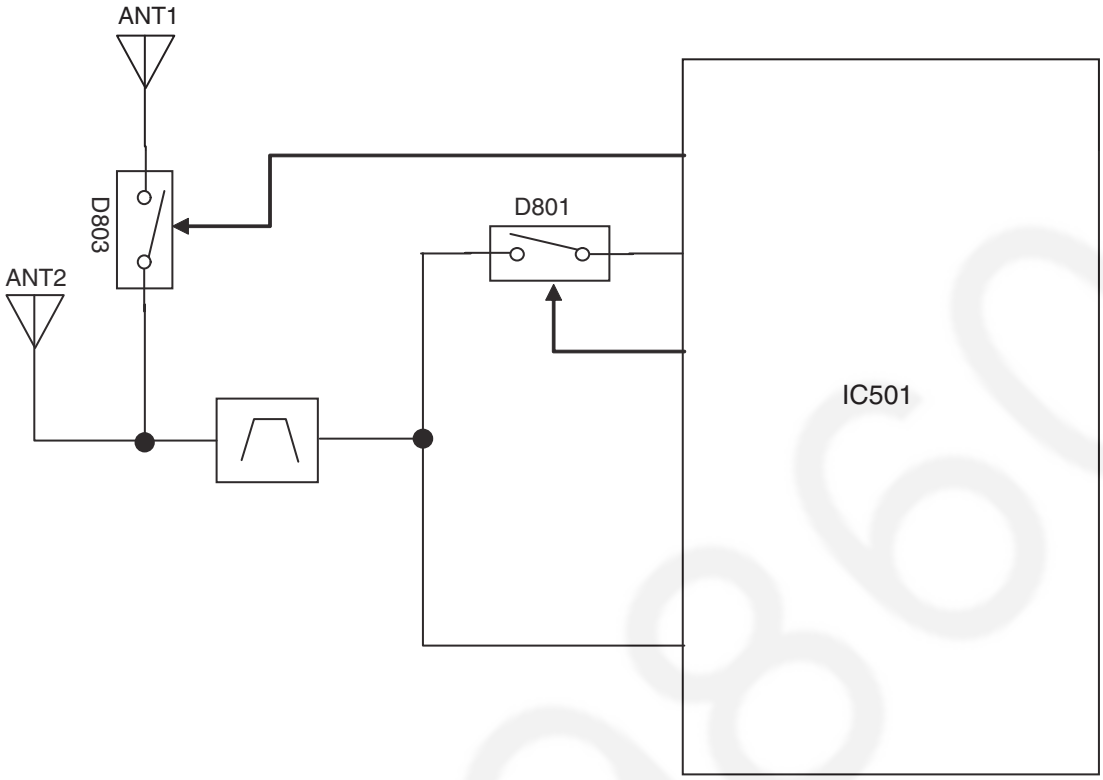


KX-TG3821 BLOCK DIAGRAM (Base Unit_Main)

4.3. Tel Interface Circuit



4.4. Block Diagram (Base Unit_RF Part)



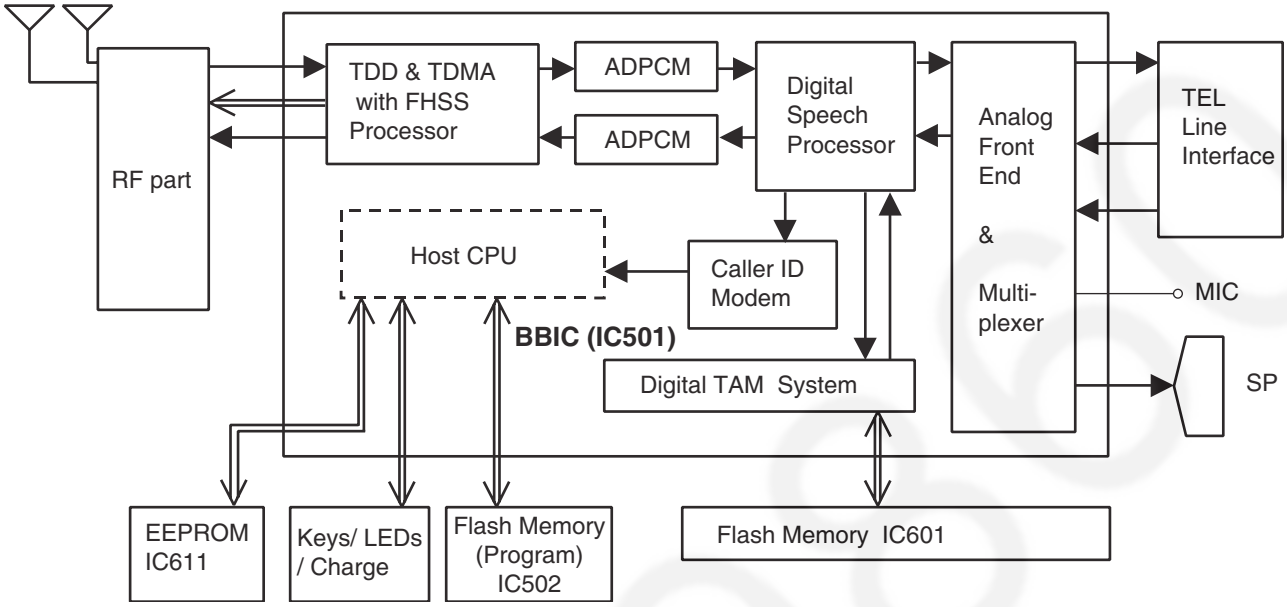
KX-TG3821 BLOCK DIAGRAM (Base Unit_RF Part)

4.5. Circuit Operation (Base Unit)

General Description:

(BBIC Flash Memory, EEPROM) 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.



4.5.1. 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.

4.5.2. Flash Memory (IC502)

Main program data is stored.

4.5.3. Flash Memory (IC601)

Following information data is stored.

- **Voice signal**
  ex: Pre-recorded Greeting message, Incoming message

4.5.4. EEPROM (IC611)

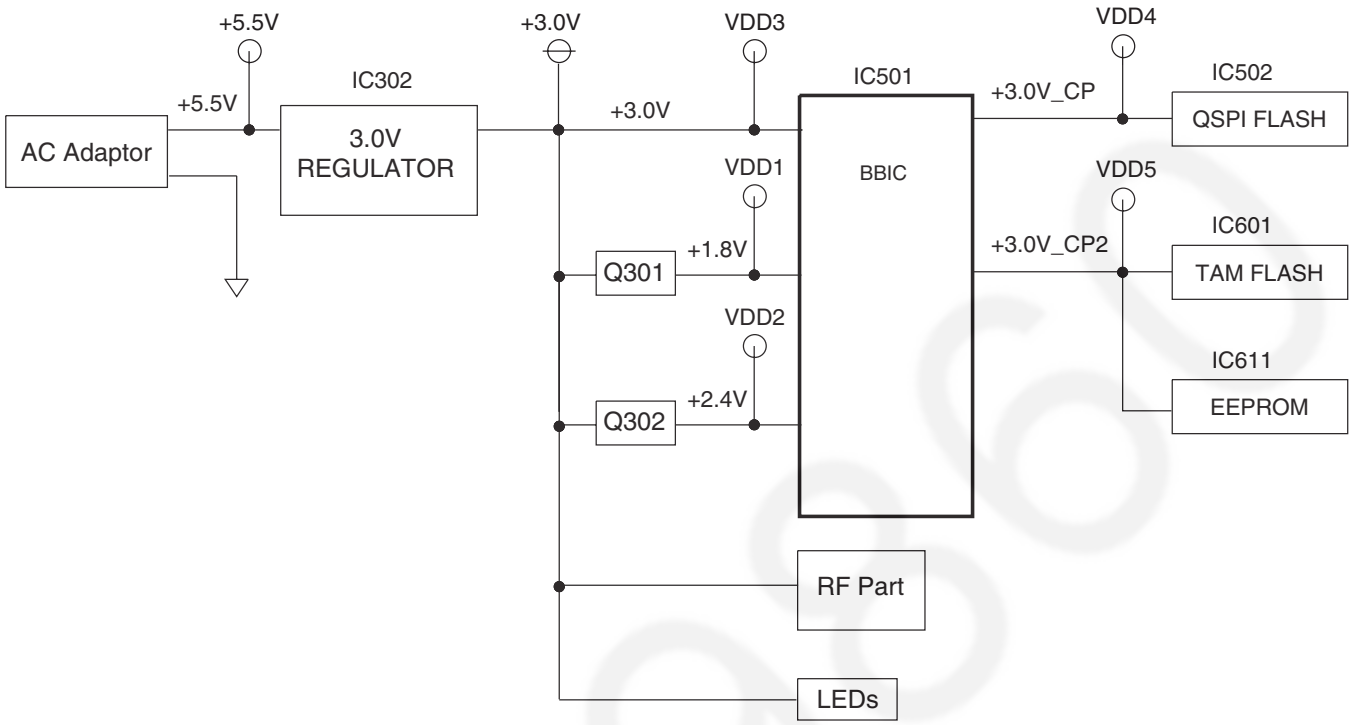
Following information data is stored.

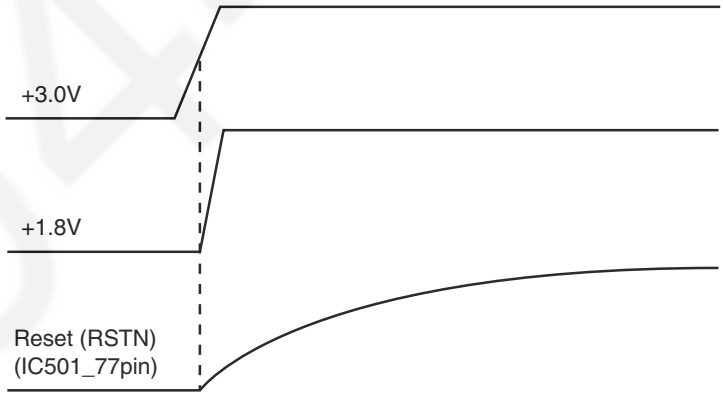
- **Settings**
  ex: message numbers, ID code, Flash Time, Tone/Pulse

4.5.5. Power Supply Circuit/Reset Circuit

The power supply voltage from AC adaptor is converted to VBAT (3.0V) in IC302. And +3.0V for peripherals and analog part is insulated from VBAT by Doubler of BBIC.

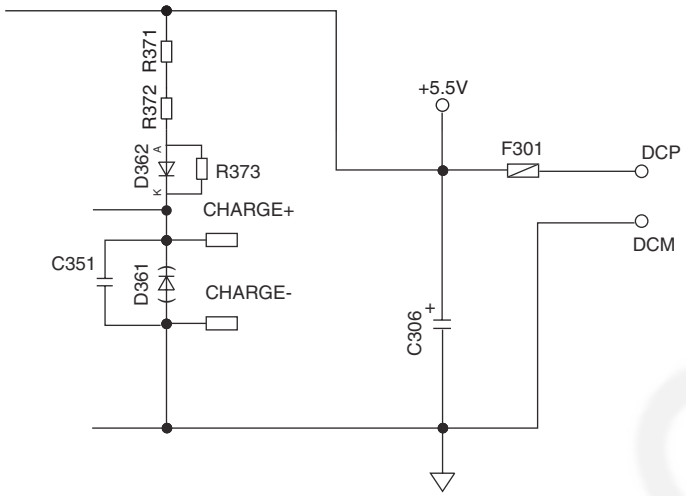
Circuit Operation:





4.5.5.1. Charge Circuit

The voltage from the AC adaptor is supplied to the charge circuits.



4.5.6. 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→L101→C105→R105→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 → L101 → D101 → Q141 → Q161 → R163 → R167 → D101 → L102 → P101 → R

ON HOOK Circuit:

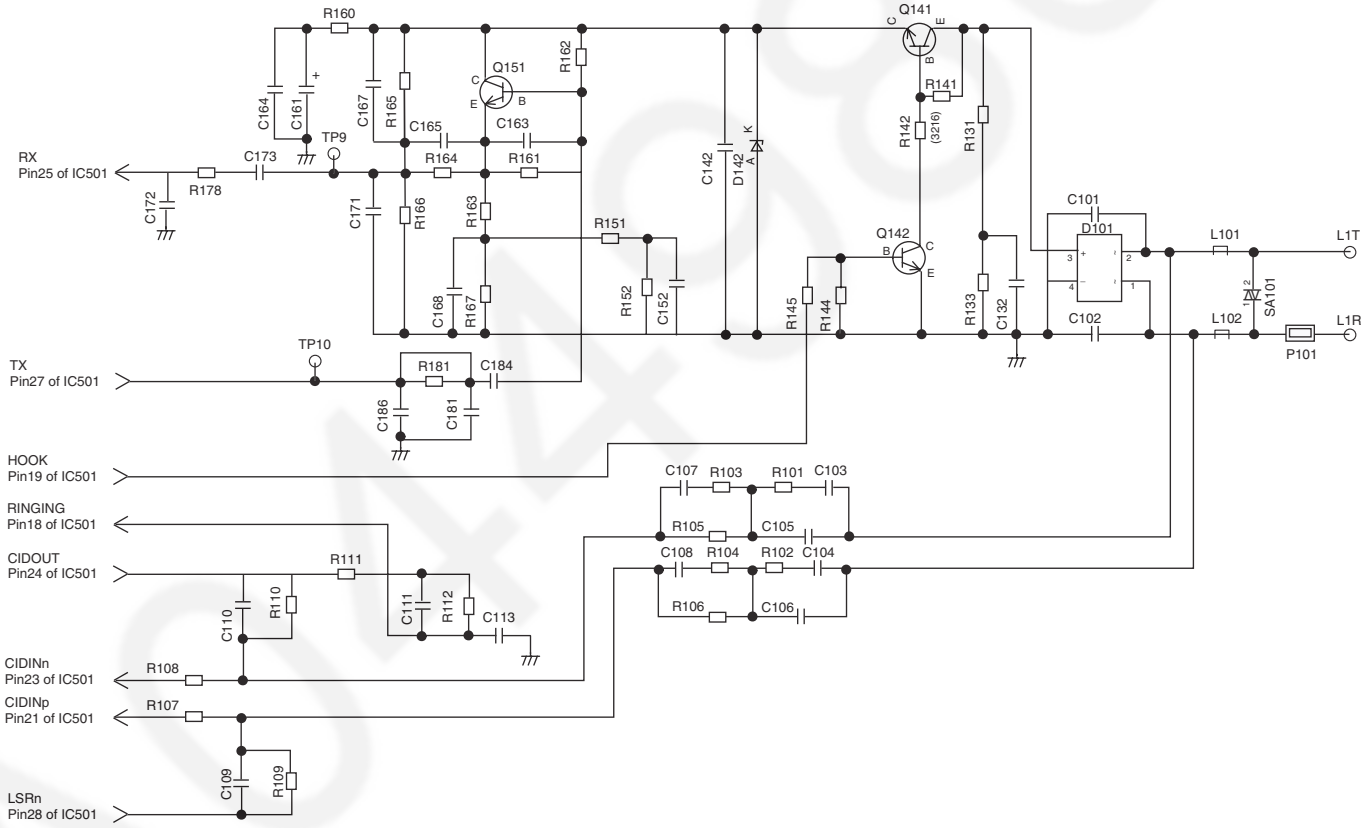
Q141 is open, Q141 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

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.



4.5.7. 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:

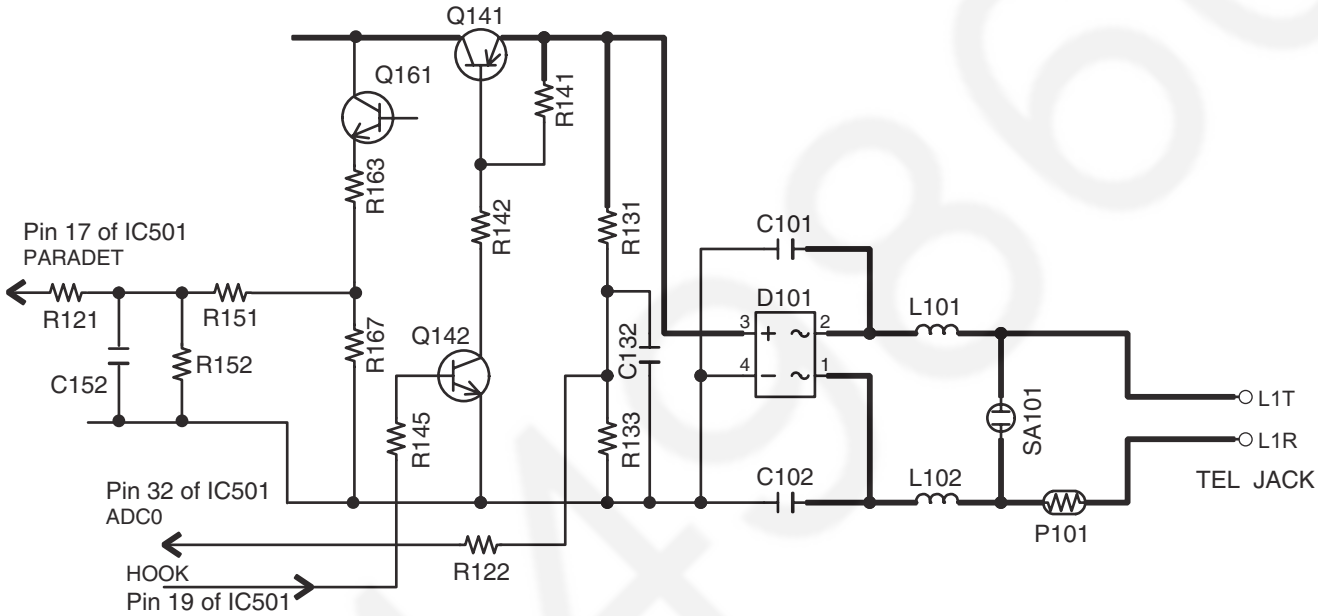
Parallel connection detection when on hook:

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.



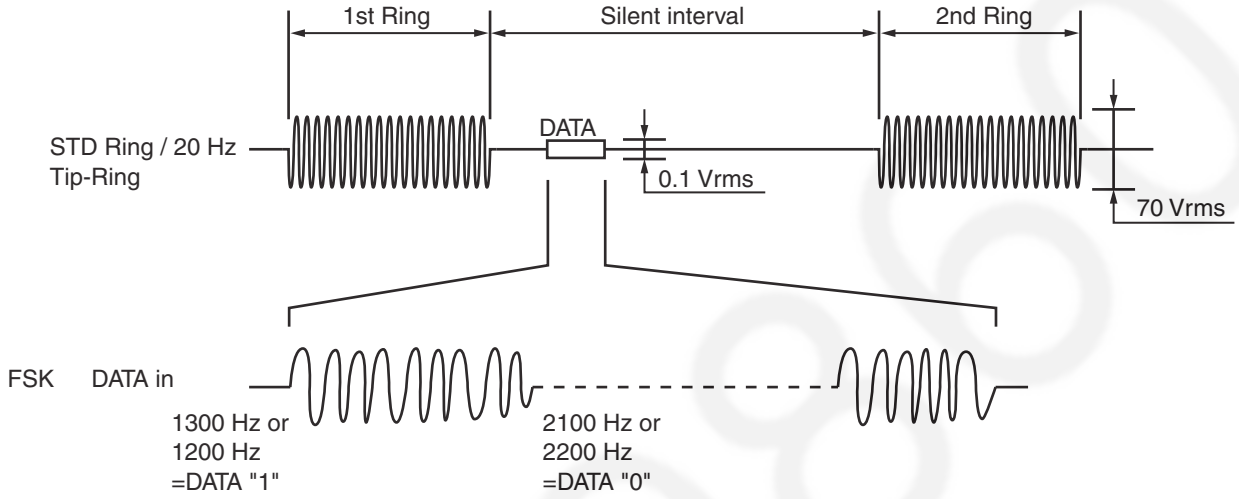
4.5.8. Calling Line Identification (Caller ID)/Call Waiting Caller ID

Function:

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

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

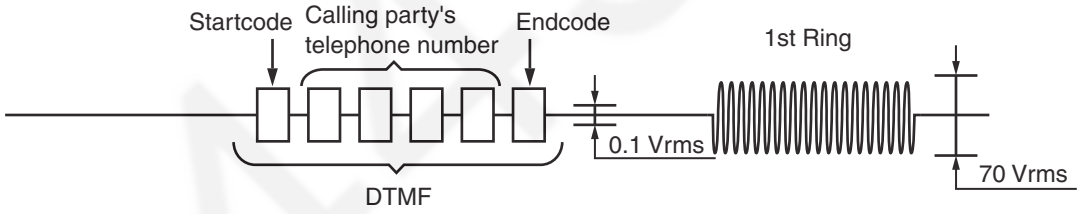
• **FSK (Frequency Shift Keying) format**



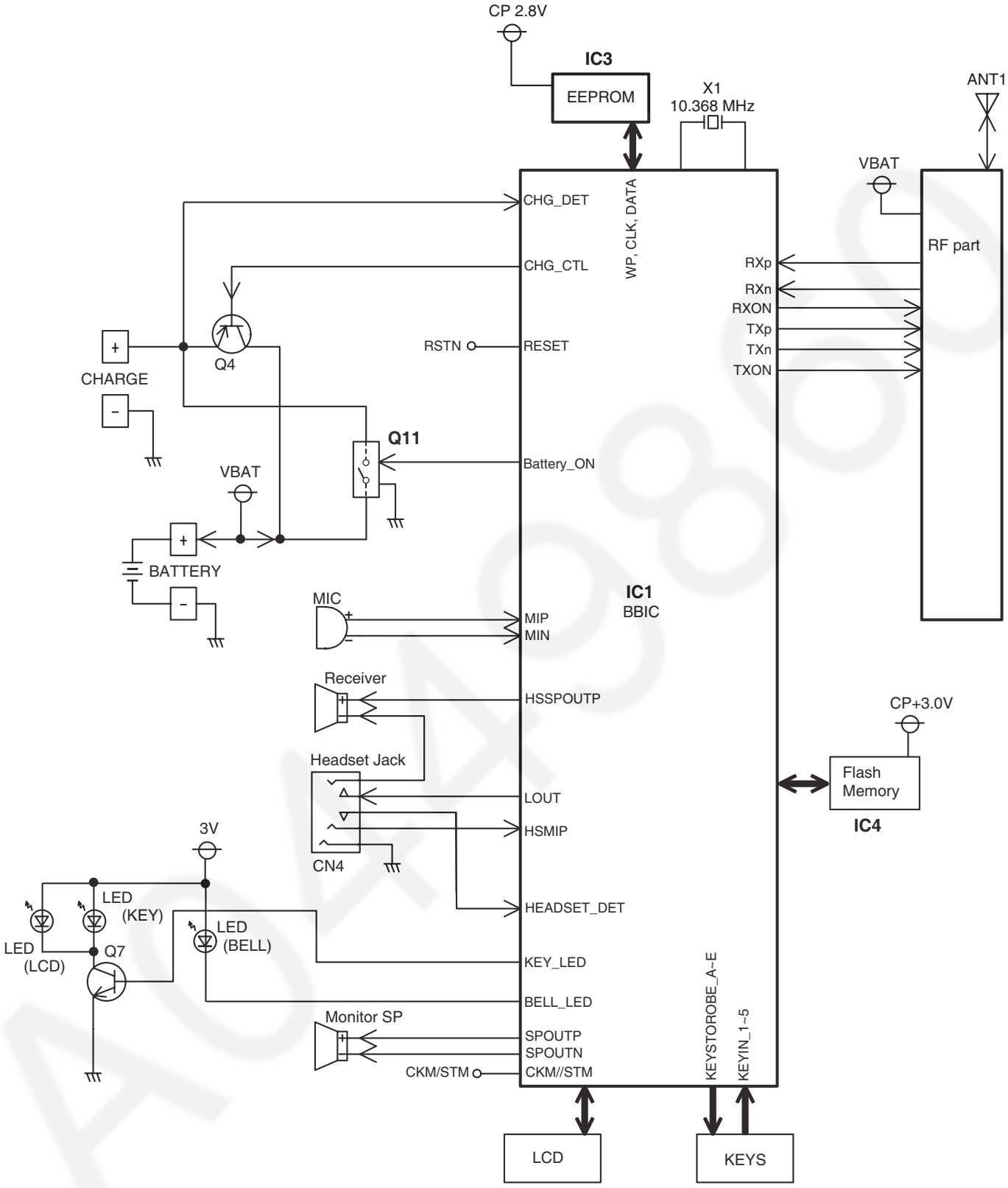
• **DTMF format**

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

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

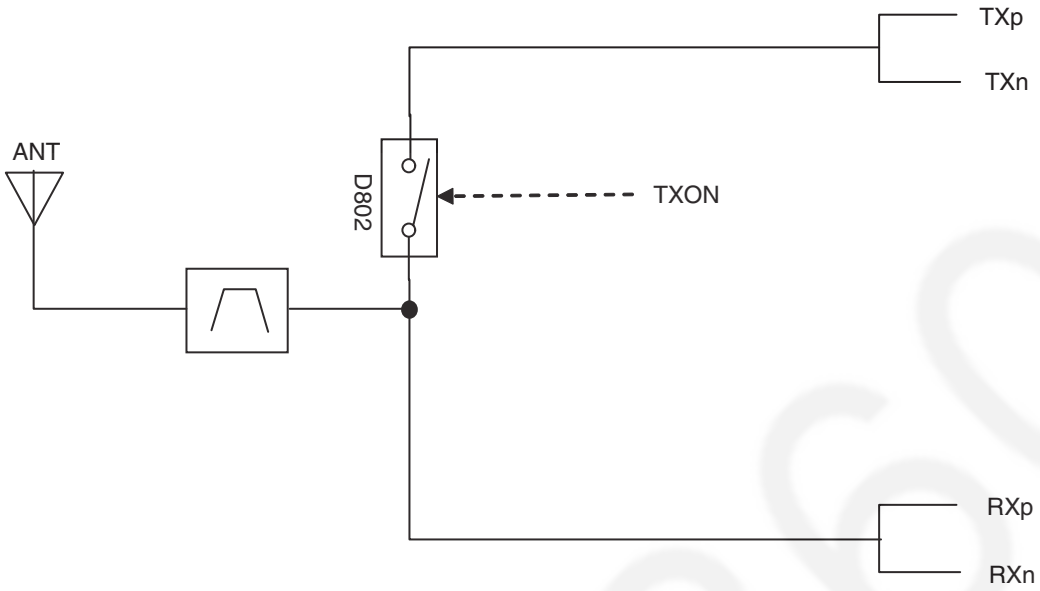


4.6. Block Diagram (Handset)



KX-TGA381 BLOCK DIAGRAM (Handset)

4.7. Block Diagram (Handset_RF Part)



KX-TGA381 BLOCK DIAGRAM (Handset_RF Part)

4.8. Circuit Operation (Handset)

4.8.1. Outline

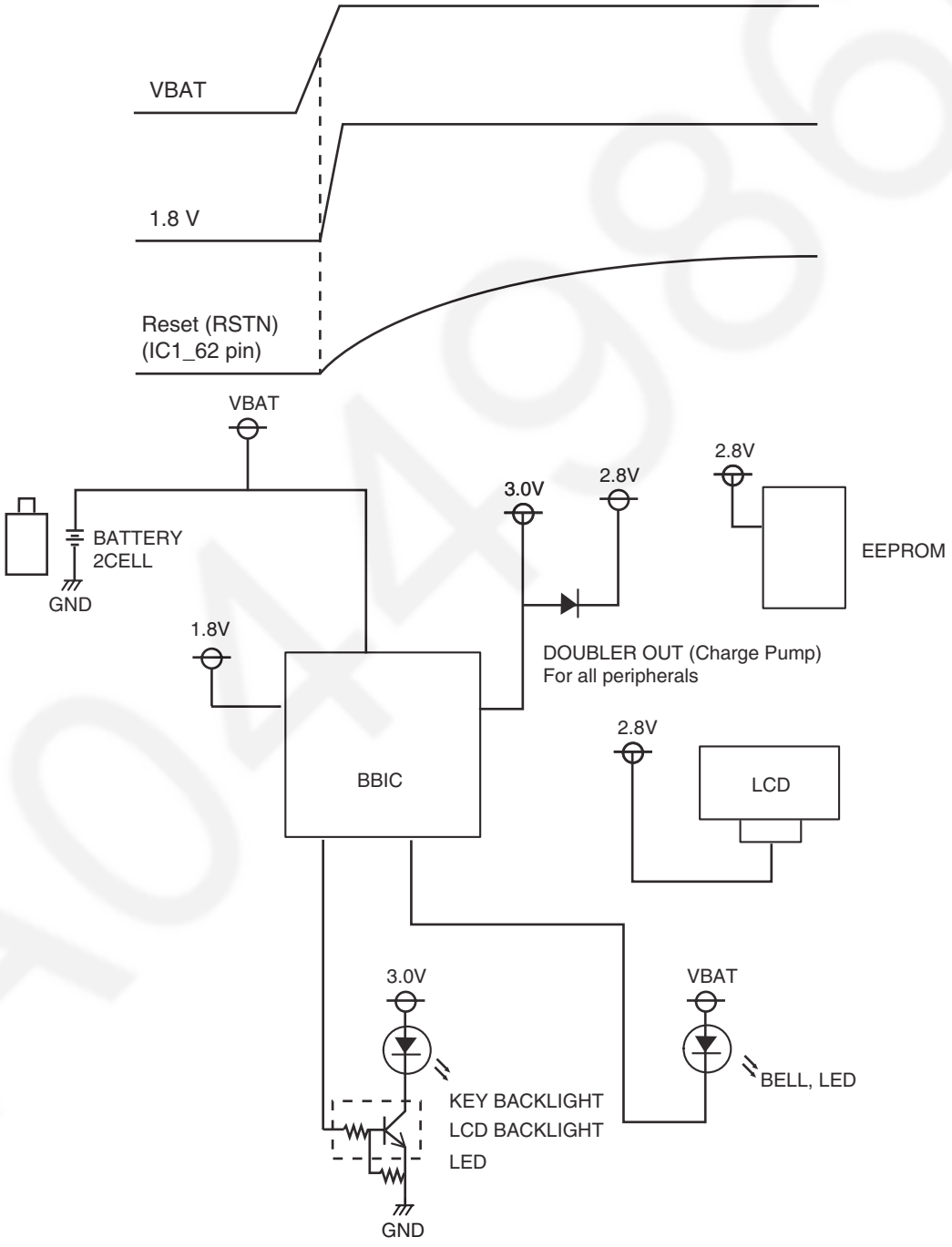
Handset consists of the following ICs as shown in **Block Diagram (Handset)** (P.18).

- 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)

4.8.2. 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 → BBIC (IC1) 41 pin
The Reset signal generates IC1 (62 pin) and 1.8 V.



4.8.3. Charge Circuit

Circuit Operation:

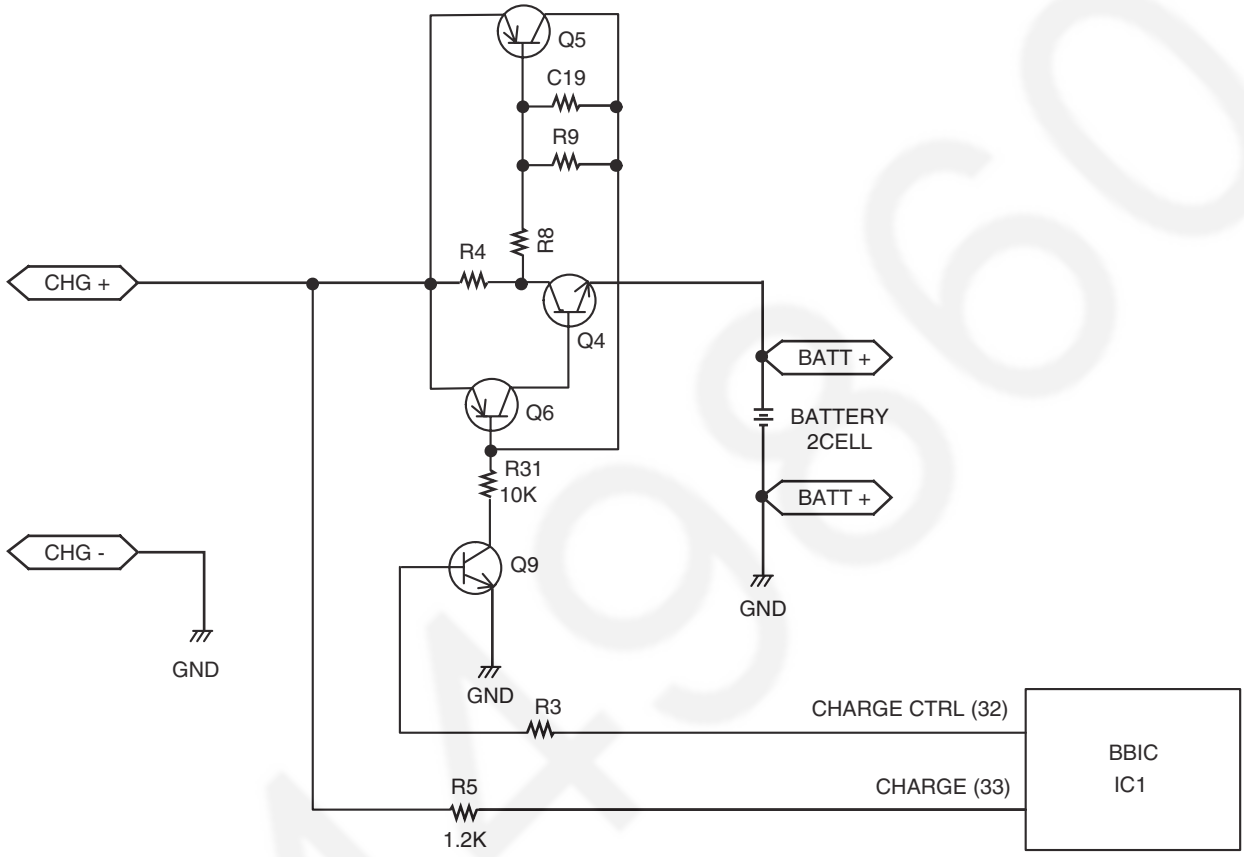
When charging the handset on the Base Unit, the charge current is as follows;

DCP+(5.5 V) → F301 → R371 → R372 → D362 → CHARGE+(Base) → CHARGE+(Handset) → {Q5 / R4} → Q4 → F1 → BATTERY+... Battery...

BATTERY- → R45 → GND → CHARGE-(Handset)→ CHARGE-(Base) → GND → DCM

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.



4.8.4. 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(Batt) ≦ 2.25 V ± 50 mV

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

- Power Down

  Battery voltage: V(Batt) ≦ 2.0 V ± 50 mV

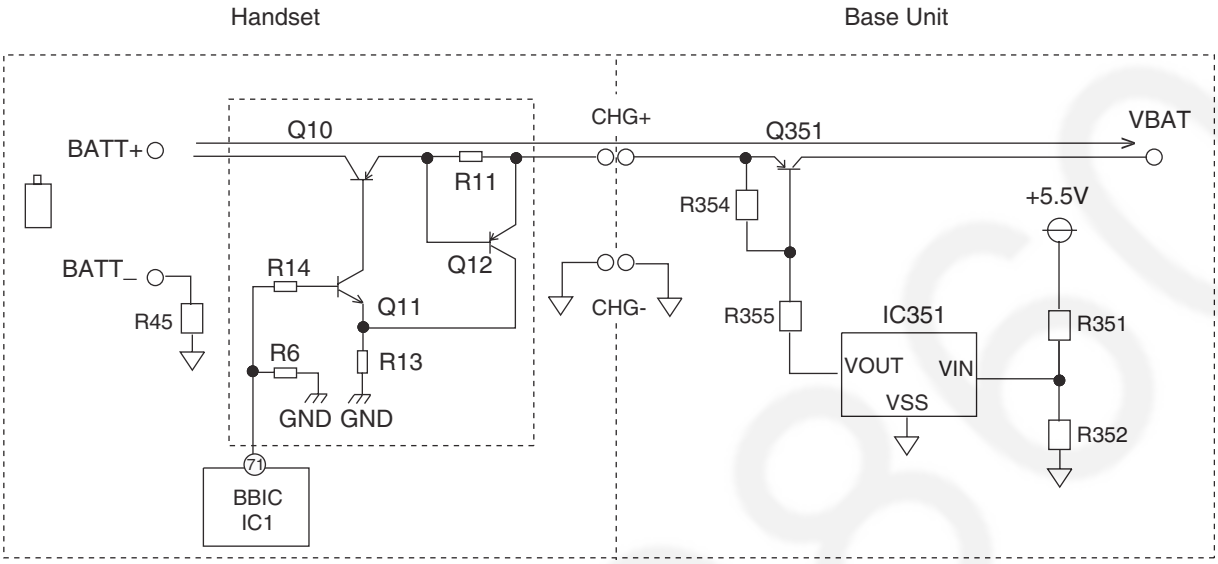
  The BBIC detects this level and power down.

4.9. Behavior of Electric Power Failure

In case that the power from AC adaptor is lost and lose radio waves, BBIC (IC1) turns Q11 and Q10 ON since handset presumes that base unit's power is failed.

Base unit detects that power voltage of AC adaptor +5.5V is OFF at IC351, then turns Q351 ON.

It's possible to use the units during the power failure, supplying power to VBAT of base unit from battery of handset through IC6, CHG terminal and Q351.



4.10. Signal Route

SIGNAL ROUTE	IN → ROUTE → OUT
HANDSET TX	HANDSET MIC - C11/13 - RA4 - IC1(19/20) - **<HANDSET_RF_TX_ROUTE>** - ANT. --- ANT. - **<BASE_UNIT_RF_RX_ROUTE>** - IC501(2/3 - 27) - C184 - Q161 -Q141 - D101 - L101/[L102-P101] - T/R (TEL LINE)
HANDSET RX	T/R (TEL LINE) - L101/[P101-L102] - D101 - Q141 - R165 - C173 - R178 - IC501(25 - 94/95) - **<BASE_UNIT_RF_TX_ROUTE>** - ANT --- ANT. - **<HANDSET_RF_RX_ROUTE>** - IC1(23/24) - C86 - L74 - HEADSET_JACK(5 - 4) - HANDSET SPEAKER
HEADSET TX	HEADSET_JACK(2) - R306 - C14 - R22 - IC1(21) - **<HANDSET_RF_TX_ROUTE>** - ANT. --- ANT. - **<BASE_UNIT_RF_RX_ROUTE>** - IC501(2/3 - 27) - C184 - Q161 -Q141 - D101 - L101/[L102-P101] - T/R (TEL LINE)
HEADSET RX	T/R (TEL LINE) - L101/[P101-L102] - D101 - Q141 - R165 - C173 - R178 - IC501(25 - 94/95) - **<BASE_UNIT_RF_TX_ROUTE>** - ANT --- ANT. - **<HANDSET_RF_RX_ROUTE>** - IC1(23) - C86 - L74 - HEADSET_JACK(5)
HANDSET SP-Phone TX	HANDSET MIC - C11/13 - RA4 - IC1(19/20) - **<HANDSET_RF_TX_ROUTE>** - ANT. --- ANT. - **<BASE_UNIT_RF_RX_ROUTE>** - IC501(2/3 - 27) - C184 - Q161 -Q141 - D101 - L101/[L102-P101] - T/R (TEL LINE)
HANDSET SP-Phone RX	T/R (TEL LINE) - L101/[P101-L102] - D101 - Q141 - R165 - C173 - R178 - IC501(25 - 94/95) - **<BASE_UNIT_RF_TX_ROUTE>** - ANT --- ANT. **-<HANDSET_RF_RX_ROUTE>** - IC1(34/36) - Backside SP
BASE SP-Phone TX	MIC - C457/C458 - RA452 - IC501(37/38 - 27) - C184 - Q161 -Q141 - D101 - L101/[L102-P101] - T/R (TEL LINE)
BASE SP-Phone RX	T/R (TEL LINE) - L101/[P101-L102] - D101 - Q141 - R165 - C173 - R178 - IC501(25 - 41/43) - SPEAKER

Note:

[ ]: inside of Handset

SIGNAL ROUTE	IN → ROUTE → OUT
INTERCOM HANDSET TO BASE UNIT	HANDSET MIC - C11/13 - RA4 - IC1(19/20) - **<HANDSET_RF_TX_ROUTE>** - ANT. --- ANT - **<BASE_UNIT_RF_RX_ROUTE>** - IC501(2/3 - 41/43) - SPEAKER
INTERCOM BASE UNIT TO HANDSET	MIC - C457/C458 - RA452 - IC501(37/38 - 94/95) - **<BASE_UNIT_RF_TX_ROUTE>** - ANT --- ANT. - **<HANDSET_RF_RX_ROUTE>** - IC1(23/24) - C86 - L74 - HEADSET_JACK(5 - 4) - HANDSET SPEAKER
GREETING RECORDING	HANDSET MIC - C11/13 - RA4 - IC1(19/20) - **<HANDSET_RF_TX_ROUTE>** - ANT. --- ANT - **<BASE_UNIT_RF_RX_ROUTE>** - IC501(2/3 - 69/70) - IC601
GREETING PLAY TO TEL LINE	IC601 - IC501(69/70 - 27) - C184 - Q161 -Q141- D101 - L101/[L102-P101] - T/R (TEL LINE)
ICM RECORDING	T/R (TEL LINE) - L101/[P101-L102] - D101 - Q141 - R165 - C173 - R178 - IC501(25 - 69/70) - IC601
ICM PLAY TO SPEAKER	IC601 - IC501(69/70 - 41/43) - SPEAKER
DTMF SIGNAL TO TEL LINE	IC501(27) - C184 - Q161 -Q141- D101 - L101/[L102-P101] - T/R (TEL LINE)
CALLER ID	T/R(TEL LINE) - L101/[P101 - L102] - C105/C106 - R105/R106 - R108/R107 -IC501(23/21)
BELL DETECTION	T/R(TEL LINE) - L101 - C105 - R105 - R110 - R111 - R112 - IC501(18)
HANDSET RF [TX_ROUTE]	IC1(78/79) - L802 - C812 - D802 - ANT
HANDSET RF [RX_ROUTE]	ANT - C838 - C826 - IC1(2/3)
BASE UNIT RF [TX_ROUTE]	IC501(95/94) - L802/C813 - C812 - D801 - C852/C853 - ANT1/ANT2
BASE UNIT RF [RX_ROUTE]	ANT1/ANT2 - C852/C853 - C828 - L805/L806 - IC501(3/2)

Note:

[ ]: inside of Handset

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.

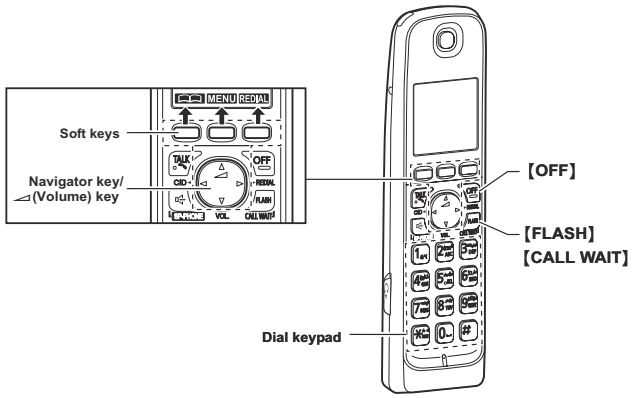
Items	Contents
Battery	You could use other rechargeable batteries sold in a market, but the unit is not guaranteed to work properly.
	The battery strength may not be indicated correctly if the battery is disconnected and connected again, even after it is fully charged. In that case, by recharging the battery as mentioned in the Operating Instructions, you will get a correct indication of the battery strength.

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 "Initial Setup" using 【▲】or【▼】
then press OK or 【►】.

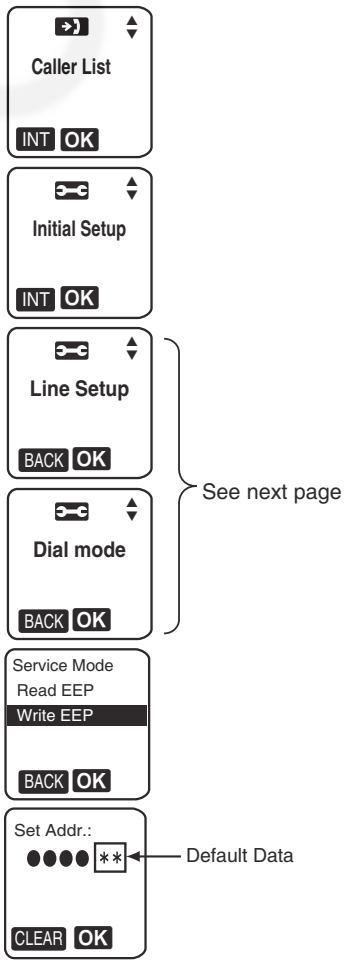
Select "Line Setup" using 【▲】or【▼】
then press OK or 【►】.

3). Enter "7", "2", "6", "2", "7", "6", "6", "4".
Note: 7262 7664 = PANA SONI
(see letters printed on dial keys)

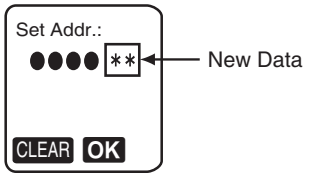
4). Select "Write EEP" using 【▲】or【▼】
then press OK or 【►】.

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, turn the base unit power off and then power on.

Note: * To enter "Dial mode", press **OK** or **【►】** at " Line Setup".
It is necessary to turn on the power of base unit.

Frequently Used Items (Base Unit)
ex.)

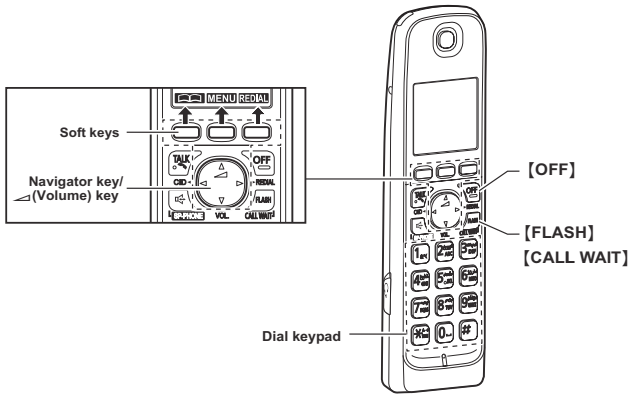
Items	Address	Default Data	New Data		Remarks
Frequency	00 07/00 08	70/02	-	-	Use these items in a **READ-ONLY** mode to confirm the contents. Careless rewriting may cause serious damage to the computer system.
ID	00 02~00 06	Given value	-	-	
C-ID (FSK) sensitivity	075B	00	01 (6dB up)	02 (12 dB up)	When hex changes from “00” to “01” or “02”, gain increases by 6 dB or 12 dB.
C-ID (DTMF) sensitivity	0790	50	60 (6dB up)	70 (12 dB up)	When hex changes from “50” to “60” or “70” gain increases by 6 dB or 12 dB.

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

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 Setup" using【▲】or【▼】
then press OK 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 OK or【►】.

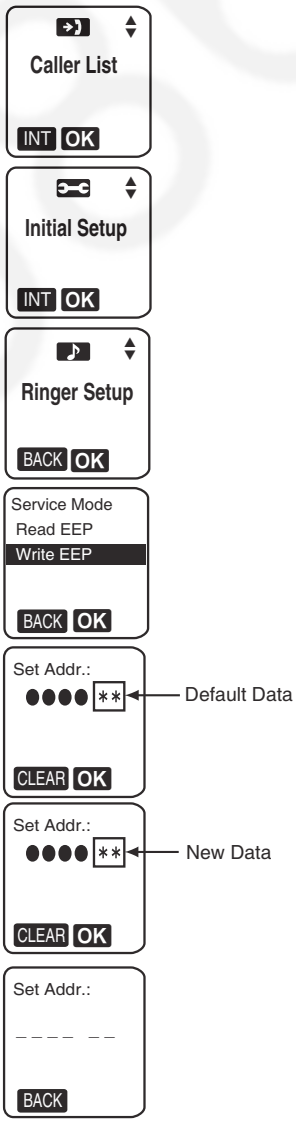
5). Enter "●", "●", "●", "●" (Address). (*1)

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.

H/S LCD



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	70	-	-	-	(*2)
Frequency	00 07/00 08	70/02	-	-	-	
ID	00 02~00 06	Given value	-	-	-	

Note:

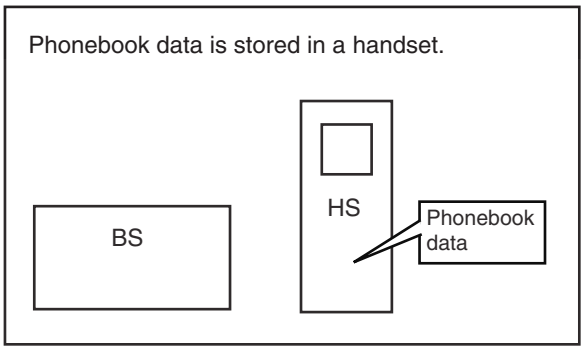
(*1) When you enter the address or New Data, please refer to the table below.

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

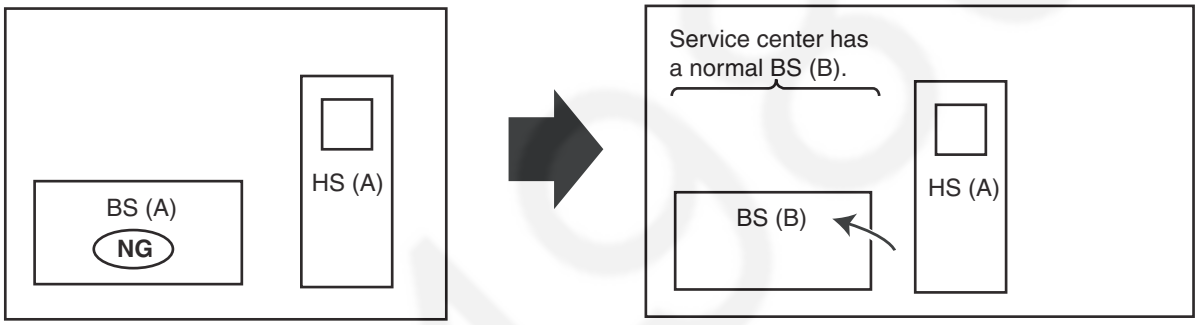
(*2) Use these items in a READ-ONLY mode to confirm the contents. Careless rewriting may cause serious damage to the handset.

8.2. Copying Phonebook Items when Repairing

You can copy the handset phonebook to another (compatible Panasonic) handset. This will help to save the original phonebook data which the customer has registered.
Refer to the following procedures.

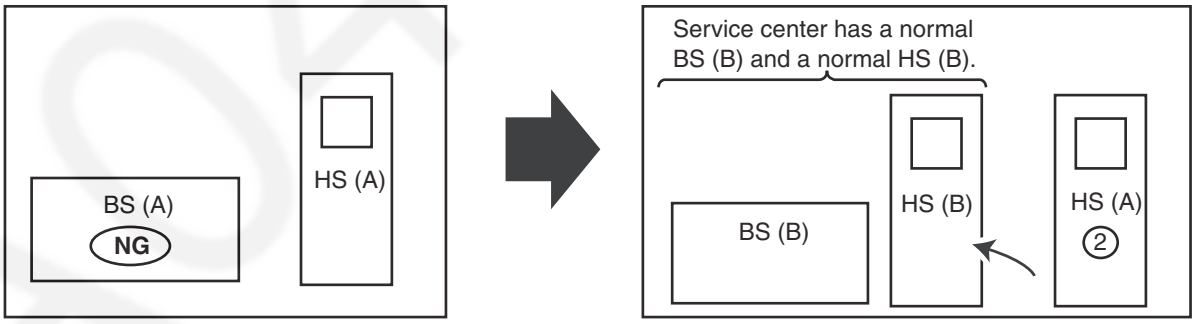


Case 1: A base unit has a defect.
(Replacing a base unit PCB etc...)



1. Register HS (A) to BS (B).
   HS (A) is normal, therefore no need to copy the phonebook data.

Case 2: A base unit has a defect.
(Replacing both a base unit and a handset)

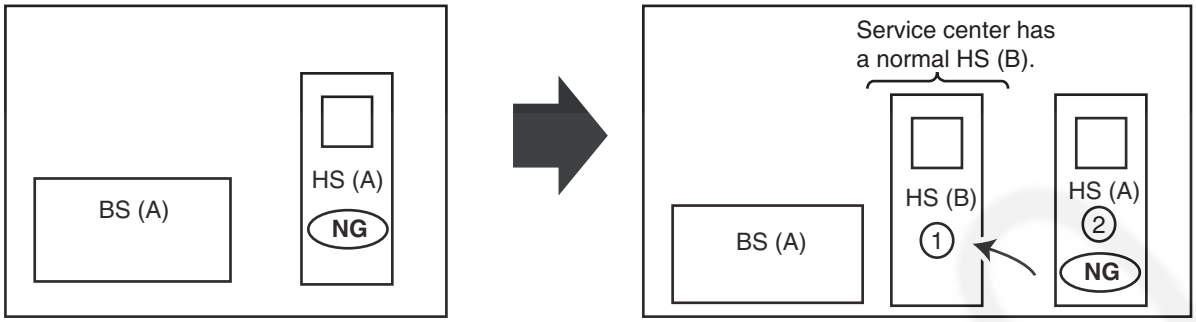


1. Register HS (A) to BS (B) as a handset no. 2.
2. Copy the phonebook data from HS (A) to HS (B).
3. Cancel the HS 2 (HS (A)).

Note:

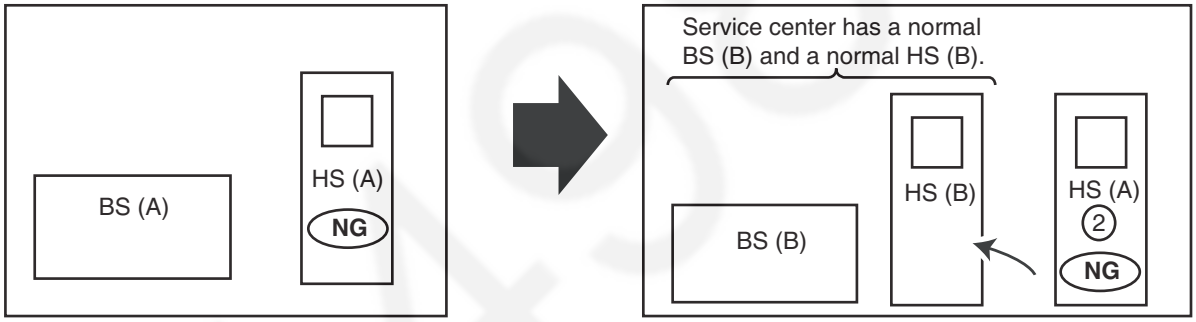
- BS=Base Unit, HS=Handset
- If the max number of handsets are already registered to the base unit, a new handset cannot be registered.
- To register the handset, refer to **Registering a Handset to the Base Unit** (P.41).
- To cancel the handset, refer to **Deregistering All Handsets by the Base Unit** (P.41).
- To copy the handset phonebook, refer to **Copying All Entries** (P.41).

Case 3: A handset has a defect.
(Radio transmission is functioning.)



1. Cancel HS (A).
2. Register HS (B) as a handset no. 1.
3. Register HS (A) as a handset no. 2.
4. Copy the phonebook data from HS (A) to HS (B).
5. Cancel HS 2 (HS (A)).

Case 4: A handset has a defect.
(Radio transmission is functioning.)



1. Register HS (A) as a handset no. 2.
2. Copy the phonebook data from HS (A) to HS (B).
3. Cancel HS 2 (HS (A)).

Note:

- BS=Base Unit, HS=Handset
- If the max number of handsets are already registered to the base unit, a new handset cannot be registered.
- To register the handset, refer to **Registering a Handset to the Base Unit** (P.41).
- To cancel the handset, refer to **Deregistering All Handsets by the Base Unit** (P.41).
- To copy the handset phonebook, refer to **Copying All Entries** (P.41).

9 Service Mode

9.1. How to Clear User Setting

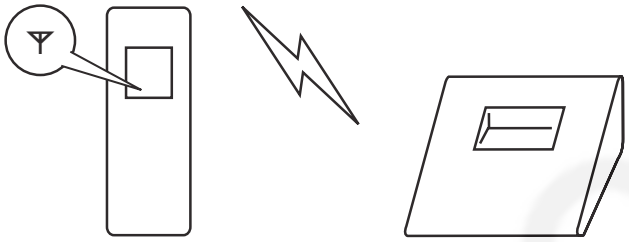
Units are reset to the Factory settings by this operation (Erase recorded Voice messages, stored Phone numbers, Caller list and etc.)

Note:

- Some menus are not reset. Refer to **Operating Instructions** (P.25).
- The reset menus differ depending on the following operations.
- **This operation should not be performed for a usual repair.**

9.1.1. 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.



Handset **Base unit**

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 (lights).
If the handset is not registered to the base unit (flashes), register it. (*1)

③ Lift the handset and press【OFF】to put the handset in standby mode.

④ Press 1, 5, 9 and * key of the handset simultaneously until a confirmation tone is heard.

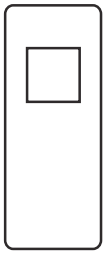
⑤ Disconnect the AC adaptor, then remove the battery.

Note:

(*1) Refer to **Registering a Handset to the Base Unit** (P.41).

9.1.2. Resetting only handset

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



Handset

① Install the charged batteries into the handset.

② Lift the handset and press【OFF】to put the handset in standby mode.

③ Press 1, 5, 8 and # key of the handset simultaneously until a confirmation tone is heard. (*2)

④ Remove the battery.

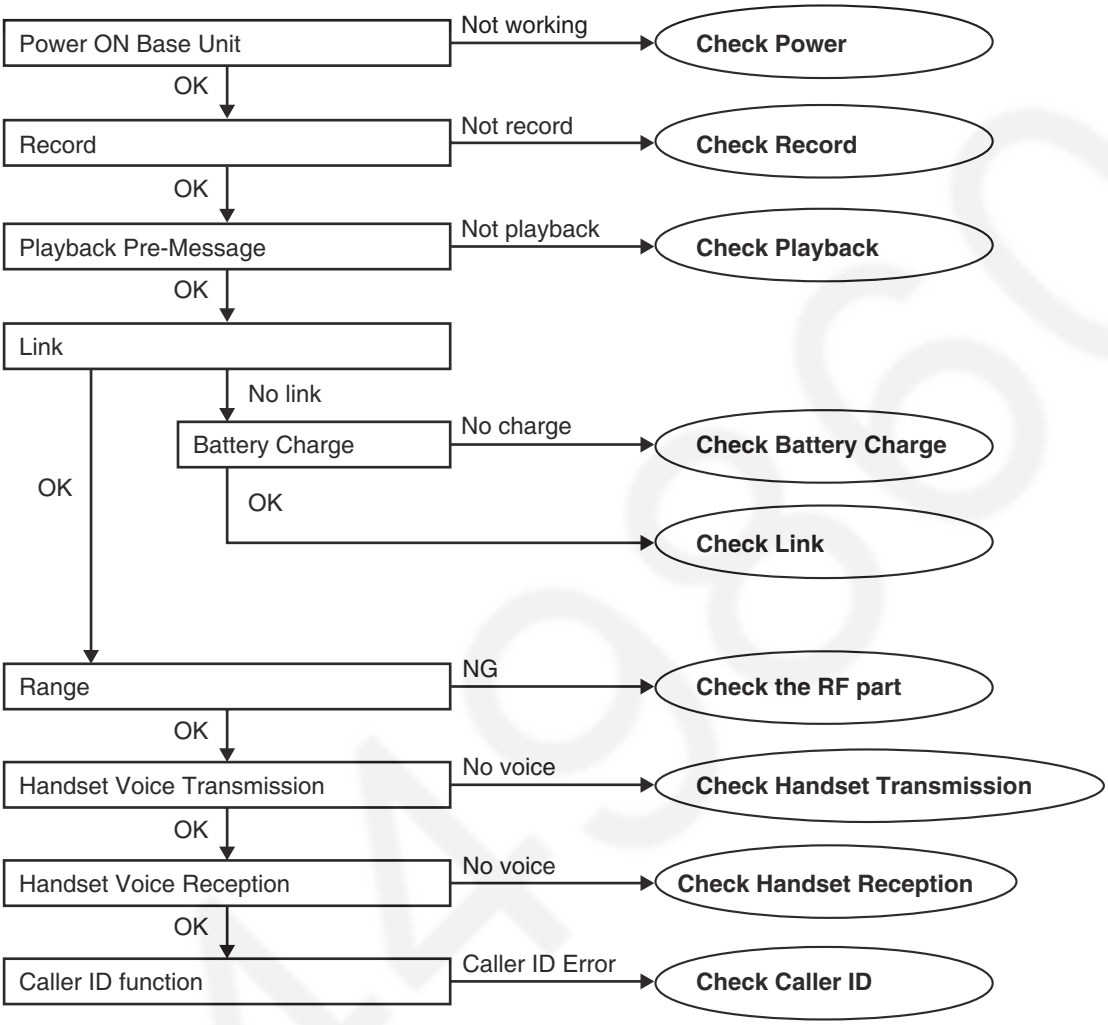
Note: (*2)

- 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 the Base Unit** (P.41).
- If users do not bring the base unit with them, the registration procedure has to be done by users themselves.

10 Troubleshooting Guide

10.1. Troubleshooting Flowchart

FLOW CHART

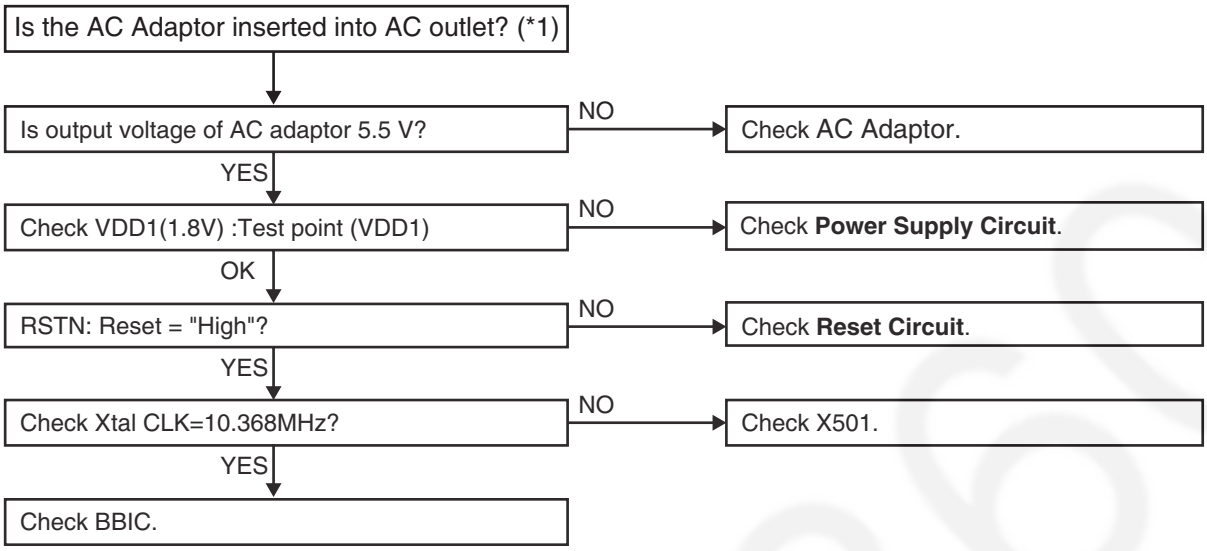


Cross Reference:

- **Check Power** (P.34)
- **Check Record** (P.35)
- **Check Playback** (P.36)
- **Check Battery Charge** (P.36)
- **Check Link** (P.37)
- **Check the RF part** (P.39)
- **Check Handset Transmission** (P.42)
- **Check Handset Reception** (P.42)
- **Check Caller ID** (P.42)

10.1.1. Check Power

10.1.1.1. Base Unit



Cross Reference:

Power Supply Circuit/Reset Circuit (P.13)

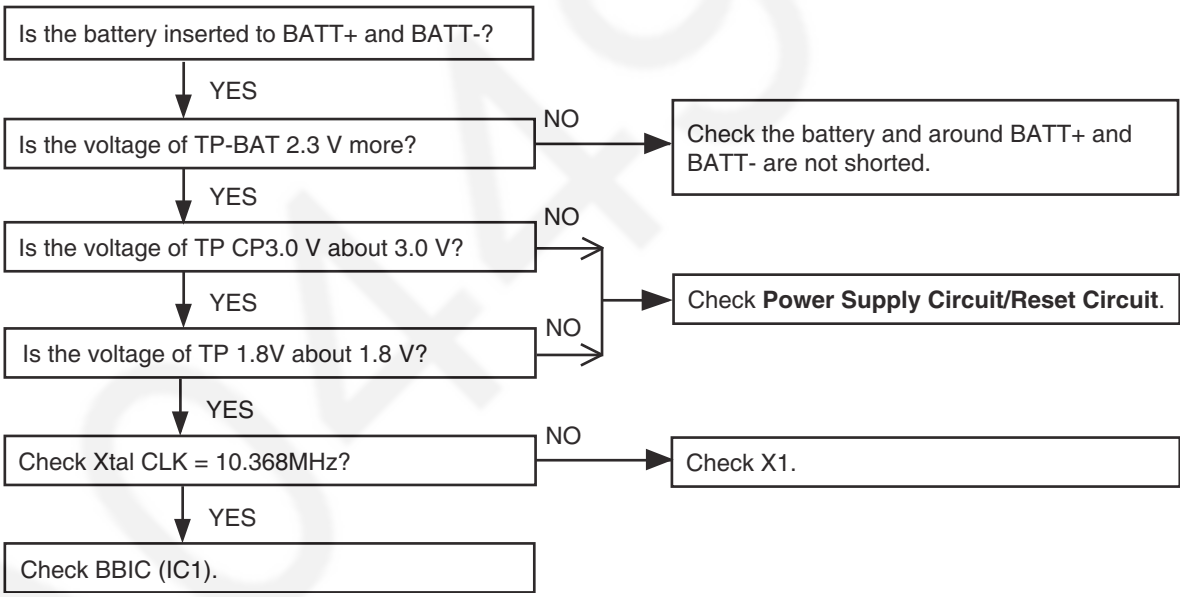
Note:

BBIC is IC501.

(*1) Refer to **Specifications** (P.6) for part number and supply voltage of AC adaptor.

(*2) Refer to **Circuit Board (Base Unit_Main)** (P.79).

10.1.1.2. Handset



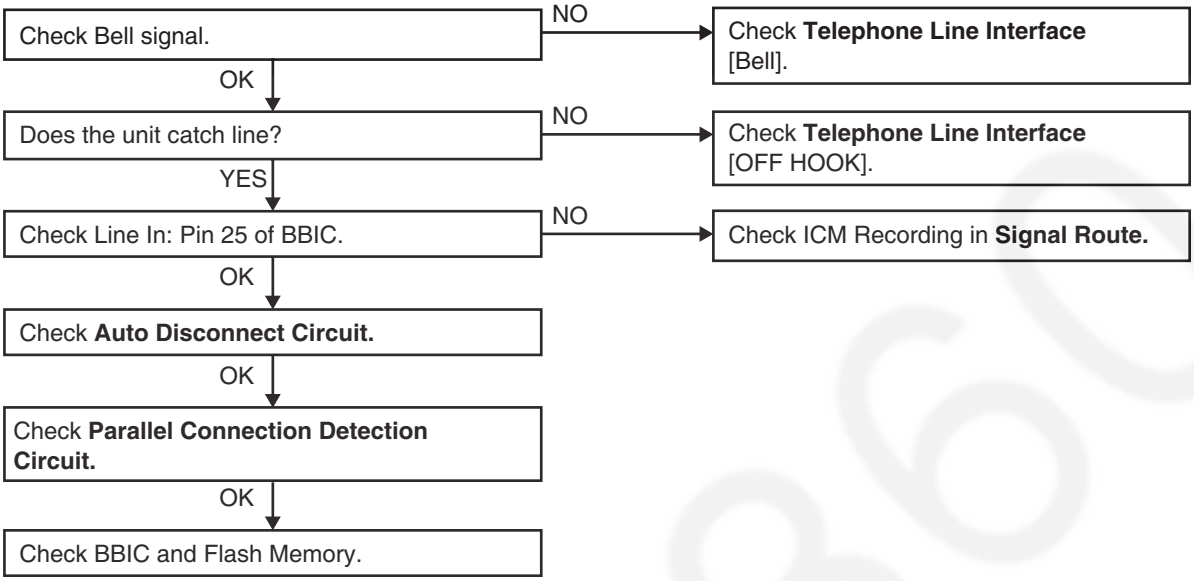
Cross Reference:

Power Supply Circuit/Reset Circuit (P.20)

10.1.2. Check Record

10.1.2.1. Base Unit

Not record Incoming Message



Cross Reference:

Signal Route (P.23)

Telephone Line Interface (P.15)

Parallel Connection Detect Circuit/Auto Disconnect Circuit (P.16)

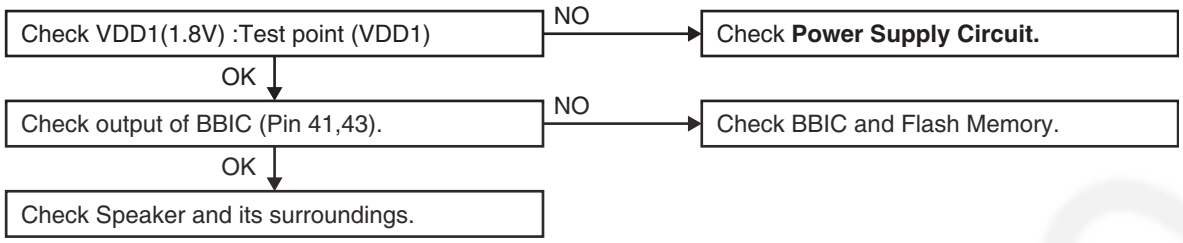
Note:

Flash Memory is IC601.

BBIC is IC501.

10.1.3. Check Playback

10.1.3.1. Base Unit

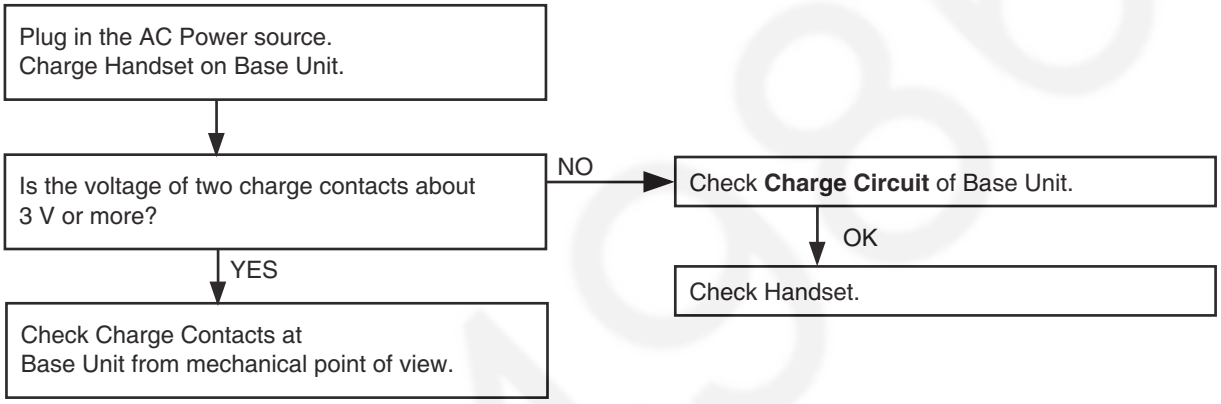


Cross Reference:
Power Supply Circuit/Reset Circuit (P.13)

Note:
Flash Memory is IC601.
BBIC is IC501.
(*1) Refer to **Circuit Board (Base Unit_Main)** (P.79).

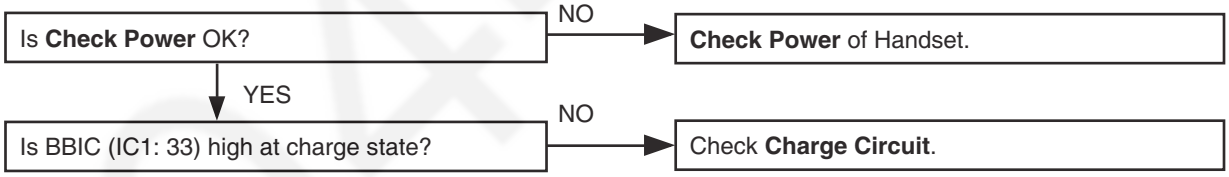
10.1.4. Check Battery Charge

10.1.4.1. Base Unit



Cross Reference:
Charge Circuit (P.14)

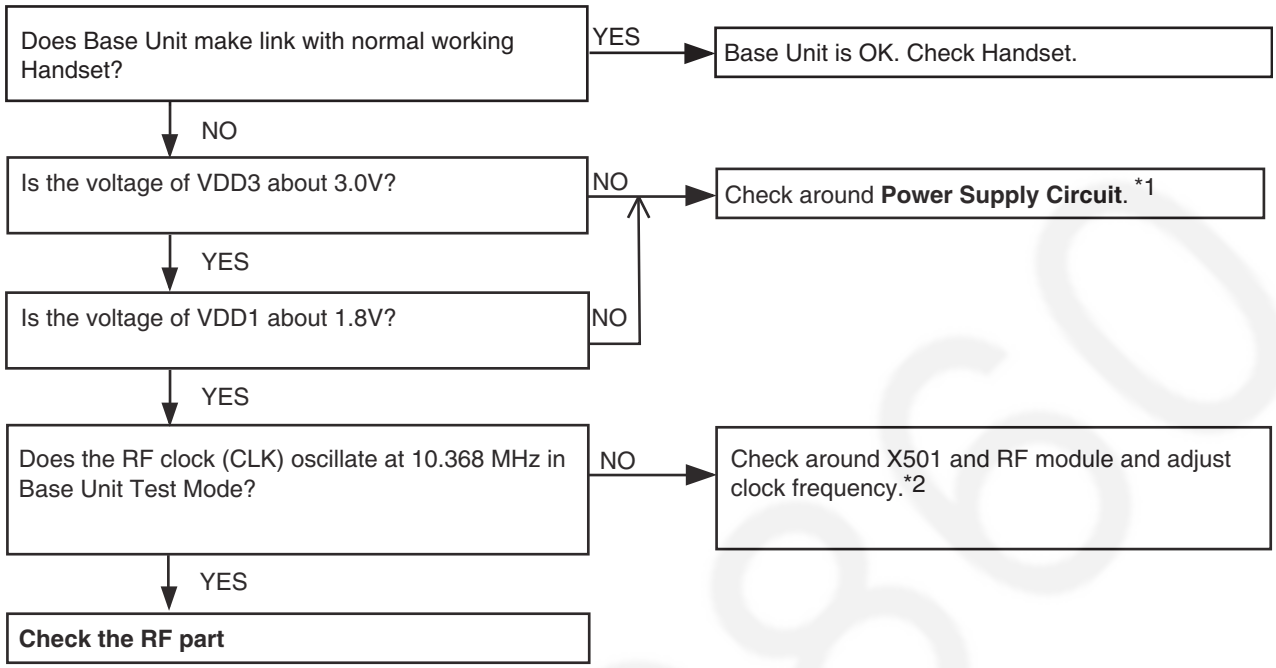
10.1.4.2. Handset



Cross Reference:
Check Power (P.34)
Charge Circuit (P.21)

10.1.5. Check Link

10.1.5.1. Base Unit



Cross Reference:

Power Supply Circuit/Reset Circuit (P.13)

Check the RF part (P.39)

Note:

*1 VDD1 can be adjusted.

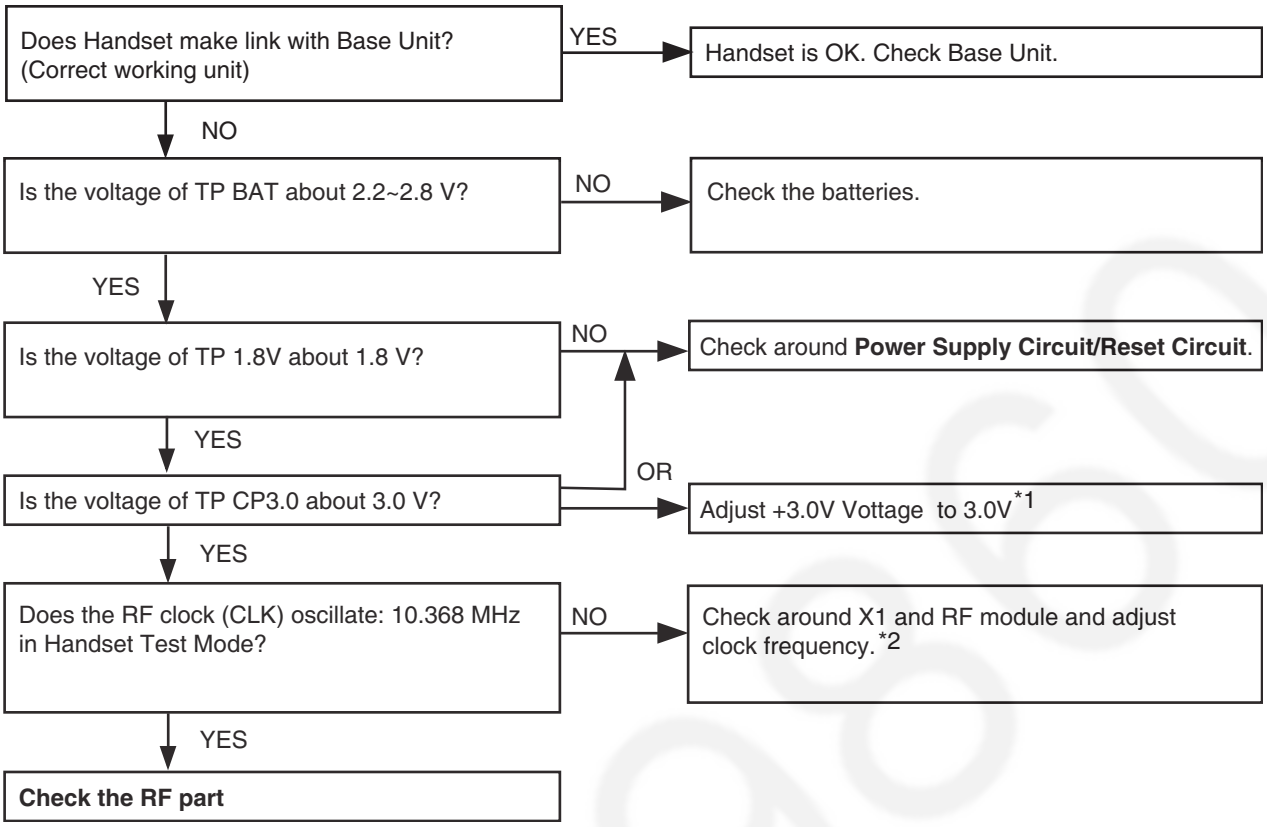
Refer to **Adjustment of Base Unit** (P.53).

*2 How to adjust the frequency of X501:

To see the frequency, execute the command “SFR“, then check the TP_CKM (IC501-57pin).

To adjust frequency, refer to **Adjustment of Base Unit** (P.53).

10.1.5.2. Handset



Cross Reference:

Power Supply Circuit/Reset Circuit (P.20)

Check the RF part (P.39)

Note:

*1 3.0V can be adjusted along with bandgap voltage adjustment.

Refer to **Adjustment of Handset** (P.54).

*2 How to adjust the frequency of X1:

To see the frequency, execute the command “SFR“, then check the TP_CKM (IC1-57pin).

To adjust frequency, refer to **Adjustment of Handset** (P.54).

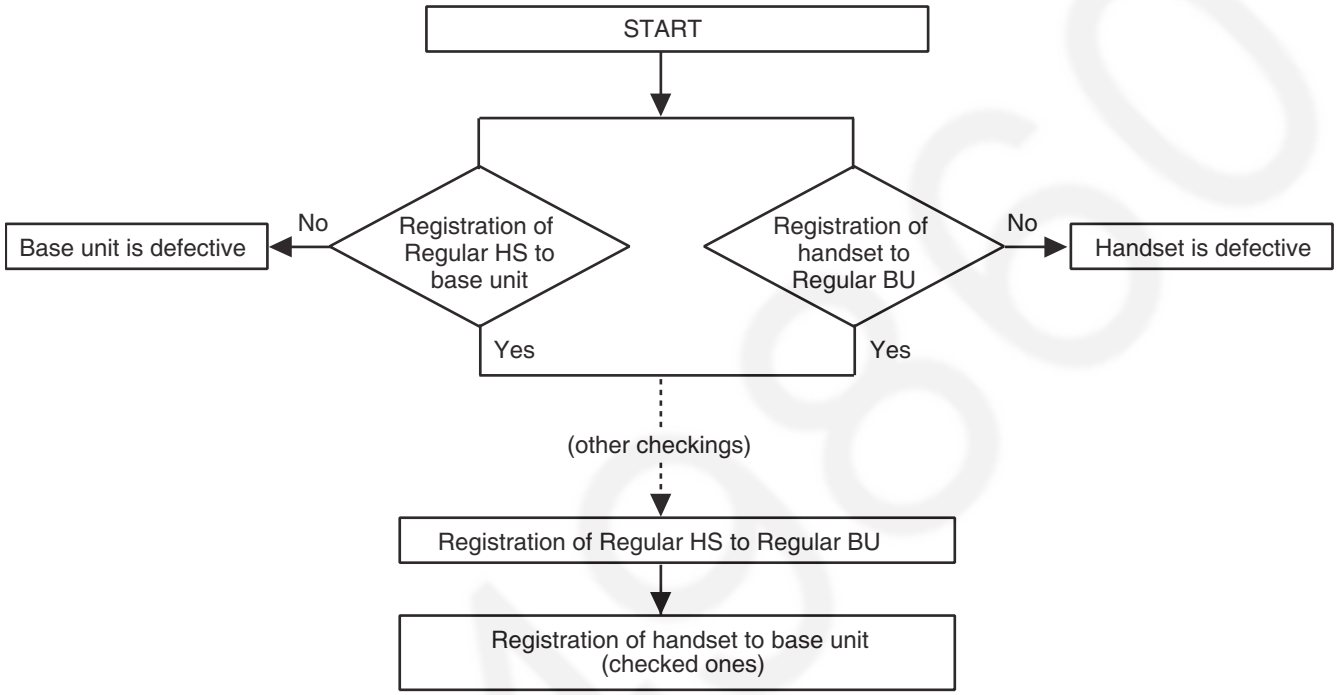
10.1.6. Check the RF part

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.



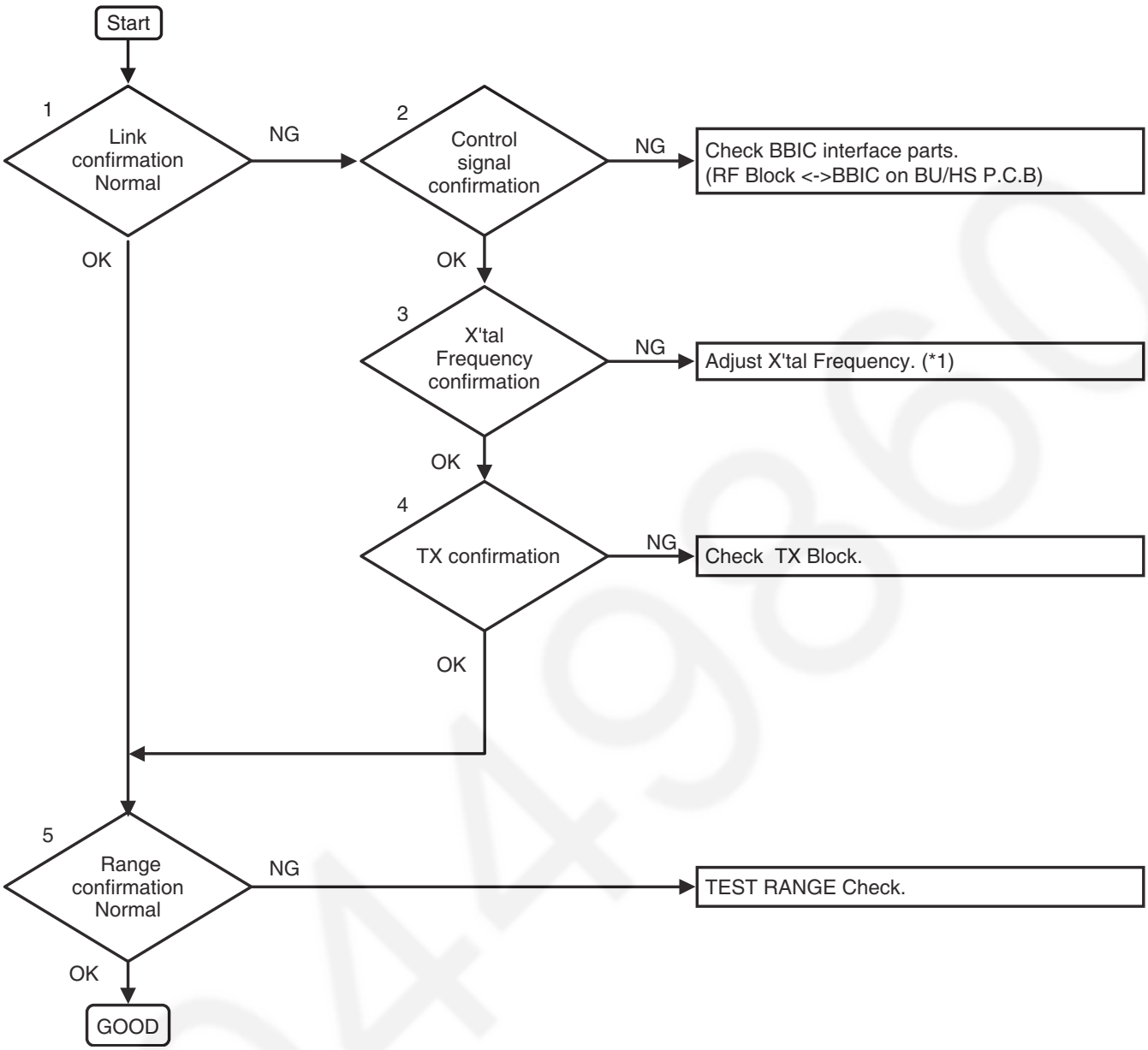
Note:

(*1) HS: Handset

(*2) BU: Base Unit

10.1.6.2. RF Check Flowchart

Please refer to the each item.



Note:

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

10.1.7. Registering a Handset to the Base Unit

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.

10.1.8. Deregistering All Handsets by the Base Unit

1 **【MENU】** → #131
- All handsets registered to the base unit are displayed.

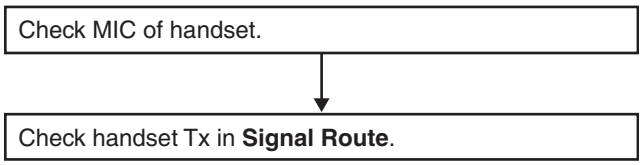
2 **【▲▼】**: Select the handset you want to cancel. → **【OK】**
3 **【▲▼】**: **"Yes"** → **【OK】**
4 **【OFF】**

10.1.9. Copying All Entries

1 **【📖】** → **【MENU】**
2 **【▲▼】**: **"Copy All"** → **【OK】**
3 **【▲▼】**: Select the handset you want to send the phonebook entry to. → **【OK】**
- When all entries have been copied, **"Completed"** is displayed.

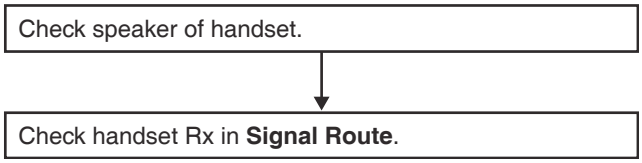
4 **【OFF】**

10.1.10. Check Handset Transmission



Cross Reference:
Signal Route (P.23)

10.1.11. Check Handset Reception

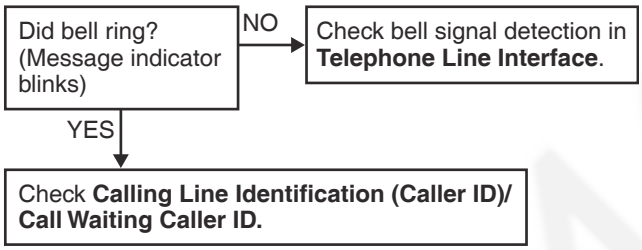


Cross Reference:
Signal Route (P.23)

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

10.1.12. Check Caller ID

BASE UNIT



Cross Reference:
Telephone Line Interface (P.15)
Calling Line Identification (Caller ID)/Call Waiting Caller ID (P.17)

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.

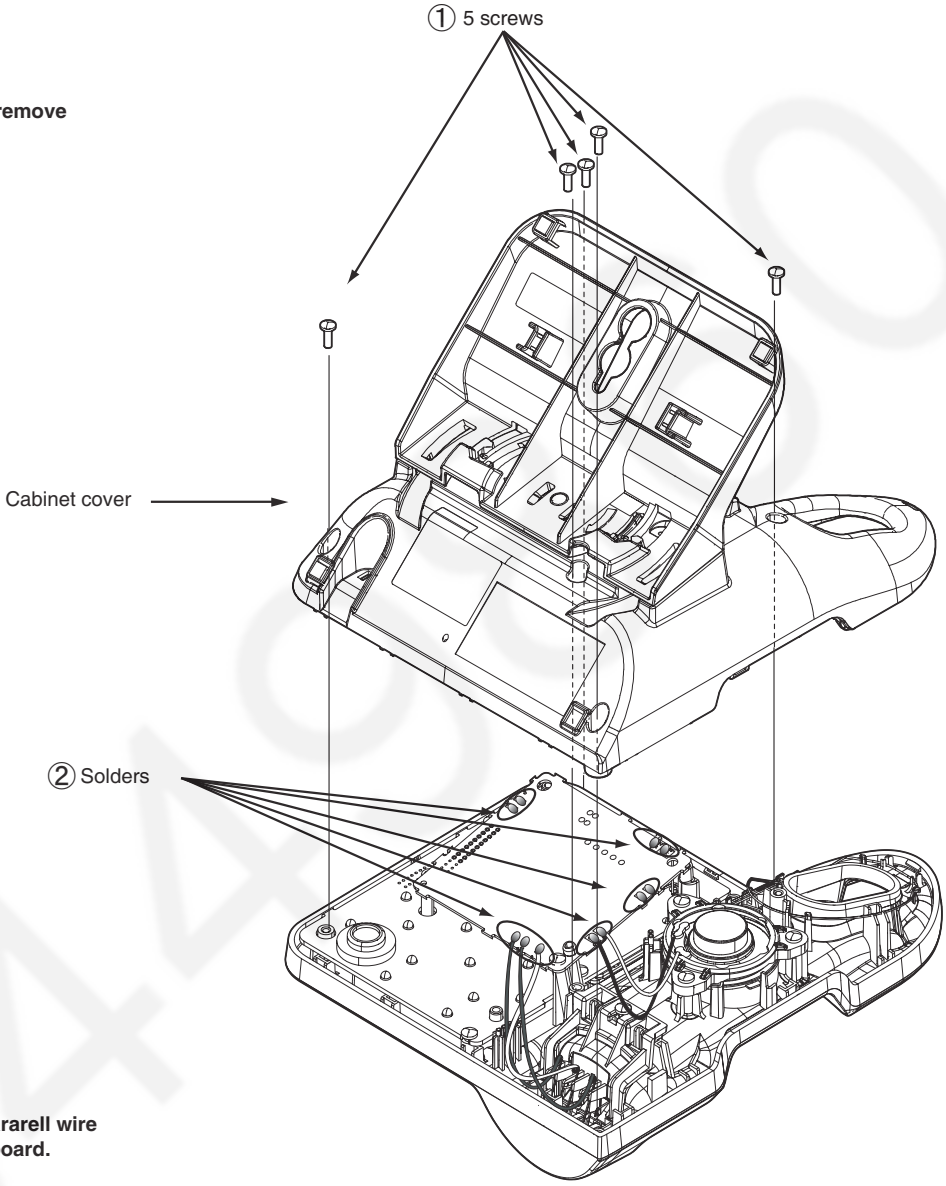
11 Disassembly and Assembly Instructions

11.1. Disassembly Instructions

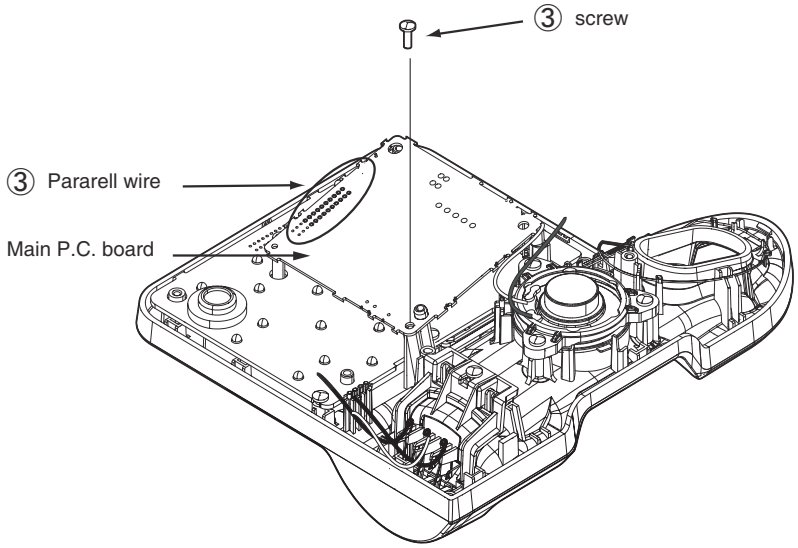
11.1.1. Base Unit

① **Remove the 5 screws to remove the cabinet cover.**

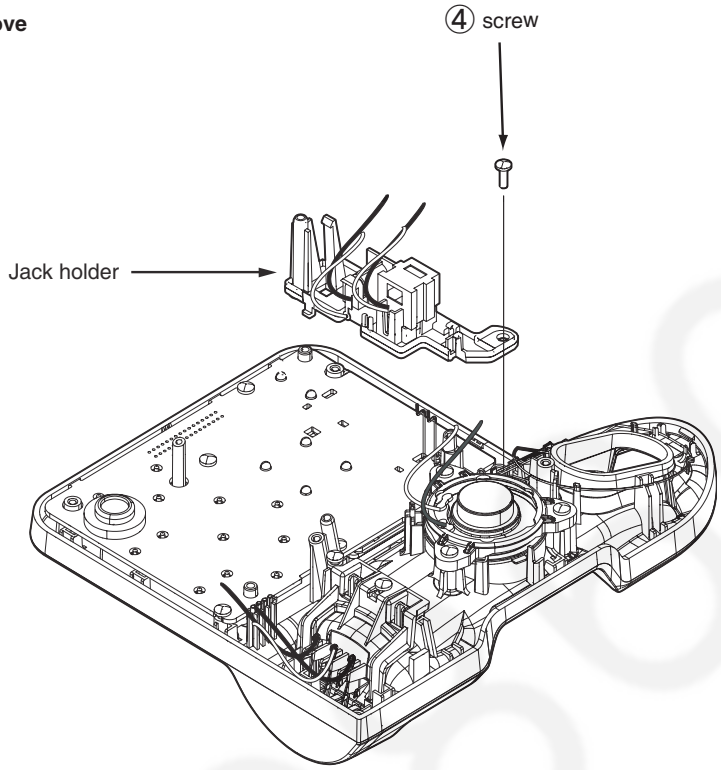
② **Remove the solders.**



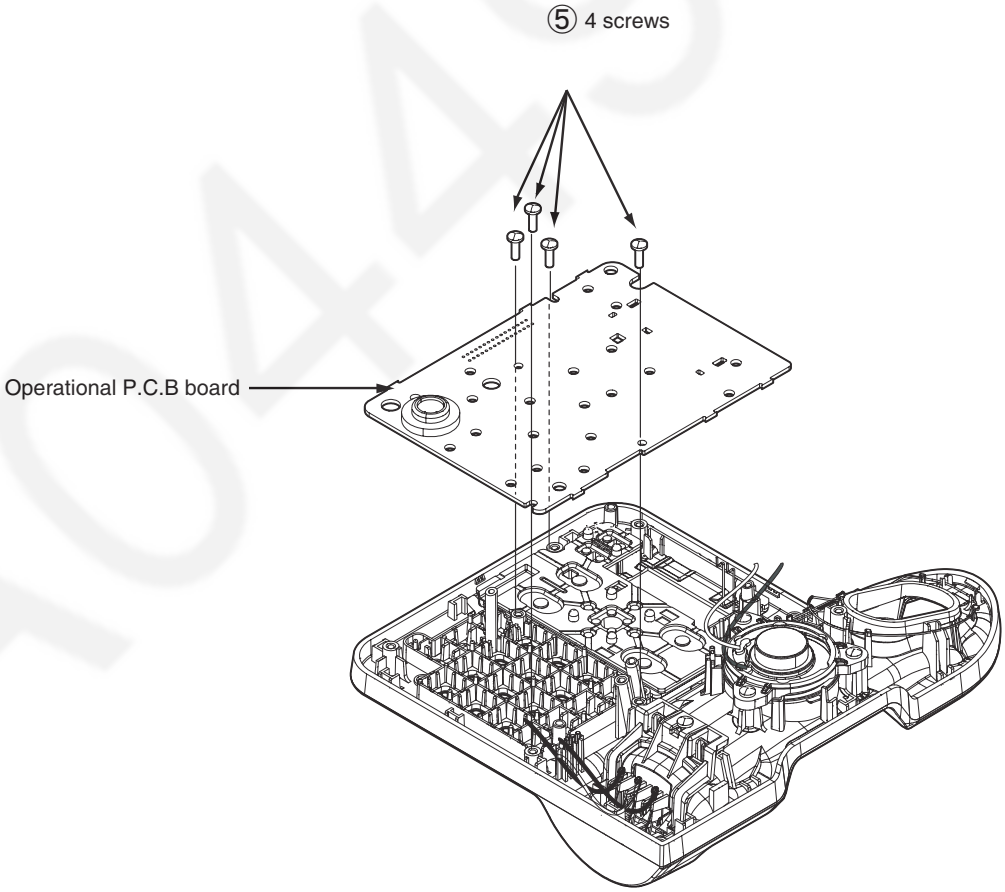
③ **Remove the screw and pararell wire to remove the main P.C. board.**



④ **Remove the screw to remove the Jack holder.**

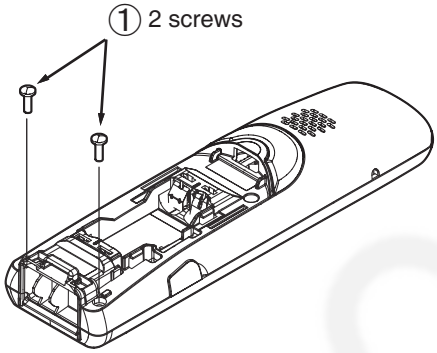


⑤ **Remove the 4 screws and pararell wire to remove the operational P.C.B board.**

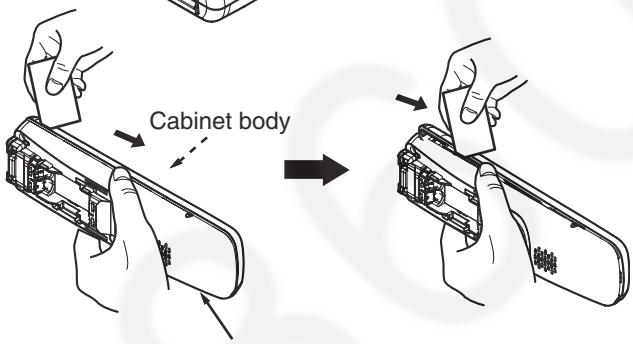


11.1.2. Handset

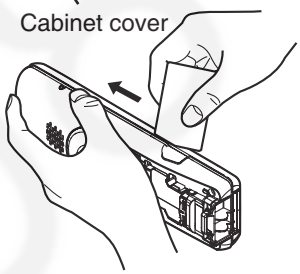
① **Remove the 2 screws.**



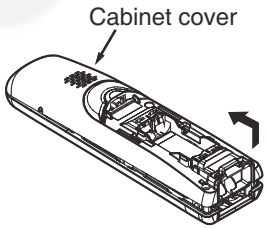
② **Insert a plastic card. (Ex. Used SIM card etc.) between the cabinet body and the cabinet cover, then pull it along the gap to open the cabinet.**



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



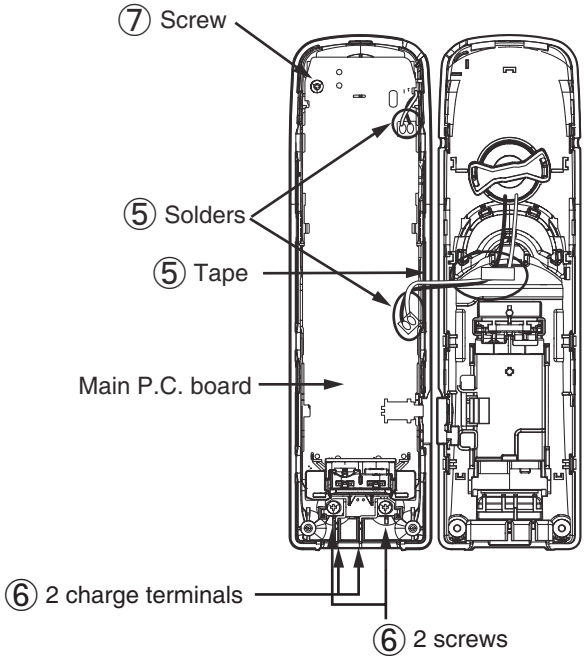
④ **Remove the cabinet cover by pushing it upward.**



⑤ **Remove the solders and tape.**

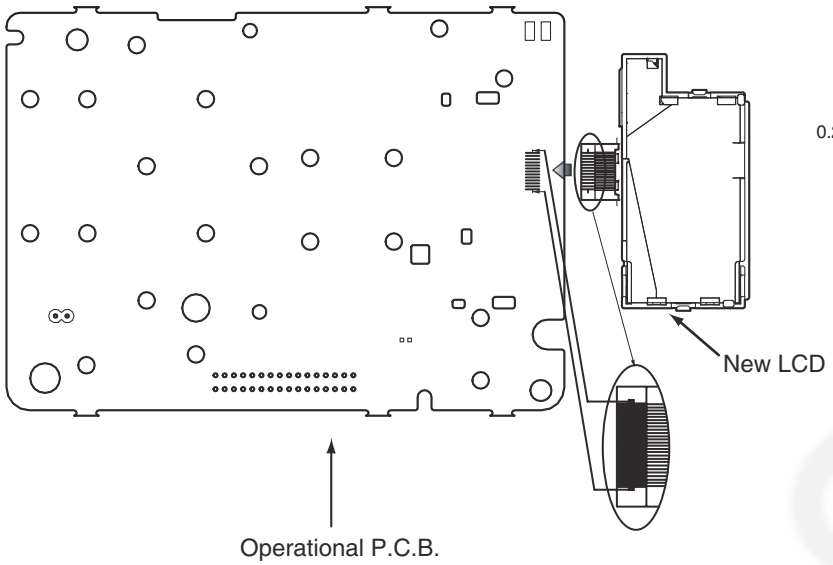
⑥ **Remove the 2 screws to remove the 2 charge terminals.**

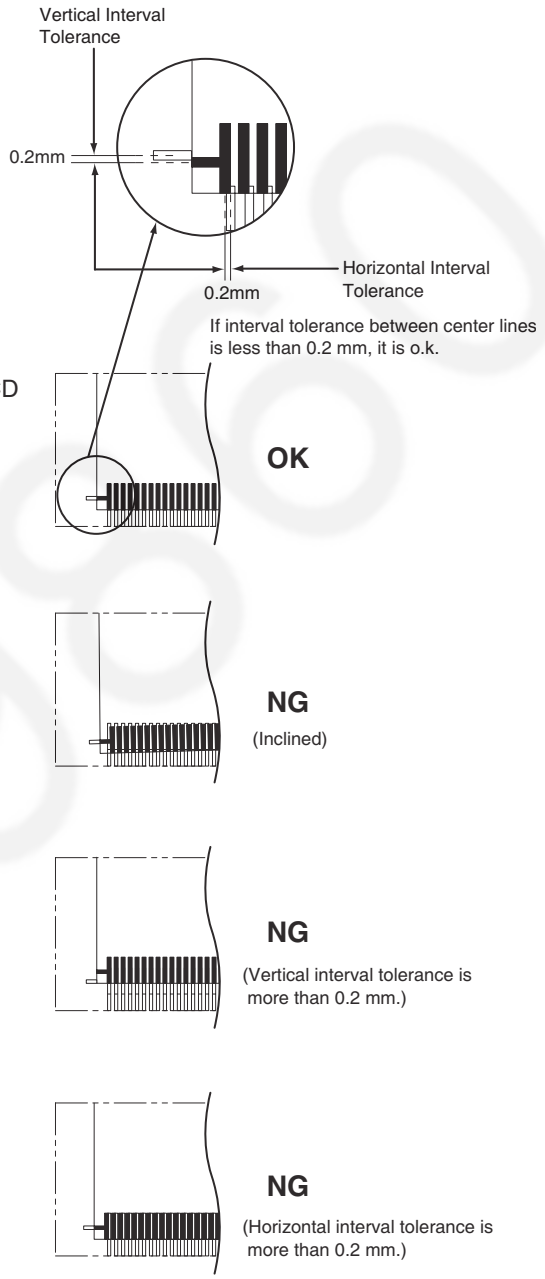
⑦ **Remove the screw to remove the main P. C. board.**



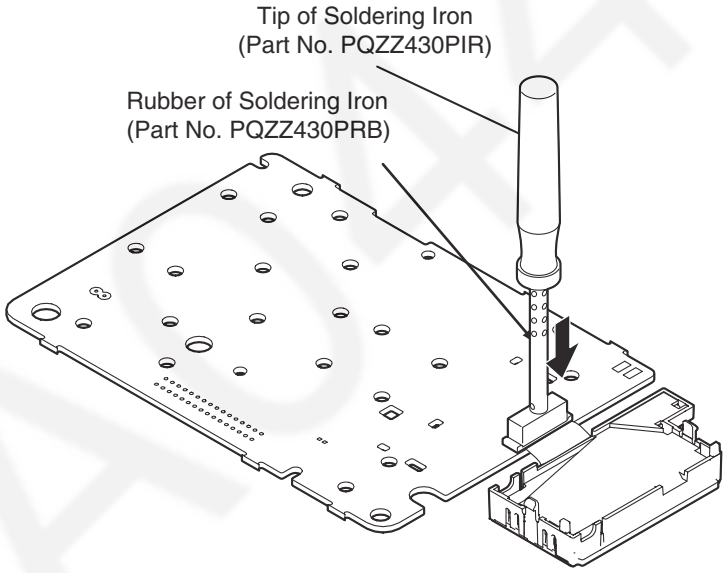
11.2. How to Replace the Base unit LCD

① Fit the heatseal of a new LCD.

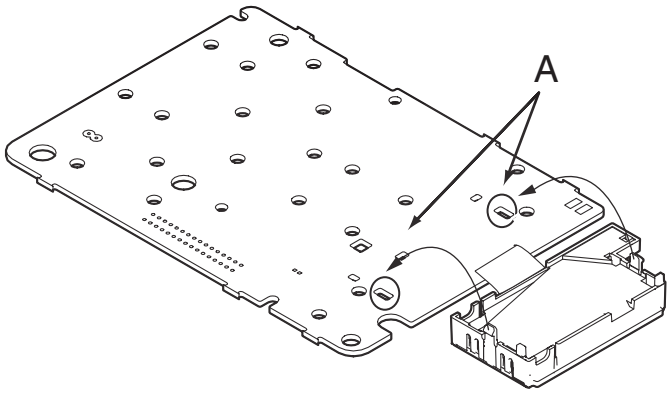




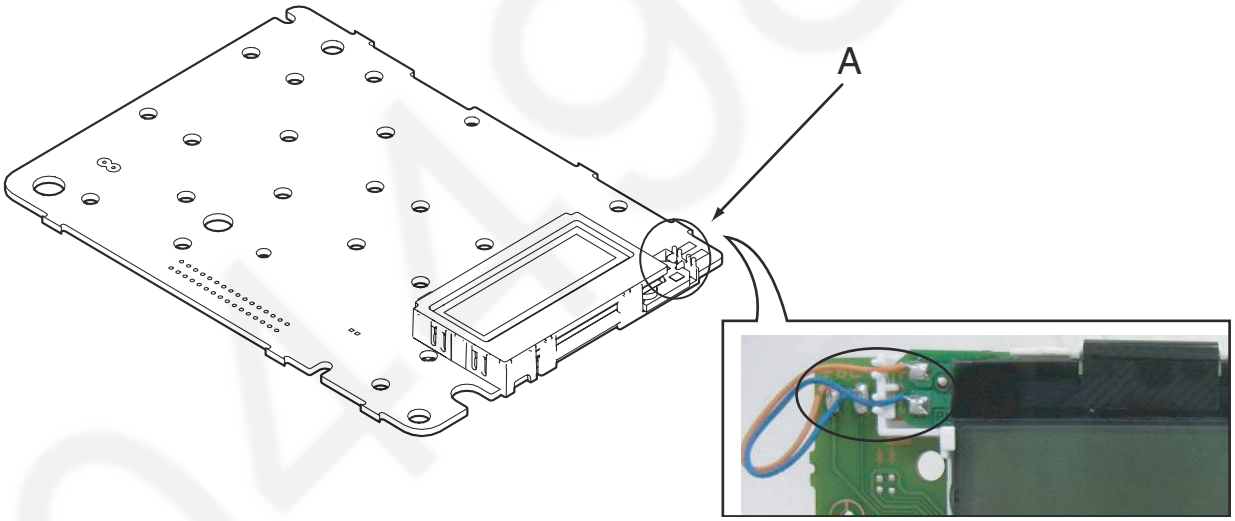
② Heatweld with the tip of the soldering iron about 5 to 8 seconds (in case of 60W soldering iron).



③ Attach the LCD and fix by hook A (two points).



④ Solder the wires.

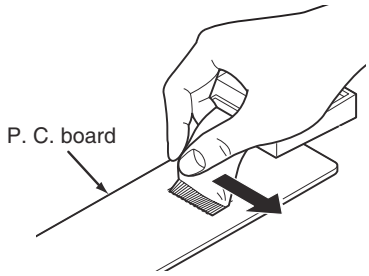


11.3. How to Replace the Handset LCD

Note:

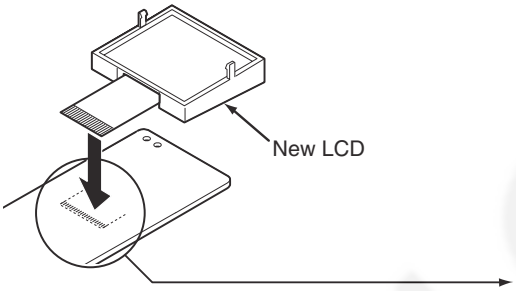
The illustrations are simplified in this page.
They may differ from the actual product.

①

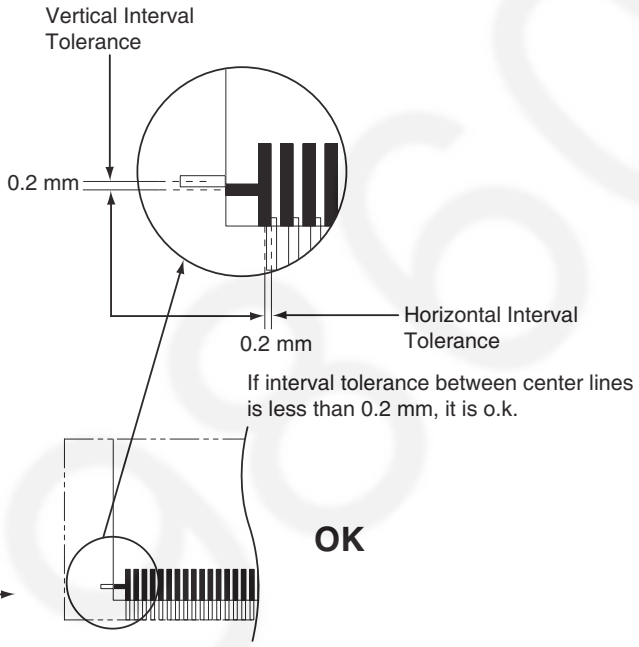


Peel off the FFC (Flexible Flat Cable) from the LCD, in the direction of the arrow. Take care to ensure that the foil on the P.C. board is not damaged.

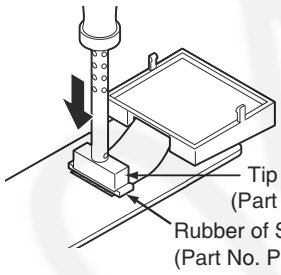
②



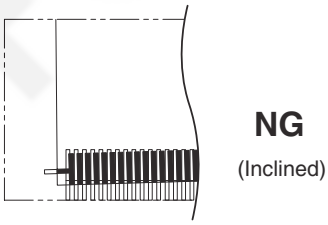
Fit the heatseal of a new LCD.

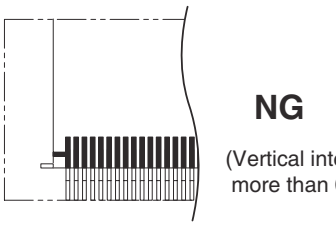


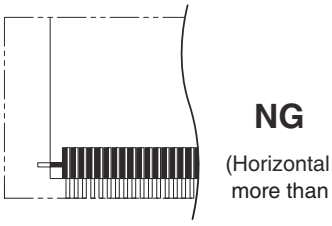
③



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







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.33)

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.
  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: PNZZTG3821BX

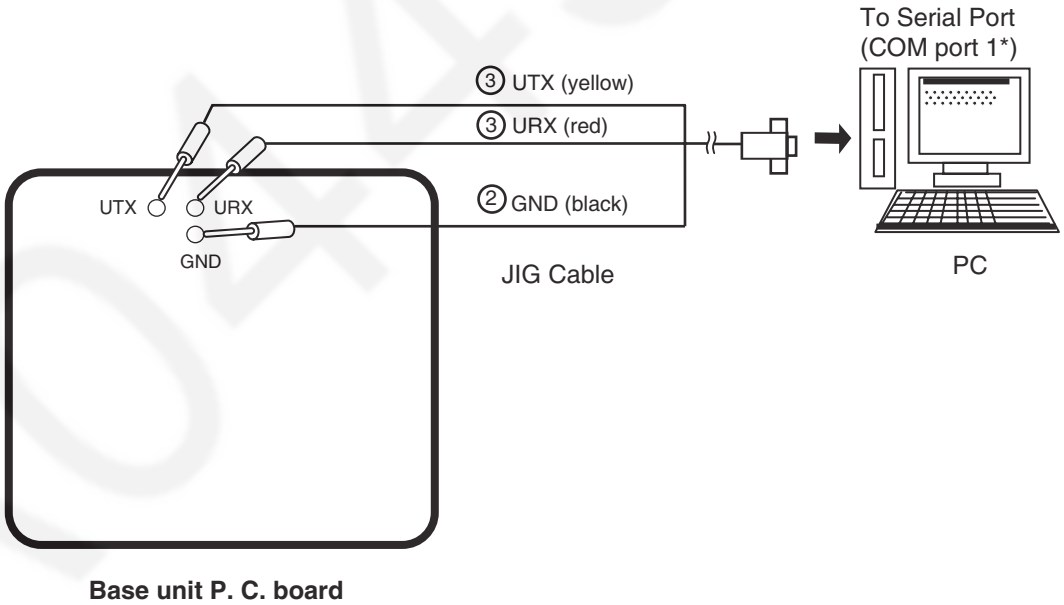
Note:

*: 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 (kΩ)	New value (kΩ)
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).



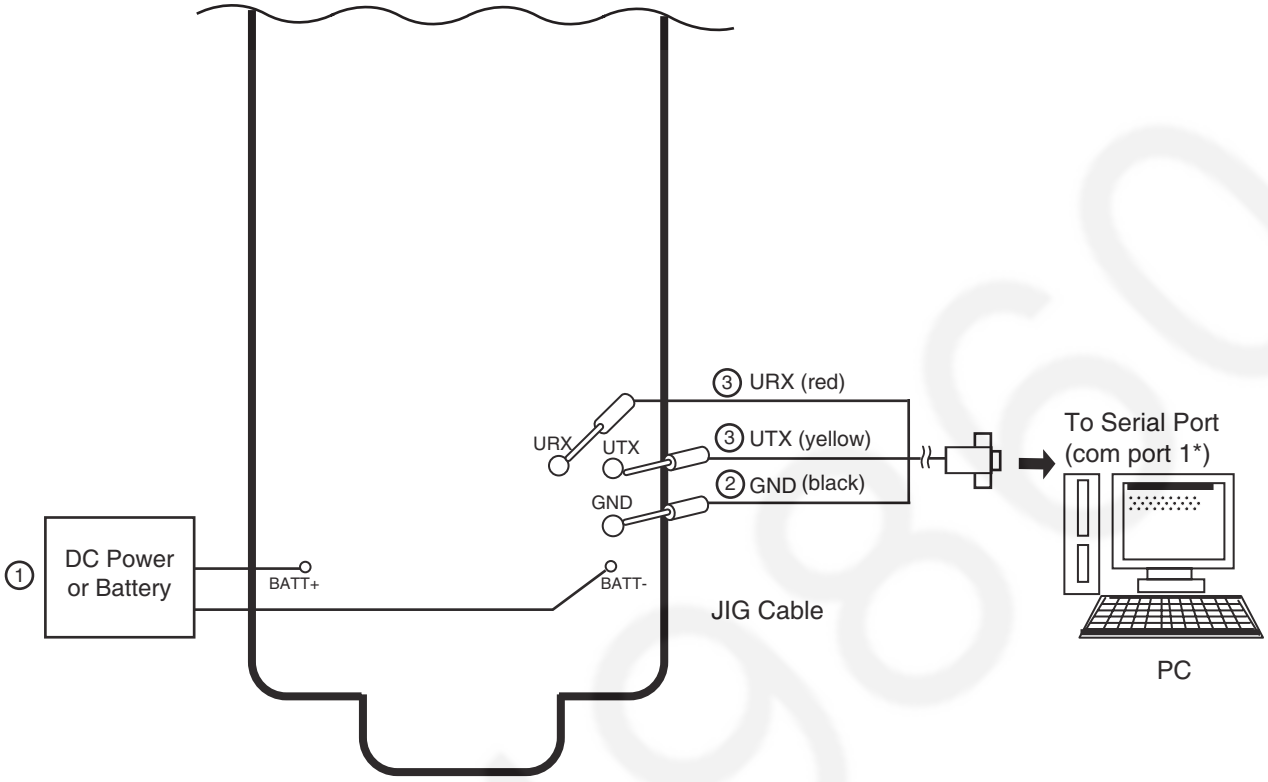
Base unit P. C. board

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	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.
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.

12.3. Adjustment of Base Unit

When IC501 (BBIC) or IC611 (EEPROM) is exchanged, the Bandgap adjustment and the Frequency adjustment are necessary.
When X501 (X'tal) is exchanged, the Frequency adjustment is necessary.

Procedure:

1. Open a window of MS-DOS mode from the start-up menu.
2. Change directory to the copied folder.
3. Type "**SET_COM 1**" from the keyboard (when COM port 1 is used for the connection).
4. Type "**sendchar RFR**". Check ID code on PC screen.
   If OK (ID is displayed), go to advances to the adjustment process.
   If NG (ID is not displayed), you have to stop this procedure, and check your PC environment.

BandGAP Voltage Adjustment

1. Check BandGap voltage. (VDD1-GND)
2. If voltage value is 1.8 V ± 0.02 V then OK, go to **Frequency Adjustment** process.
   If voltage value is not 1.8 V ± 0.02 V then, go to step 3.
3. Type "**sendchar VDD**", you can check registered value of parameter.
   When you want to up the voltage: "Value+1".
   When you want to down the voltage: "Value-1".
4. Type "**sendchar VDD nn**", you can register a new parameter value.
5. Please operate step1 to 5 again until the voltage becomes it within the range.

Example

```
D:\PNZZTG****>sendchar VDD
08
D:\PNZZTG****>sendchar VDD 09
OK
D:\PNZZTG****>
```

Please confirm the following item when the adjustment does not go well.

Symptom	item
Can not Adjust Bandgap Voltage	Please check **Power Supply Circuit**.

When it does not improve even if the above-mentioned is confirmed, IC501 might be defective.
Please check soldering.

Frequency Adjustment

1. Type "sendchar SFR" then set to RF burst mode. (Respons "OK")
2. Check Frequency. (STM/CKM/P15 - GND)
3. If Frequency value is 10.368000 MHz ± 41 Hz then OK, finished Adjustment process
   - Please turn off the power of PCB board.
   If Frequency value is not 10.368000 MHz ± 41 Hz then, go to step 4.
4. You can check registered value of parameter.
   When you want to up the frequency: "Value -1".
   When you want to down the frequency: "Value +1".
5. Type "**sendchar SFR nn nn**", you can register a new parameter value.
6. Please operate step1 to 6 again until the Frequency becomes it within the range.

Example

```
D:\PNZZTG****>sendchar SFR
0270
D:\PNZZTG****>sendchar SFR 02␣71
OK
D:\PNZZTG****>
```

Please confirm the following item when the adjustment does not go well.

Symptom	item
Can not Adjust RFCLK Frequency	Please check STM/CKM/P15 (R508)

When it does not improve even if the above-mentioned is confirmed, IC501 might be defective.
Please check soldering.

Cross Reference:
Power Supply Circuit/Reset Circuit (P.13)

12.4. Adjustment of Handset

When IC5(BBIC) or IC3 (EEPROM) is exchanged, the Bandgap adjustment and the Frequency adjustment are necessary.
When X1 (X'tal) is exchanged, the Frequency adjustment is necessary.

Procedure:

1. Open a window of MS-DOS mode from the start-up menu.
2. Change directory to the copied folder.
3. Type "**SET_COM 1**" from the keyboard (when COM port 1 is used for the connection).
4. Type "**sendchar IDR**". Check ID code on PC screen.
   If OK (ID is displayed), go to advances to the adjustment process.
   If NG (ID is not displayed), you have to stop this procedure, and check your PC environment.

BandGAP Voltage Adjustment

1. Check BandGap voltage. (TP: +1.8V- GND)
2. If voltage value is 1.8 V ± 0.02 V then OK, go to **Frequency Adjustment** process.
   If voltage value is not 1.8 V ± 0.02 V then, go to step 3.
3. Type "**sendchar VDD**", you can check registered value of parameter.
   When you want to up the voltage: "Value+1".
   When you want to down the voltage: "Value-1".
4. Type "**sendchar VDD nn**", you can register a new parameter value.
5. Please operate step1 to 5 again until the voltage becomes it within the range.

Example

```
D:\PNZZTG****>sendchar VDD
08
D:\PNZZTG****>sendchar VDD
OK
D:\PNZZTG****>
```

Please confirm the following item when the adjustment does not go well.

Symptom	item
Can not Adjust Bandgap Voltage	Please check **Power Supply Circuit**.

When it does not improve even if the above-mentioned is confirmed, IC5 might be defective.
Please check soldering.

Frequency Adjustment

1. Type "sendchar SFR" then set to RF burst mode. (Respons "OK")
2. Check Frequency. (TP: CKM-GND)
3. If Frequency value is 10.368000 MHz ± 41 Hz then OK , finished Adjustment process
   - Please turn off the power of PCB board.
   If Frequency value is not 10.368000 MHz ± 41 Hz then, go to step 4.
4. You can check registered value of parameter.
   When you want to up the frequency: "Value -1".
   When you want to down the frequency: "Value +1".
5. Type "**sendchar SFR nn nn**", you can register a new parameter value.
6. Please operate step1 to 6 again until the Frequency becomes it within the range.

Example

```
D:\PNZZTG****>sendchar SFR
0270
D:\PNZZTG****>sendchar SFR ␣02 ␣7A
OK
D:\PNZZTG****>
```

Please confirm the following item when the adjustment does not go well.

Symptom	item
Can not Adjust RFCLK Frequency	Please check CKM (R20)

When it does not improve even if the above-mentioned is confirmed, IC5 might be defective.
Please check soldering.

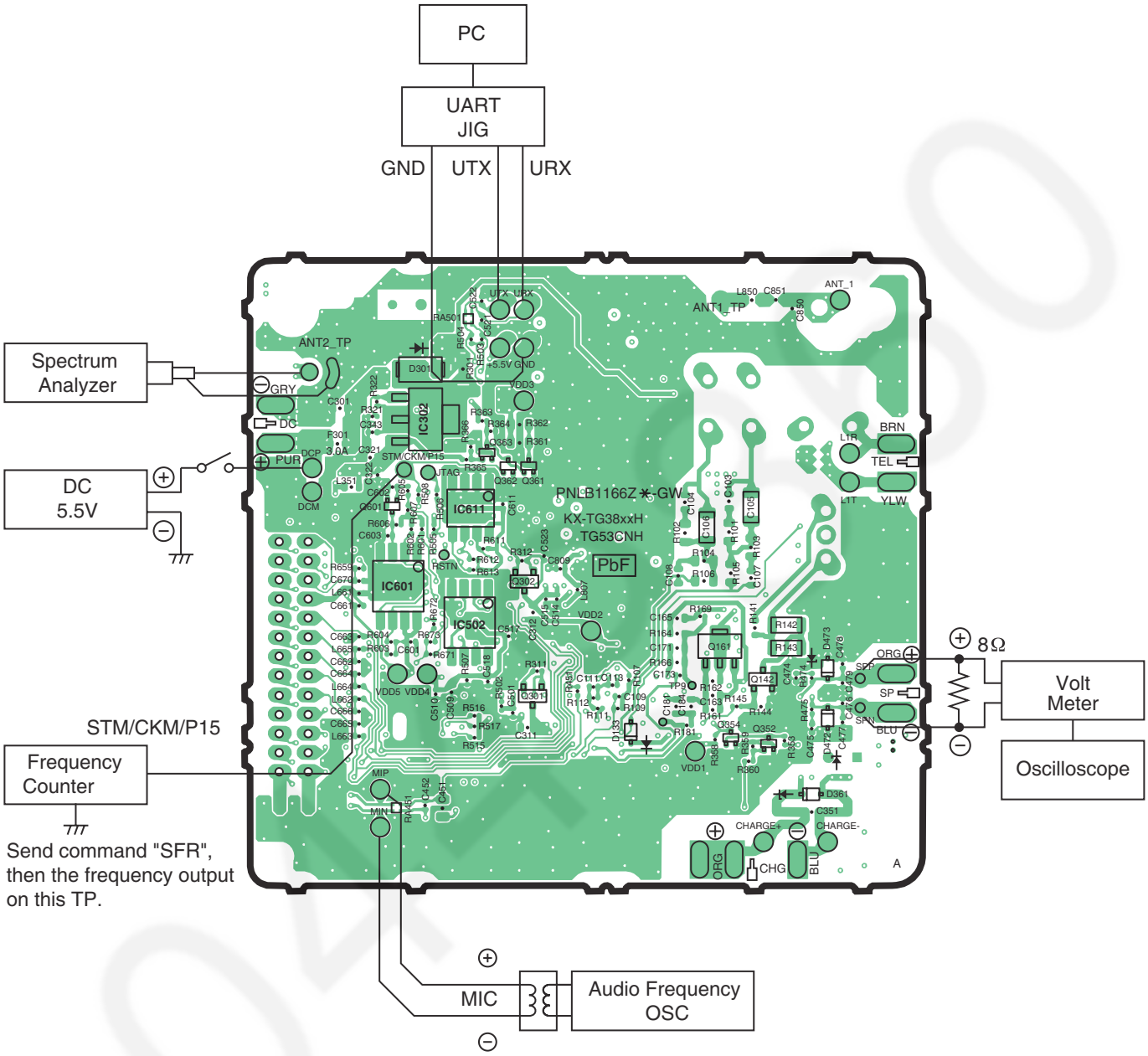
Battery Monitor Check	1. Apply 2.25V between BATT+ and BATT-. 2. Execute the command sendchar PAD sendchar LED 0 sendchar CRX 0 1 sendchar AD1 It assumes that the returnvalue is XX. a) 6c ≤ XX ≤ 71: No need to adjust b) XX: 6A ~ 6B: Need to adjust XX: 72 ~74: Need to adjust Write AD value of 2.25 V to 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 No Voltage writing data limit is "00". c) XX: 00 ~ 69: Reject XX: 75 ~ FF: Reject
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 0.08 V between BATT+ and BATT-. 4. Confirm that there is flashing of Battery Icon.

Cross Reference:
Power Supply Circuit/Reset Circuit (P.20)

12.5. Adjustment Standard (Base Unit)

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

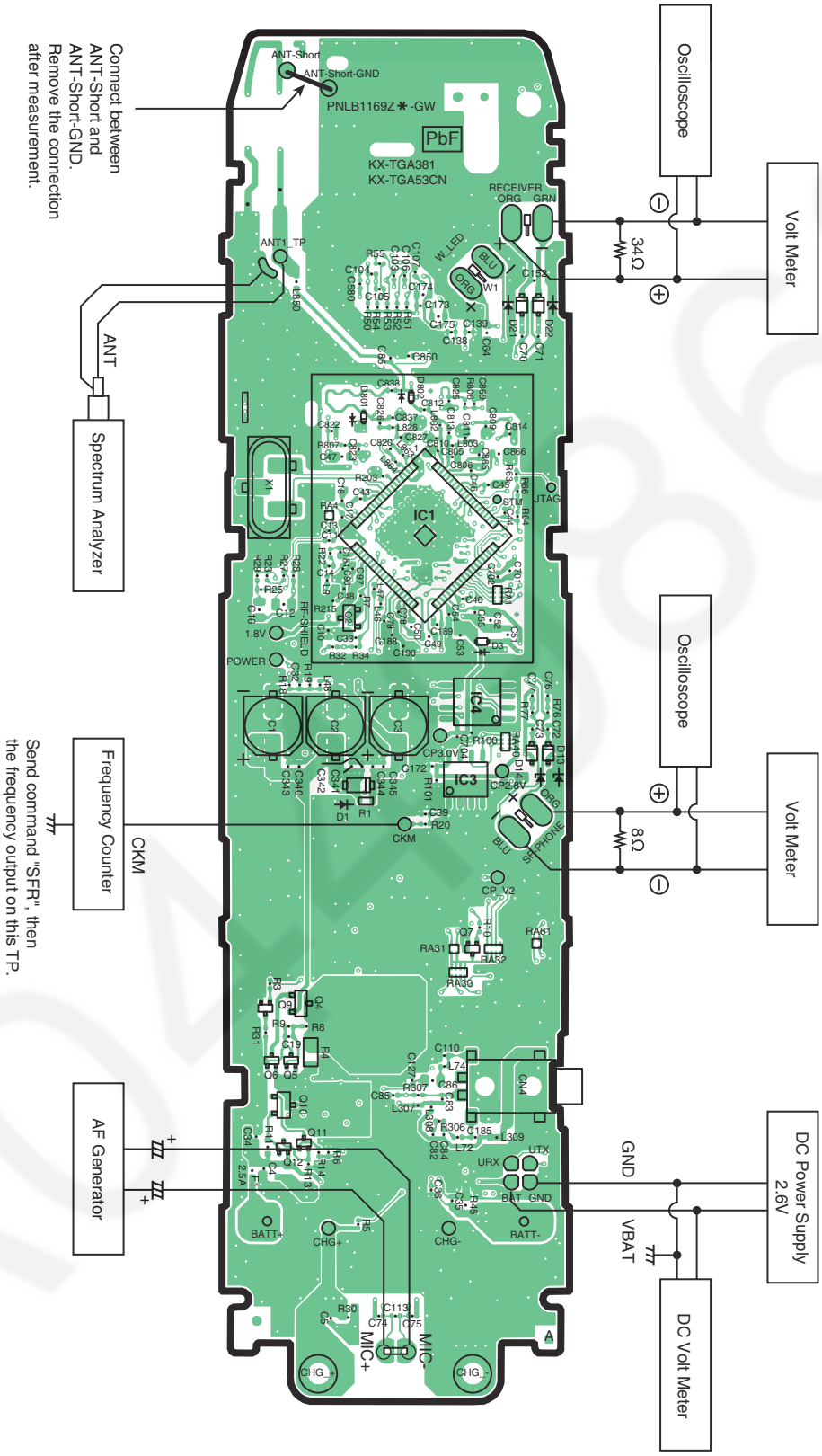
12.5.1. Bottom View



12.6. Adjustment Standard (Handset)

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

12.6.1. Component View



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

If repairing or replacing EEPROM or 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.

12.7.1. How to download the data

12.7.1.1. Base Unit

First, operate the PC setting according to **The Setting Method of JIG** (P.49).
Then download the appropriate data according to the following procedures.

Items		How to download/Required adjustment
FLASH (IC502)	Programming data is stored in memory.	1) Make sure to connect the JIG cable, then 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). 9) Default batch file: Execute the command “default.bat”. 10) Country version batch file: Execute the command “TG3821_BX_RevXXX_YYY.bat”. (*1) 11) Bandgap voltage & frequency adjustment: Refer to **Adjustment of Base Unit** (P.53).
EEPROM (IC611)	Adjusted parameter data is stored in memory. (country version batch file, default batch file, etc.)	1) Change the address “0001” of EEPROM to “55” to download the data. 2) Default batch file: Execute the command “default.bat”. 3) Country version batch file: Execute the command "TG3821_BX_RevXXX_YYY.bat". Bandgap voltage & frequency adjustment: Refer to **Adjustment of Base Unit** (P.53).
FLASH(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 -57600 ZZ.bin" (*1). 3) Wait until "VP file transfer complete." is displayed on the P.C. (writing time: aprox. About 1 min) 4) Detach the JIG cable to disconnect DC Power. Then reconnect the DC Power and confirm whether the download is successfully completed.
X'tal (X501)	System clock	Clock adjustment data is in EEPROM, adjust the data again after replacing it. 1) Frequency adjustment: Refer to **Adjustment of Base Unit** (P.53).

Note:

(*1) XXX_YYY: revision number, ZZ: Voice Prompt

“XXX_YYY” and “ZZ” vary depending on the country version. You can find them in the batch file, PNZZ- mentioned in **The Setting Method of JIG** (P.49).

12.7.1.2. Handset

First, operate the PC setting according to **The Setting Method of JIG** (P.49).
Then download the appropriate data according to the following procedures.

Items		How to download/Required adjustment
FLASH (IC4)	Program D/L	1) Make sure to connect the JIG cable, then disconnect the DC Power in order to download the data. 2) Execute the command “flw441 *********.hex”. 3) Connect the DC Power. 4) Press and hold the handset Power key. 5) While holding down the handset Power key, press the PC Enter key once. 6) After a few minutes, “Successful upgrade” is displayed on the PC indicating downloading has finished. 7) Detach the JIG cable, then press the handset Power key to turn it on. 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). 9) Default batch file: Execute the command “default.bat”. 10) Default batch file (remaining): Execute the command”TGA381_DEF_RevXXX_YYY.bat”. (*2). 11) Country version batch file: Execute the command “TGA381_BX_RevXXX_YYY.bat”. (*2). 12) Bandgap voltage, frequency adjustment, Battery monitor check & Battery Low confirmation: Refer to **Adjustment of Handset** (P.54).
EEPROM (IC3)	Adjusted parameter data is stored in memory. (country version batch file, default batch file, etc.)	1) Change the address “0001” of EEPROM to “55” to download the data. 2) Default batch file: Execute the command “default.bat”. 3) Default batch file (remaining): Execute the command “TGA381_DEF_RevXXX_YYY.bat”. (*2) 4) Country version batch file: Execute the command “TGA381_BX_RevXXX_YYY.bat”. (*2) 5) Bandgap voltage, frequency adjustment, Battery monitor check & Battery Low confirmation: Refer to **Adjustment of Handset** (P.54).
X'tal (X1)	System clock	Clock adjustment data is in EEPROM, adjust the data again after replacing it. 1) Frequency adjustment: Refer to **Adjustment of Handset** (P.54).

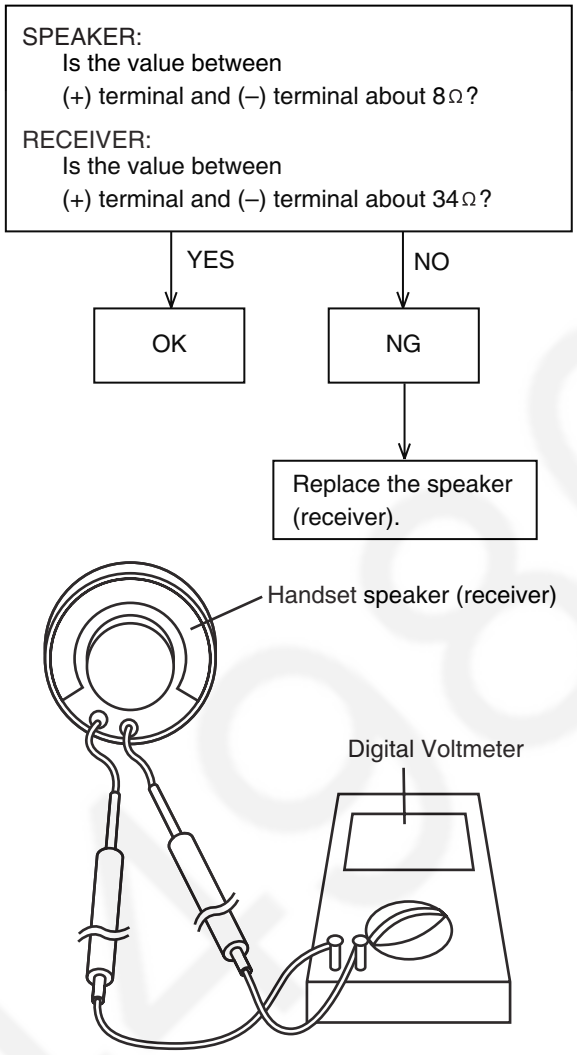
Note:

(*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.49).

12.8. How to Check the Handset 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.



12.9. Frequency Table (MHz)

Channel	Center Frequency (MHz)	RX Local Frequency (MHz)
2 (02H)	2402.784	2403.648
3 (03H)	2403.648	2404.512
4 (04H)	2404.512	2405.376
5 (05H)	2405.376	2406.24
6 (06H)	2406.24	2407.104
7 (07H)	2407.104	2407.968
8 (08H)	2407.968	2408.832
9 (09H)	2408.832	2409.696
10 (0AH)	2409.696	2410.56
11 (0BH)	2410.56	2411.424
12 (0CH)	2411.424	2412.288
13 (0DH)	2412.288	2413.152
14 (0EH)	2413.152	2414.016
15 (0FH)	2414.016	2414.88
16 (10H)	2414.88	2415.744
17 (11H)	2415.744	2416.608
18 (12H)	2416.608	2417.472
19 (13H)	2417.472	2418.336
20 (14H)	2418.336	2419.2
21 (15H)	2419.2	2420.064
22 (16H)	2420.064	2420.928
23 (17H)	2420.928	2421.792
24 (18H)	2421.792	2422.656
25 (19H)	2422.656	2423.52
26 (1AH)	2423.52	2424.384
27 (1BH)	2424.384	2425.248
28 (1CH)	2425.248	2426.112
29 (1DH)	2426.112	2426.976
30 (1EH)	2426.976	2427.84
31 (1FH)	2427.84	2428.704
32 (20H)	2428.704	2429.568
33 (21H)	2429.568	2430.432
34 (22H)	2430.432	2431.296
35 (23H)	2431.296	2432.16
36 (24H)	2432.16	2433.024
37 (25H)	2433.024	2433.888
38 (26H)	2433.888	2434.752
39 (27H)	2434.752	2435.616
40 (28H)	2435.616	2436.48
41 (29H)	2436.48	2437.344
42 (2AH)	2437.344	2438.208
43 (2BH)	2438.208	2439.072
44 (2CH)	2439.072	2439.936
45 (2DH)	2439.936	2440.8
46 (2EH)	2440.8	2441.664
47 (2FH)	2441.664	2442.528
48 (30H)	2442.528	2443.392
49 (31H)	2443.392	2444.256
50 (32H)	2444.256	2445.12
51 (33H)	2445.12	2445.984
52 (34H)	2445.984	2446.848
53 (35H)	2446.848	2447.712
54 (36H)	2447.712	2448.576
55 (37H)	2448.576	2449.44
56 (38H)	2449.44	2450.304
57 (39H)	2450.304	2451.168
58 (3AH)	2451.168	2452.032
59 (3BH)	2452.032	2452.896
60 (3CH)	2452.896	2453.76
61 (3DH)	2453.76	2454.624
62 (3EH)	2454.624	2455.488
63 (3FH)	2455.488	2456.352
64 (40H)	2456.352	2457.216
65 (41H)	2457.216	2458.08
66 (42H)	2458.08	2458.944
67 (43H)	2458.944	2459.808
68 (44H)	2459.808	2460.672
69 (45H)	2460.672	2461.536
70 (46H)	2461.536	2462.4
71 (47H)	2462.4	2463.264
72 (48H)	2463.264	2464.128
73 (49H)	2464.128	2464.992
74 (4AH)	2464.992	2465.856
75 (4BH)	2465.856	2466.72
76 (4CH)	2466.72	2467.584
77 (4DH)	2467.584	2468.448
78 (4EH)	2468.448	2469.312
79 (4FH)	2469.312	2470.176
80 (50H)	2470.176	2471.04
81 (51H)	2471.04	2471.904
82 (52H)	2471.904	2472.768
83 (53H)	2472.768	2473.632
84 (54H)	2473.632	2474.496
85 (55H)	2474.496	2475.36
86 (56H)	2475.36	2476.224
87 (57H)	2476.224	2477.088
88 (58H)	2477.088	2477.952
89 (59H)	2477.952	2478.816
90 (5AH)	2478.816	2479.68
91 (5BH)	2479.68	2480.544
92 (5CH)	2480.544	2481.408

13 Miscellaneous

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

Note:
This description is only applied on the model with Shield case.

13.1.1. Preparation

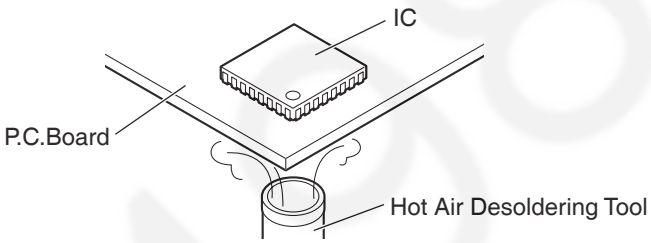
- PbF (: Pb free) Solder
- Soldering Iron
  Tip Temperature of 700 °F ± 20 °F (370 °C ± 10 °C)
  Note:
  We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.
- Hot Air Desoldering Tool
  Temperature: 608 °F ± 68 °F (320 °C ± 20 °C)

13.1.2. Caution

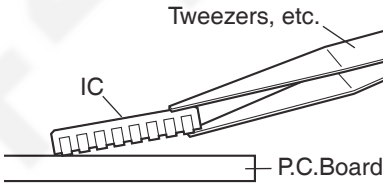
- To replace the IC efficiently, choose the right sized nozzle of the hot air desoldering tool that matches the IC package.
- Be careful about the temperature of the hot air desoldering tool not to damage the PCB and/or IC.

13.1.3. How to Remove the IC

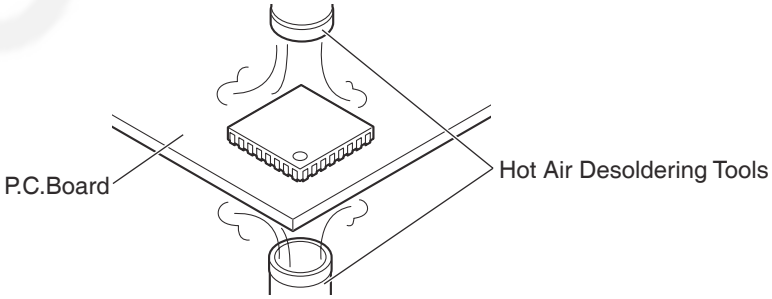
1. Heat the IC with a hot air desoldering tool through the P.C.Board.



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.



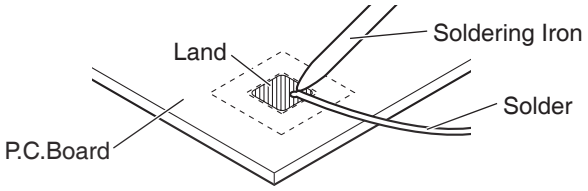
When it is hard to melt the solder completely, heat it with a hot air desoldering tool through the IC besides through the P.C.Board.



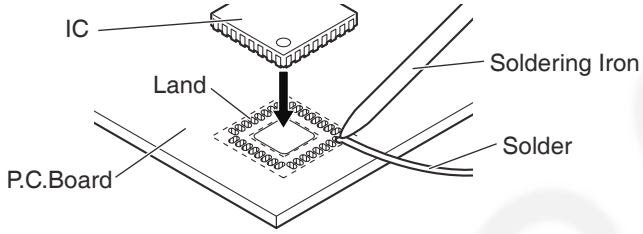
3. After removing the IC, clean the P.C.Board of residual solder.

13.1.4. How to Install the IC

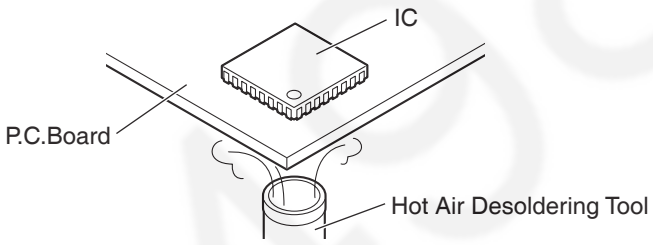
1. Place the solder a little on the land where the radiation GND pad on IC bottom is to be attached.



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

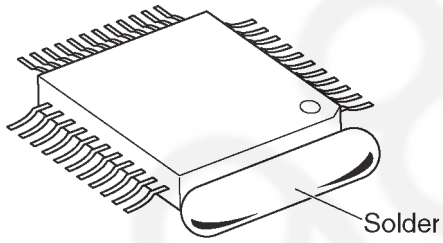
Even if you do not have the special tools (for example, a spot heater) to remove the Flat IC, with some solder (large amount), a soldering iron and a cutter knife, you can easily remove the ICs that have more than 100 pins.

13.2.1. Preparation

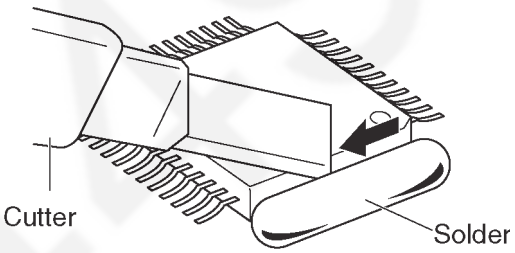
- PbF (: Pb free) Solder
- Soldering Iron
  Tip Temperature of 700 °F ± 20 °F (370 °C ± 10 °C)
  Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.
- Flux
  Recommended Flux: Specific Gravity → 0.82.
  Type → RMA (lower residue, non-cleaning type)
  Note: See **About Lead Free Solder (PbF: Pb free)** (P.4)

13.2.2. How to Remove the IC

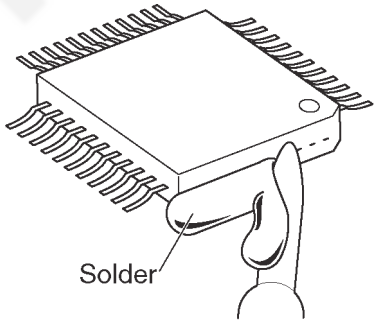
1. Put plenty of solder on the IC pins so that the pins can be completely covered.
   Note:
   If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



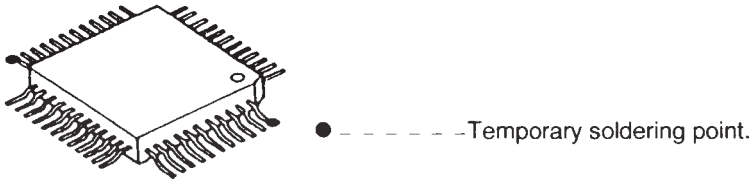
3. While the solder melts, remove it together with the IC pins.



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.

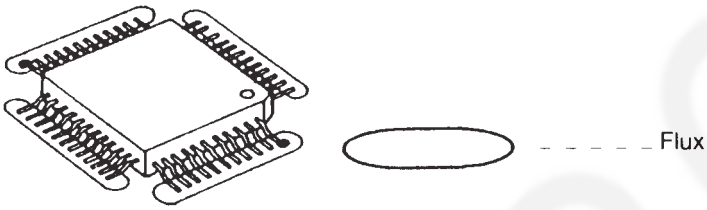
13.2.3. How to Install the IC

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

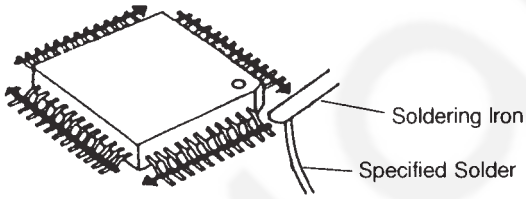


*Check the accuracy of the IC setting with the corresponding soldering foil.

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

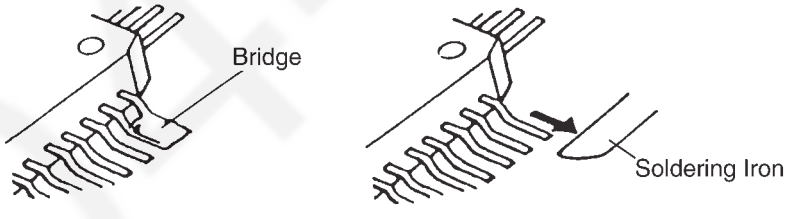


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



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. How to Replace the Shield Case

13.3.1. 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)

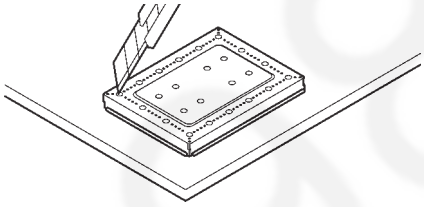
13.3.2. Caution

- 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.

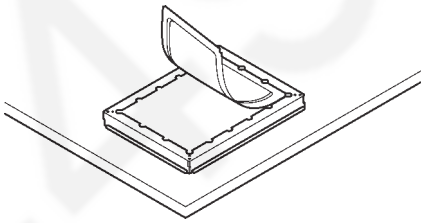
13.3.3. How to Remove the Shield Case

Note:
If you don't have special tools (ex. Hot air disordering tool), conduct the following operations.

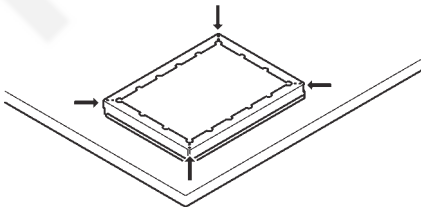
1. Cut the case along perforation.



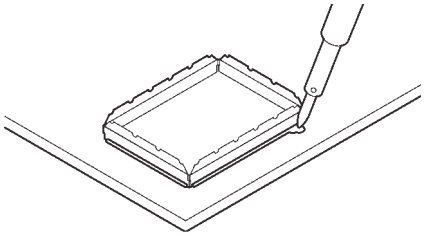
2. Remove the cut part.



3. Cut the four corners along perforation.



4. Remove the reminds by melting solder.

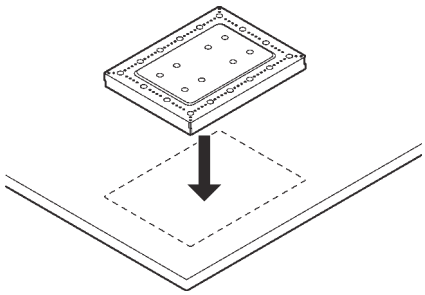


13.3.4. How to Install the Shield Case

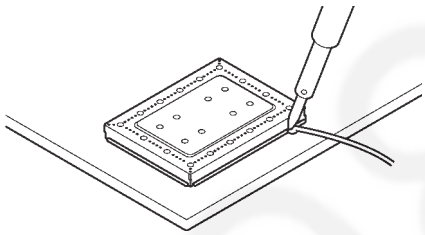
Note:

- If you don't have special tools (ex. Hot air disordering tool), conduct the following operations.
- Shield case's No. : PNMC1032Z, PNMC1033Z

1. Put the shield case.

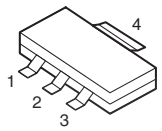
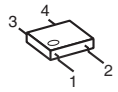
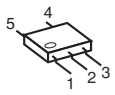
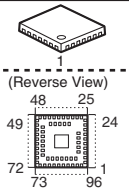
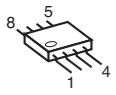
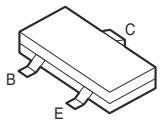
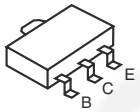
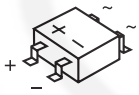
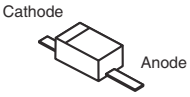
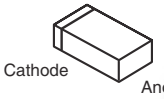
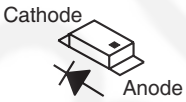


2. Solder the surroundings.

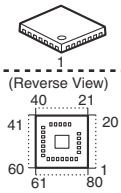
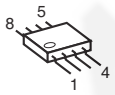
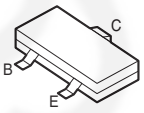
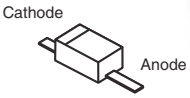
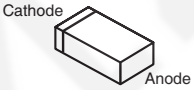
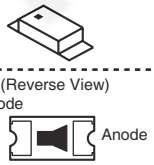
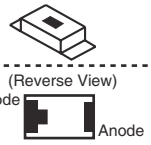


13.4. Terminal Guide of the ICs, Transistors and Diodes

13.4.1. Base Unit

 C0DBEYY00102	 C0EBE0000124	 C0CBCCC00103	 C1CB00003545	 C3FBLY000125 C3FBLY000124 PNWIG3411BXH
 B1ACGP000008	 B1ABDM000001, B1ADGE000012 B1ADNB000003, B1ABDF000017 DRC9113Z0L, B1GBCFYY0020, 2SA1576S		 DSC7003S0L	 PQVDMD5S
 1SS355	 PQVDPTZT2530	 B0ECKM000008 B0DCCD000013	 LNJ237W82RA	

13.4.2. Handset

 C1CB00003544	 PNWIGA381BXR C3FBLY000125	 B1ADGE000012, B1ADCF000040 B1ABDF000017, B1ADNB000003 2SC6054JSL	 B1ABGE000011
 B0JCMC000006 B0JCDD000001	 MA8043 B0DCCD000013	 B3ACB0000216	 B3ACB0000190

Memo

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.

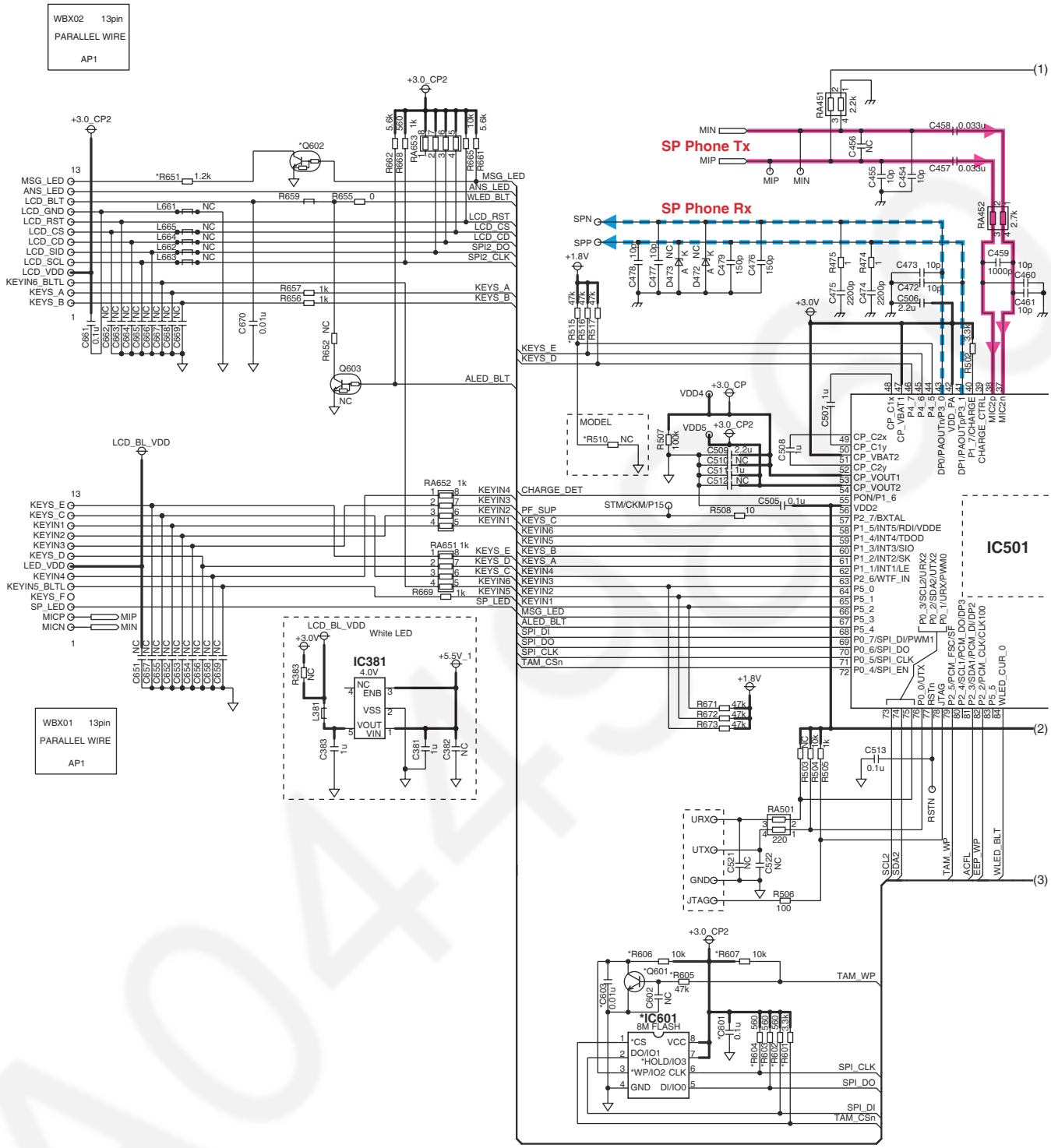
2. The schematic diagrams may be modified at any time with the development of new technology.

14.1.2. Handset (Schematic Diagram (Handset_Main))

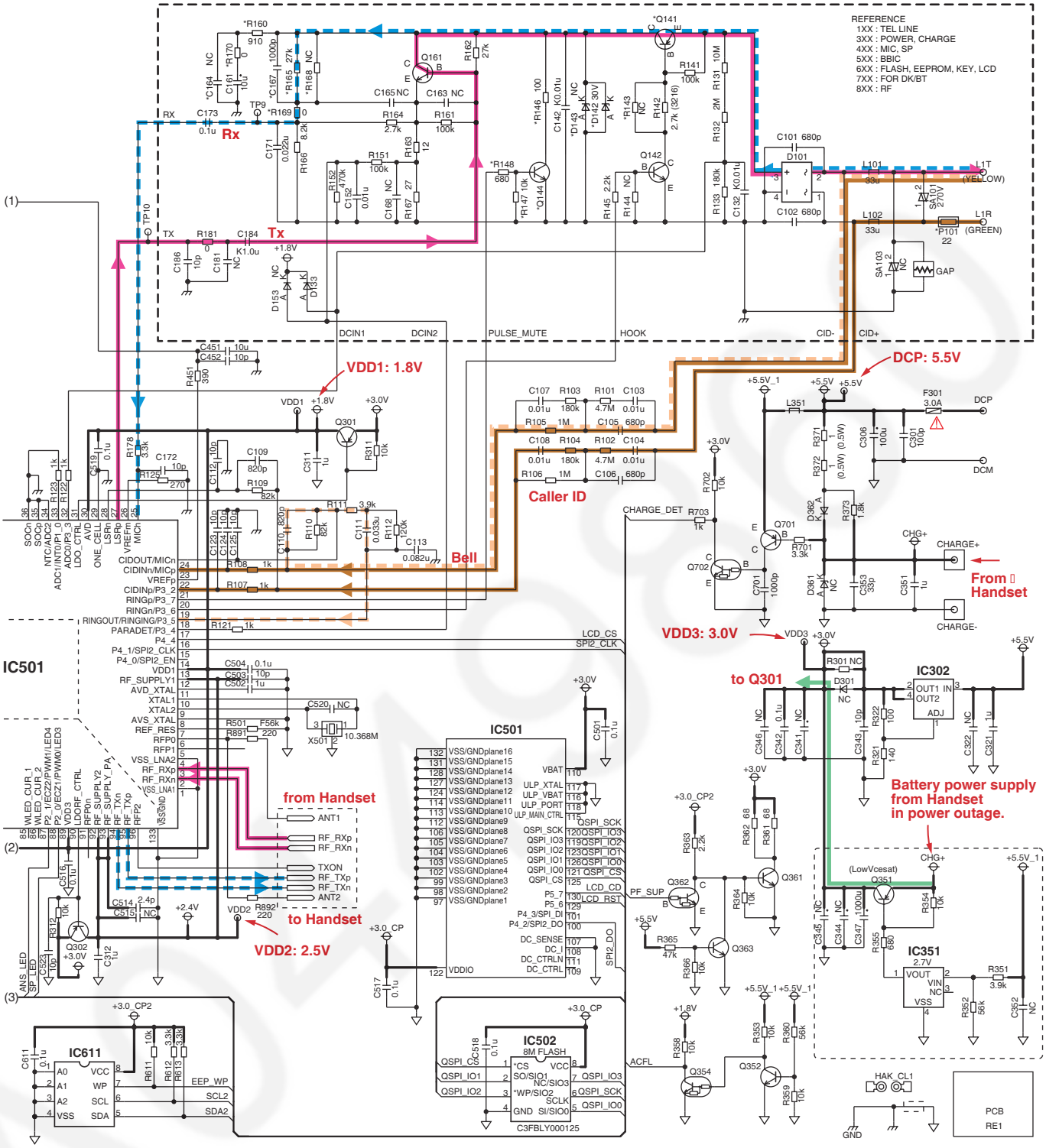
Notes:

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.

14.2. Schematic Diagram (Base Unit_Main)



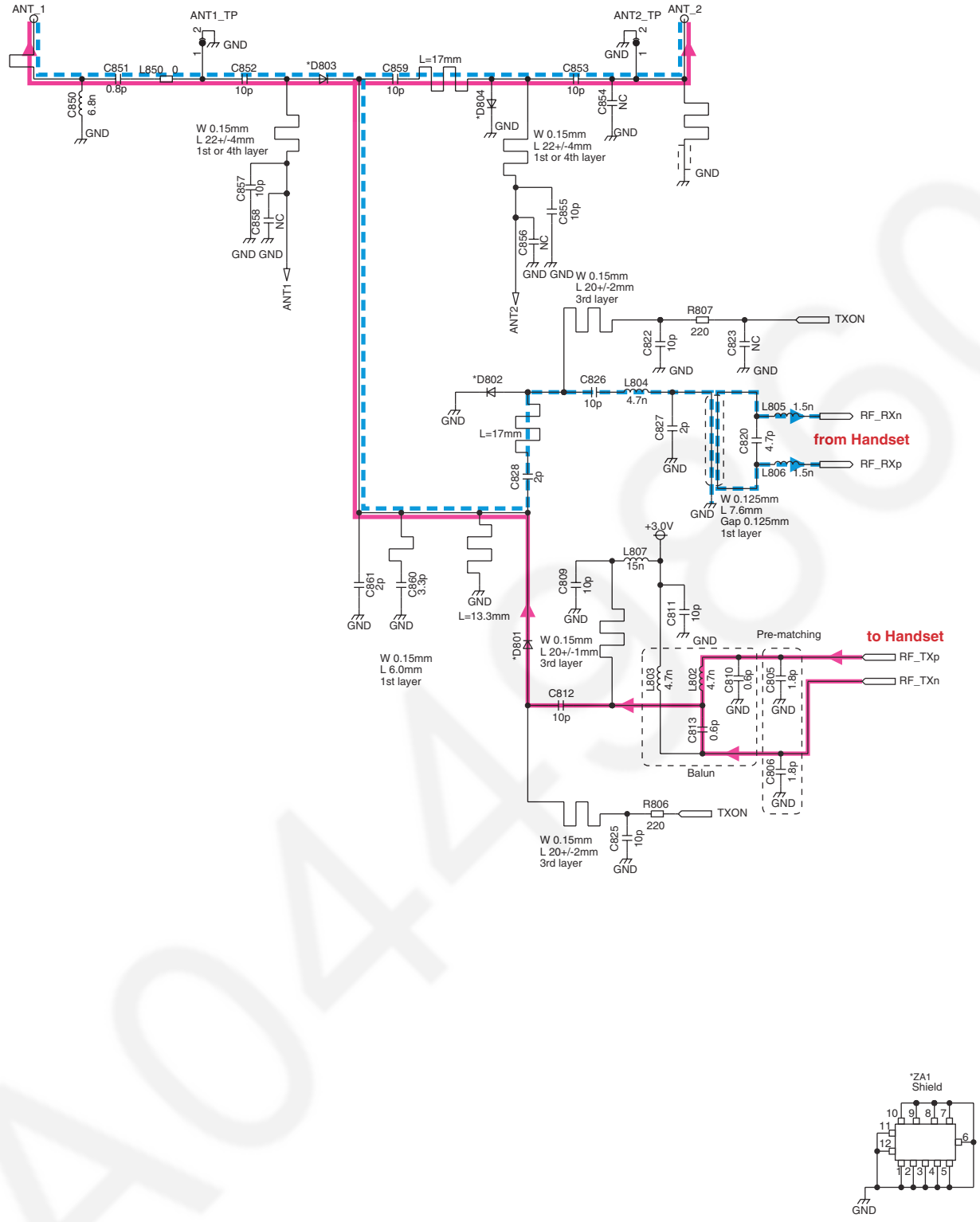
NC: No Components



NC: No Components

KX-TG3821BX SCHEMATIC DIAGRAM (Base Unit_Main)

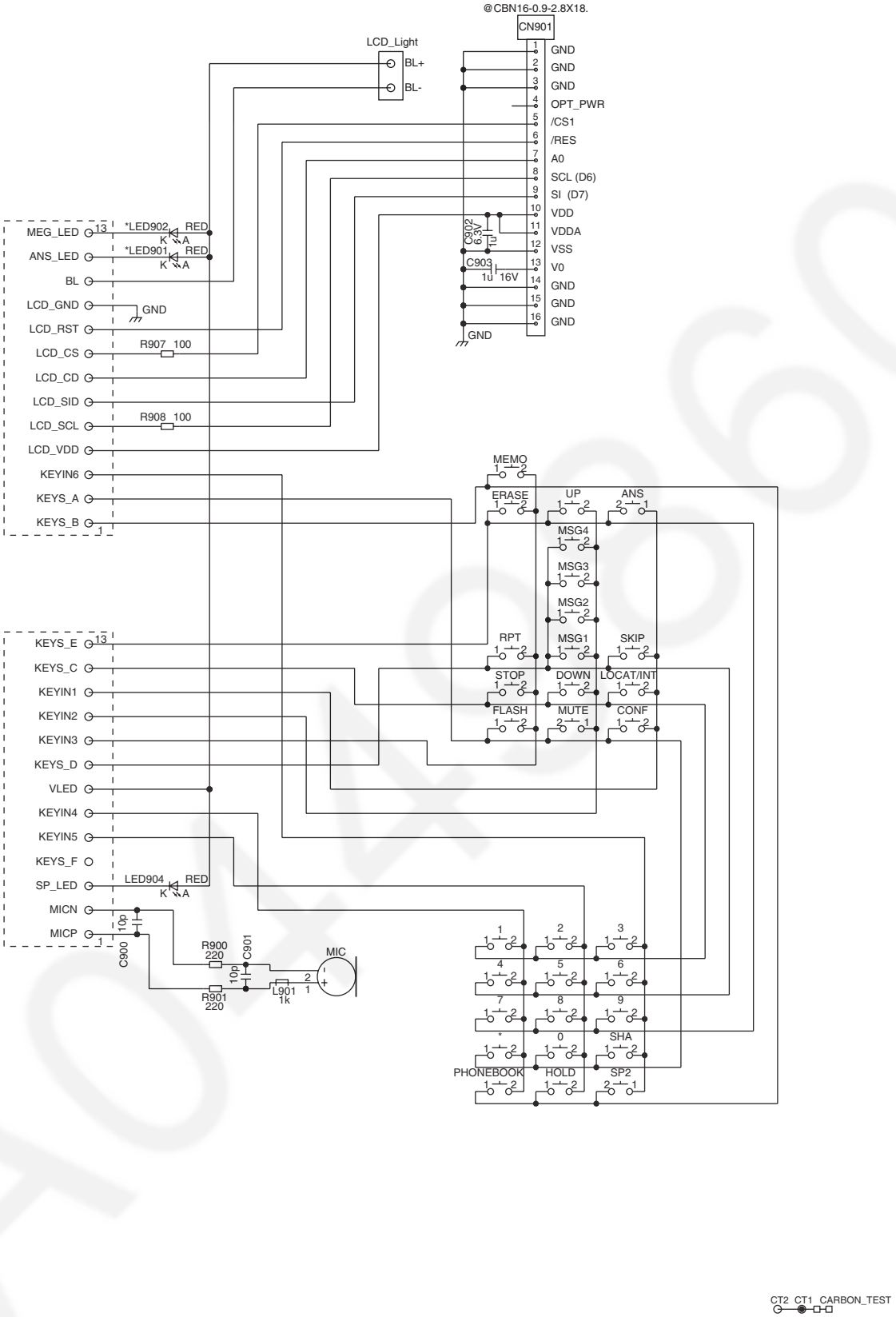
14.3. Schematic Diagram (Base Unit_RF)



NC: No Components

KX-TG3821 SCHEMATIC DIAGRAM (Base Unit_RF)

14.4. Schematic Diagram (Base Unit_Operation)



NC: No Components

KX-TG3821 SCHEMATIC DIAGRAM (Base Unit_Operation)

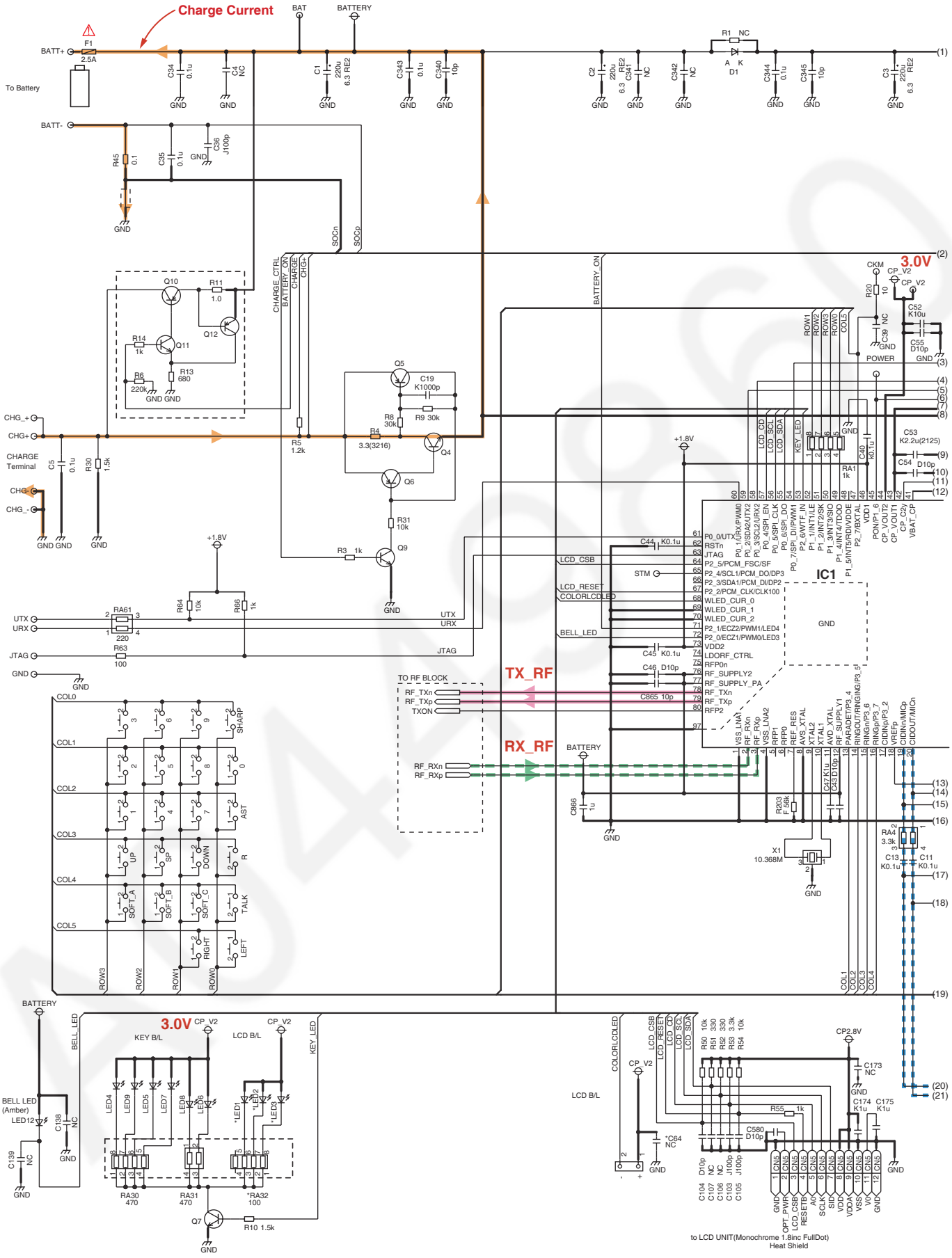
14.5. Schematic Diagram (Base Unit_LED)

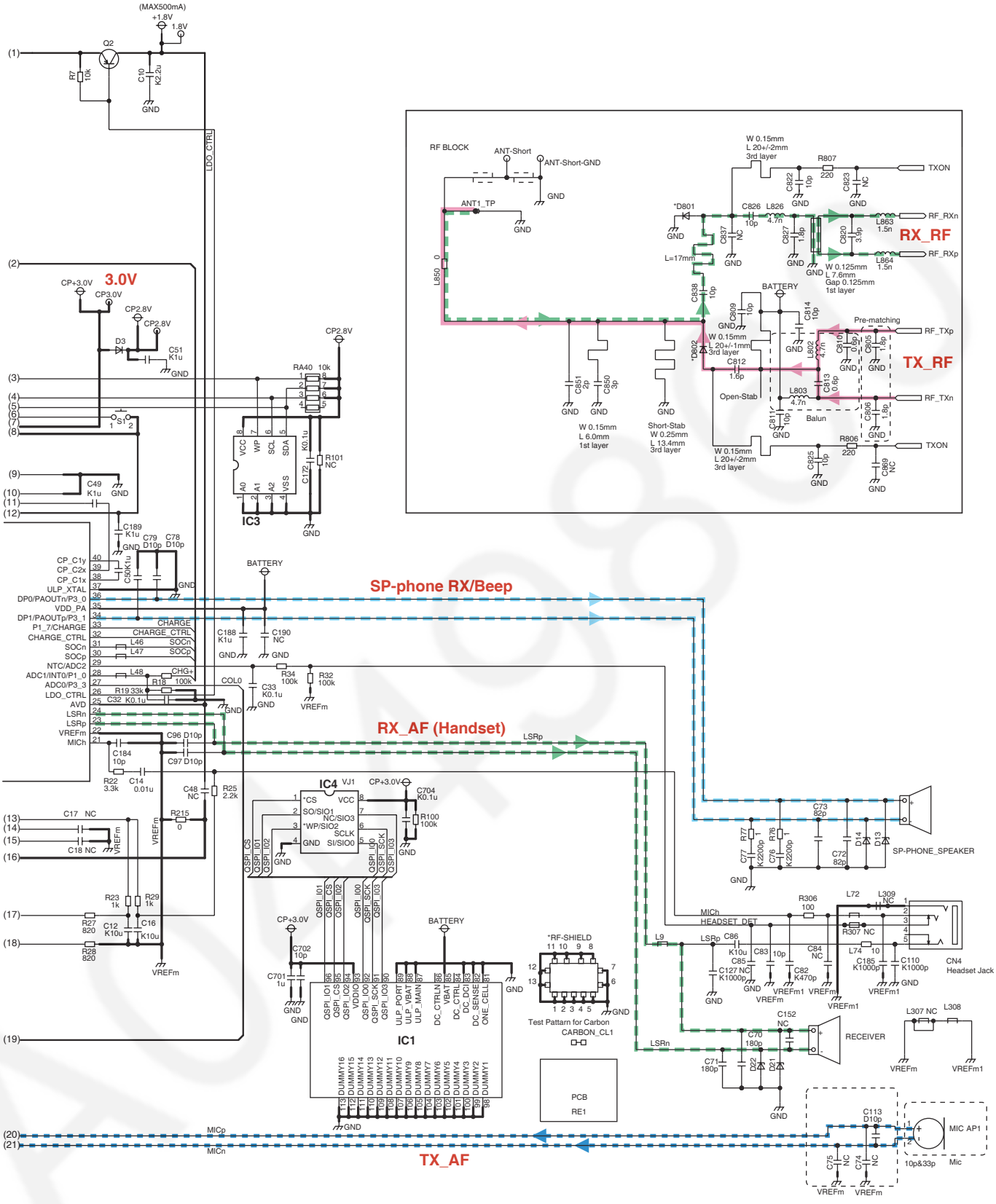
NC: No Components

KX-TG3821 SCHEMATIC DIAGRAM (Base Unit_LED)

Memo

14.6. Schematic Diagram (Handset_Main)





NC: No Components

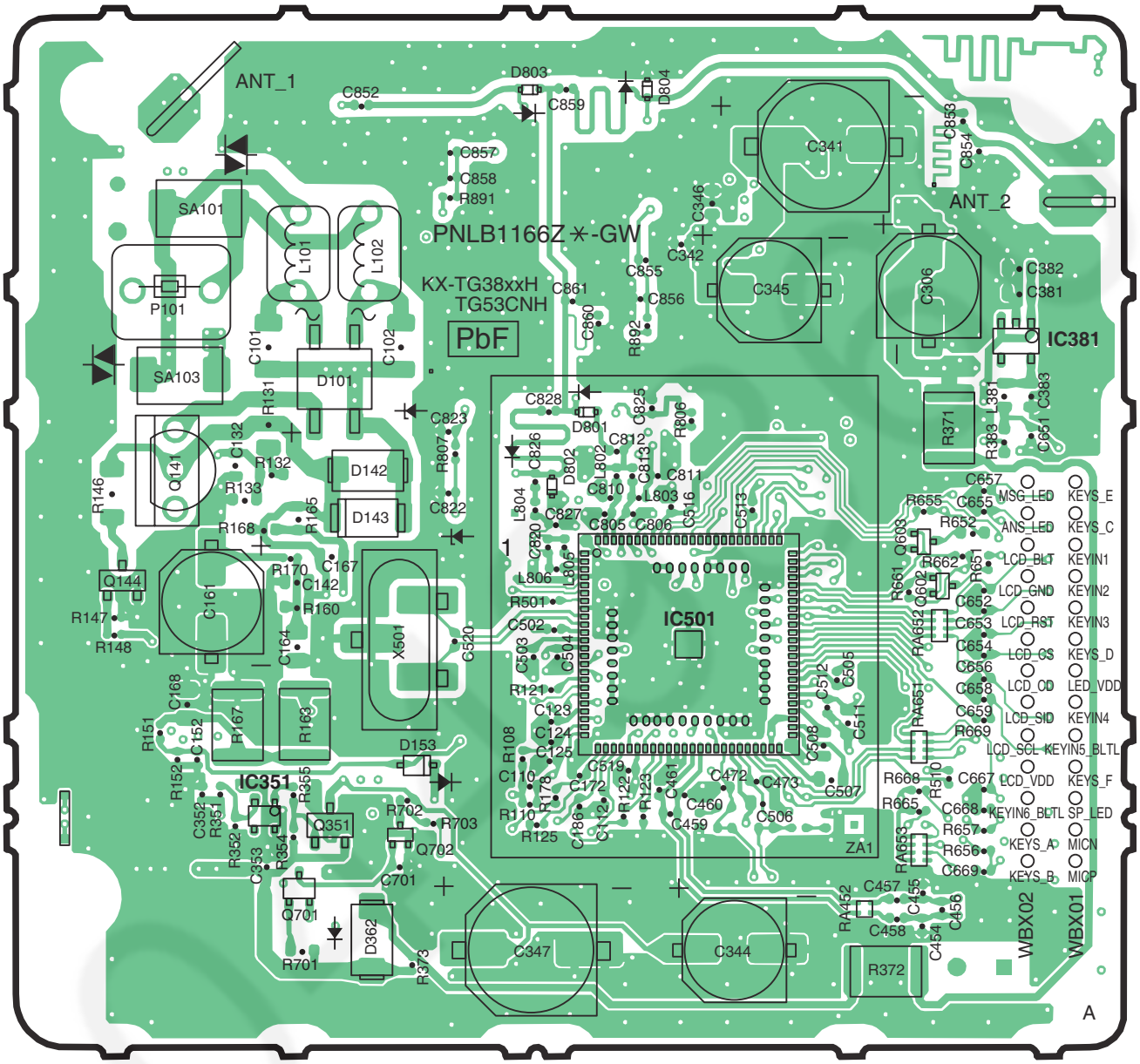
KX-TGA381 SCHEMATIC DIAGRAM (Handset_Main)

Memo

15 Printed Circuit Board

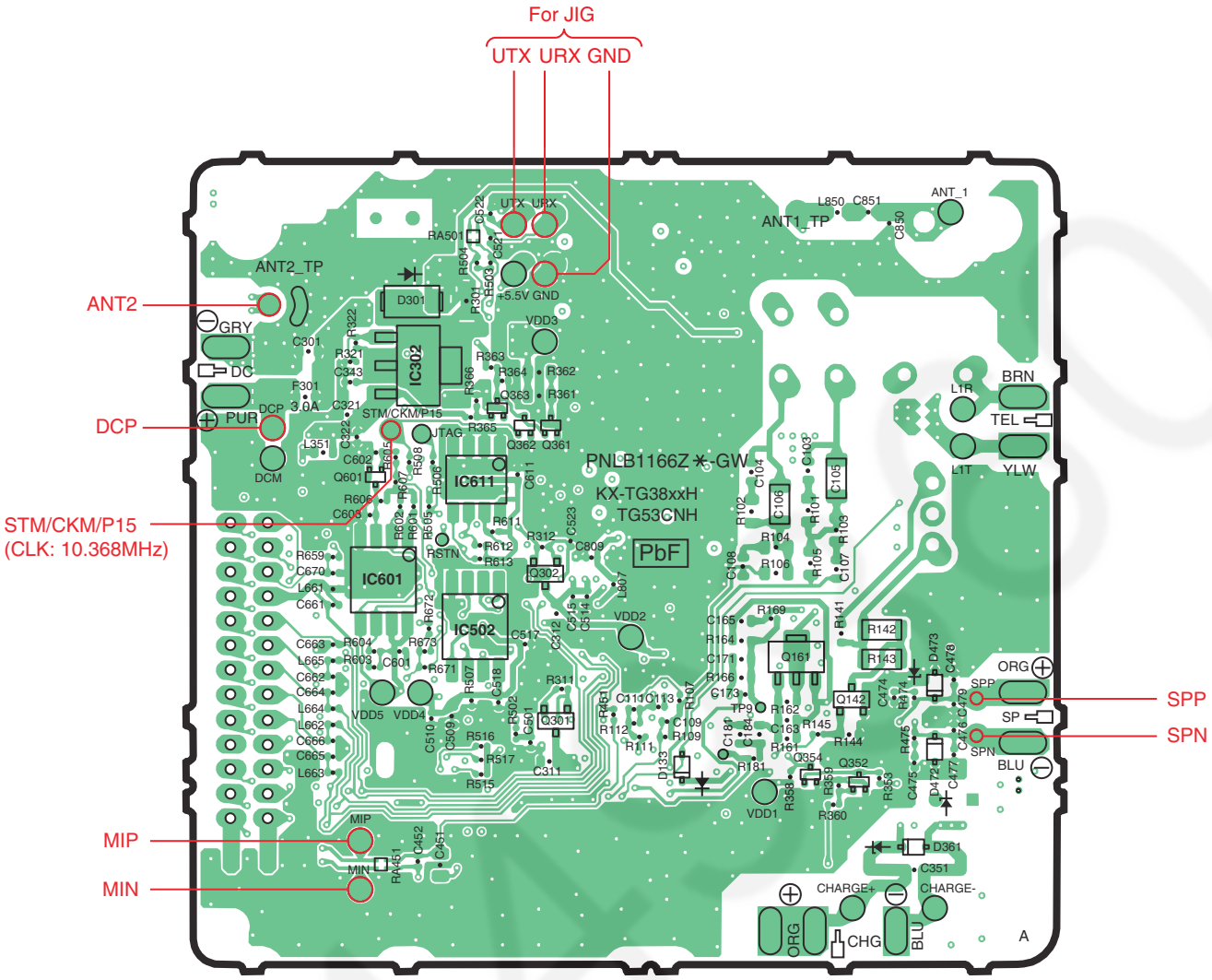
15.1. Circuit Board (Base Unit_Main)

15.1.1. Component View



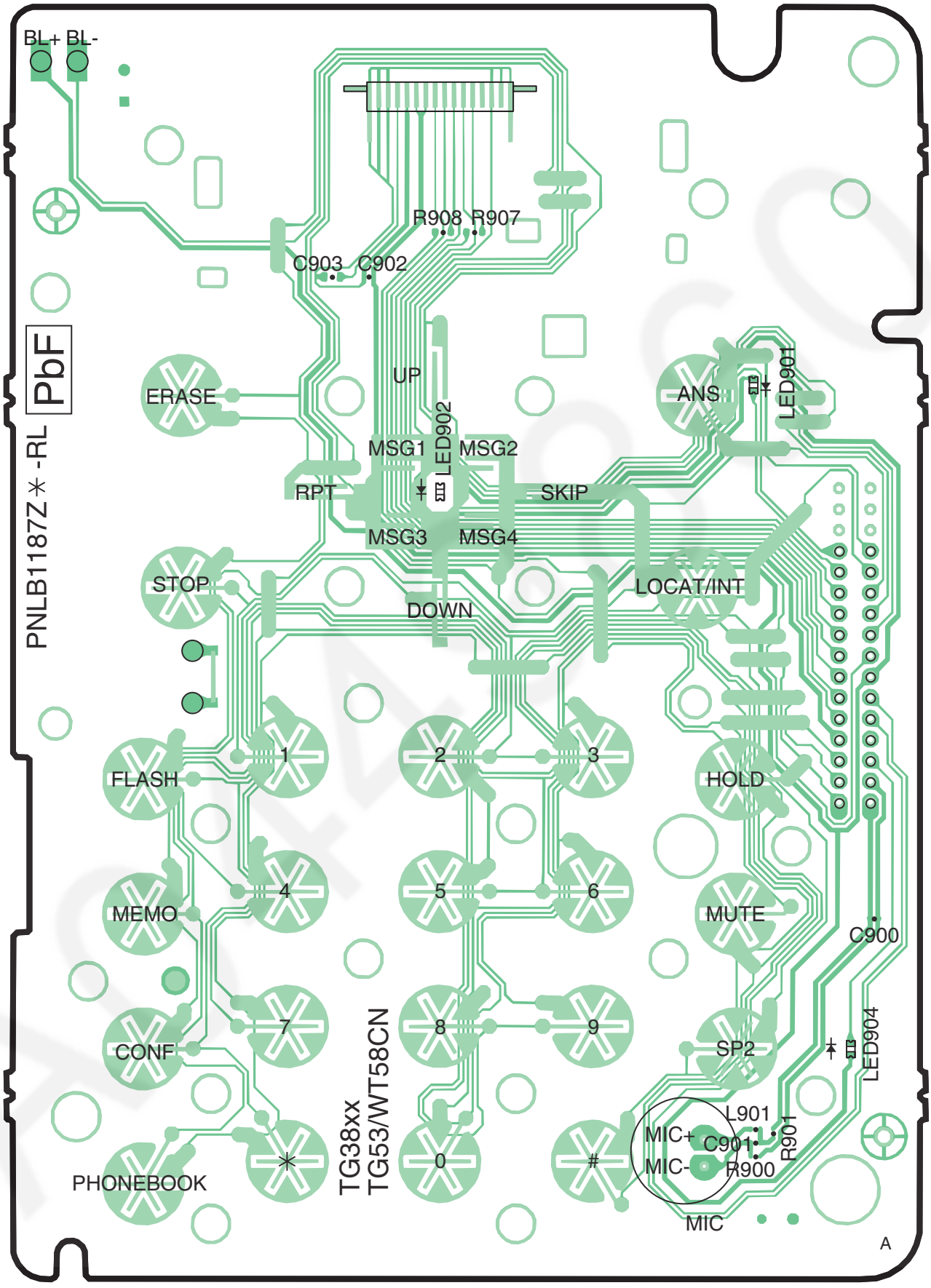
KX-TG3821 CIRCUIT BOARD (Base Unit_Main (Component View))

15.1.2. Bottom View



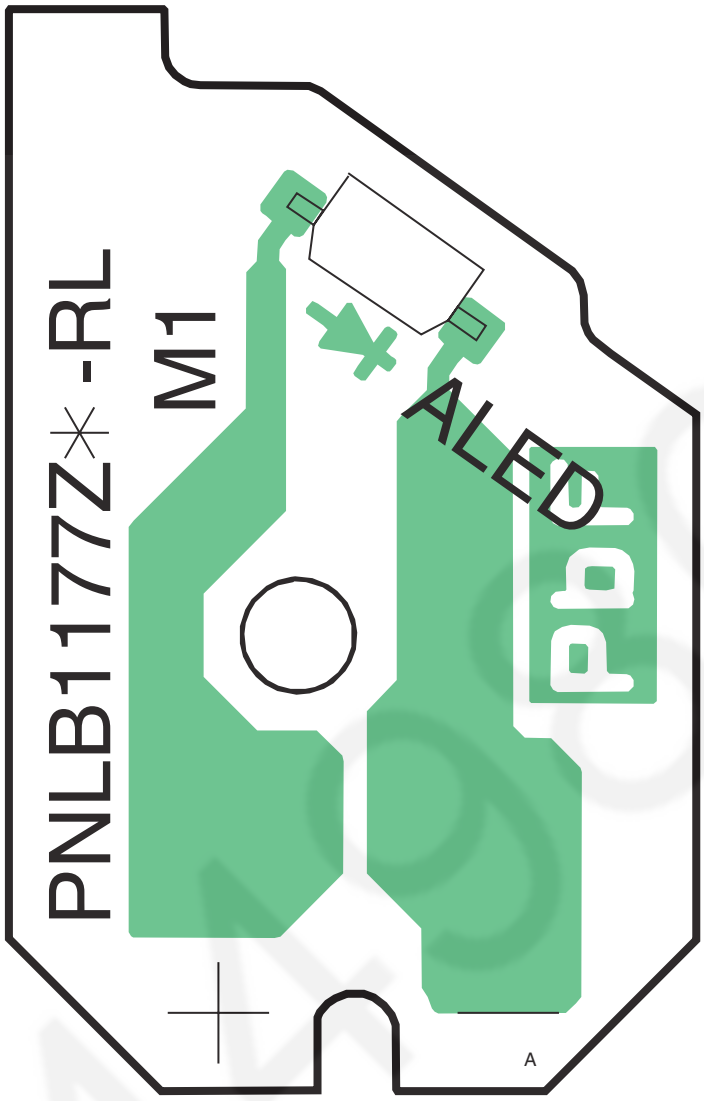
KX-TG3821 CIRCUIT BOARD (Base Unit_Main (Bottom View))

15.2. Circuit Board (Base Unit_Operation)



KX-TG3821 CIRCUIT BOARD (Base Unit_Operation (Component View))

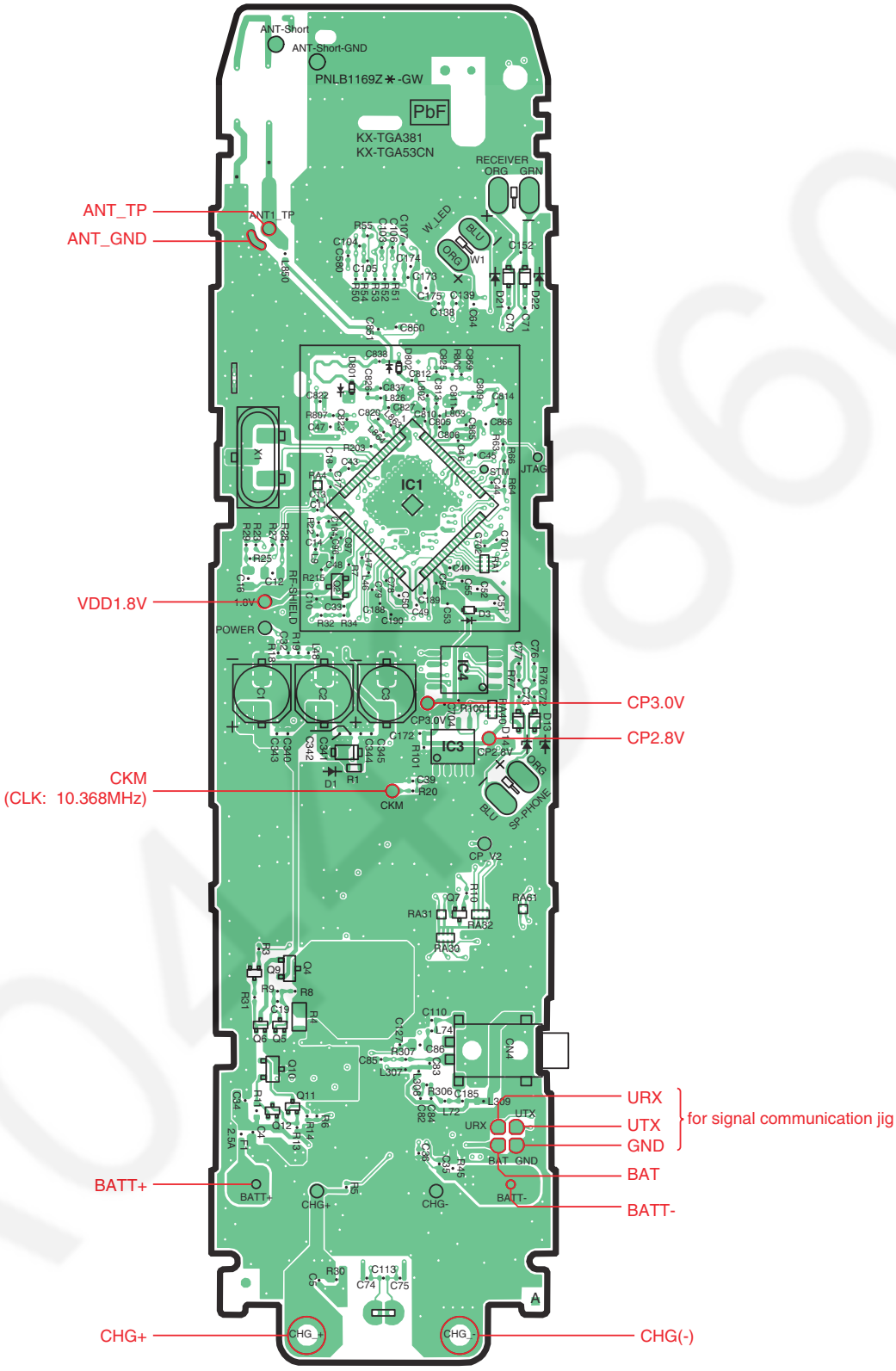
15.3. Circuit Board (Base Unit_LED)



KX-TG3821 CIRCUIT BOARD (Base Unit_LED (Component View))

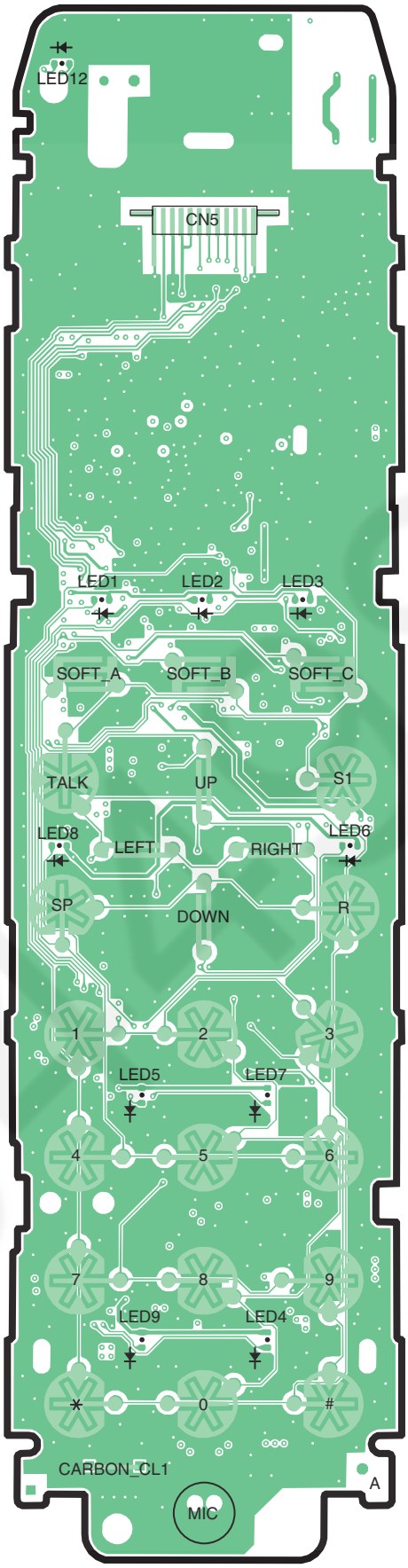
15.4. Circuit Board (Handset_Main)

15.4.1. Component View



KX-TGA381 CIRCUIT BOARD (Handset_Main (Component View))

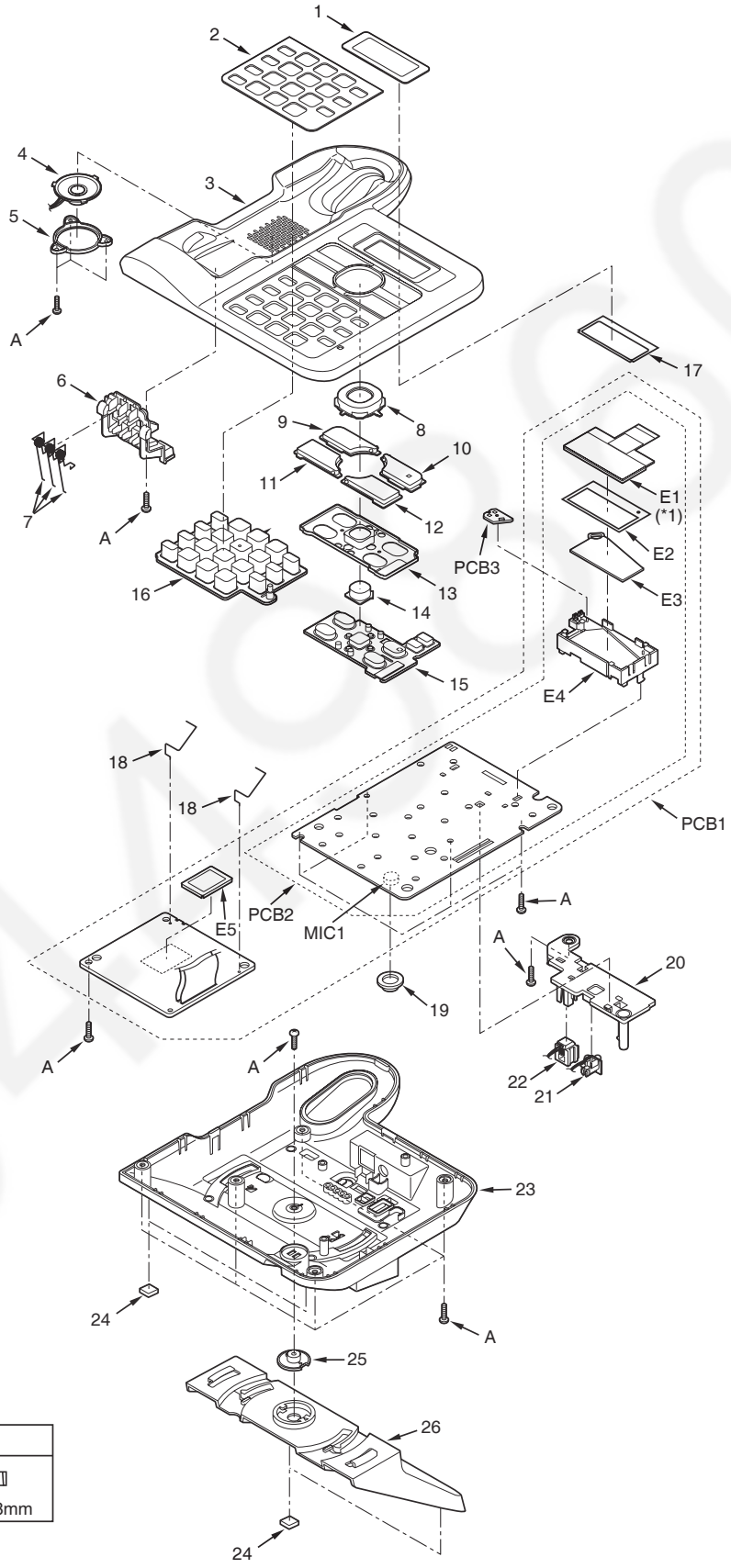
15.4.2. Bottom View



KX-TGA381 CIRCUIT BOARD (Handset_Main (Bottom View))

16 Exploded View and Replacement Parts List

16.1. Cabinet and Electrical Parts (Base Unit)

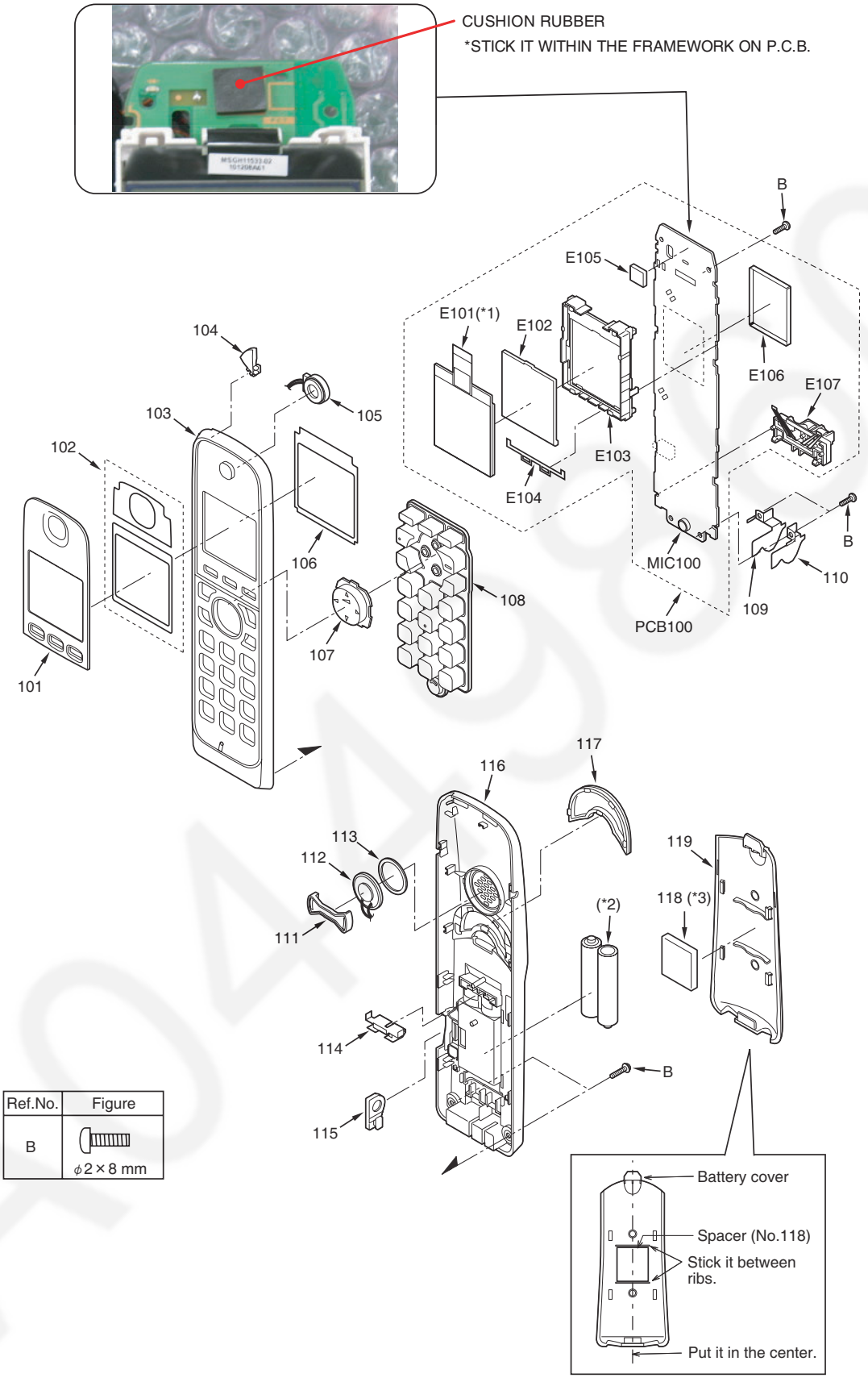


Ref.No.	Figure
A	ϕ2.6 x 8mm

Note:

(*1) This cable is fixed by welding. Refer to **How to Replace the Base unit LCD** (P.46).

16.2. Cabinet and Electrical Parts (Handset)



Ref.No.	Figure
B	ϕ2 × 8 mm

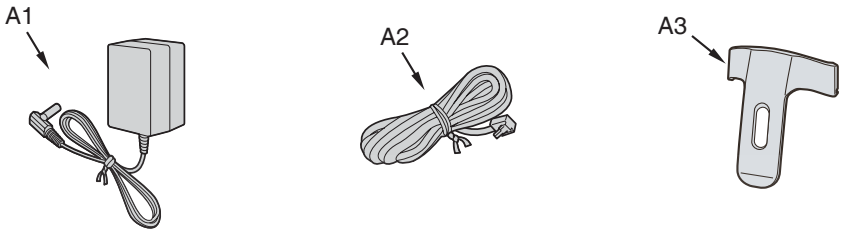
Note:

(*1) This cable is fixed by welding. Refer to **How to Replace the Handset LCD** (P.48).

(*2) The rechargeable Ni-MH battery HHR-4MRT is available through sales route of Panasonic.

(*3) Attach the SPACER (No. 118) to the exact location described above.

16.3. Accessories



16.4. 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=1000Ω, M=1000kΩ

   All capacitors are in MICRO FARADS (μF) p=μμF

   *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

16.4.1. Base Unit

16.4.1.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	1	PNGP1133Z1	PANEL, LCD	PC-HB
	2	PNGP1134X1	PANEL, UPPER	PC-HB
	3	PNKM1181S1	CABINET BODY	PS-HB
	4	L0AA04A00028	SPEAKER	
	5	PQHR11082Z	GUIDE, SPEAKER	POM-HB
	6	PNKE1089Z1	CASE, CHARGE TERMINAL	PS-HB
	7	PNJT1061Y	CHARGE TERMINAL	
	8	PNBC1346Z1	BUTTON, NAVIGATOR KEY	ABS-HB
	9	PNBC1348Z1	BUTTON, ERASE	PS-HB
	10	PNBC1347Z1	BUTTON, ANSWER ON	PS-HB
	11	PNBC1349Z1	BUTTON, STOP	PS-HB
	12	PNBC1350Z1	BUTTON, LOCATOR	PS-HB
	13	PNHR1381Z	GUIDE, BUTTON	PS-HB
	14	PNBC1345Z1	BUTTON, MESSAGE	PS-HB
	15	PNJK1101Z	KEYBOARD SWITCH, TAM	
	16	PNJK1100X	KEYBOARD SWITCH, DIAL	
	17	PNYE1038Z	SPACER, CUSHION LCD	
	18	PNLA1047Z	ANTENNA, SUB	
	19	PQMG10025W	RUBBER PARTS, MIC	
	20	PNHR1383Z	GUIDE, JACK	PS-HB
	21	K2ECYZ000001	JACK, DC	
	22	PQJJ1T039M	JACK, MODULAR	
	23	PNKF1131Z1	CABINET COVER	PS-HB
	24	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	
	25	PNHR1249Z	PLASTIC PARTS	POM-HB
	26	PNKL1027Y1	STAND, WALL MOUNT	PS-HB

16.4.1.2. Main P.C. Board Parts

Note:

(*1) When replacing IC502, IC601, IC611 or X501, make the adjustment using PNZZTG3821BX. Refer to **How to download the data** (P.57) of Things to Do after Replacing IC or X'tal.

(*2) When replacing the base unit LCD, See **How to Replace the Base unit LCD** (P.46).

(*3) When removing E5, use special tools (ex. Hot air disordering tool).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB1	PNWP13821BXH	MAIN P.C.BOARD ASS'Y (RTL)	
			(ICs)	
	IC302	C0DBEYY00102	IC	
	IC351	C0EBE0000124	IC	
	IC381	C0CBCCC00103	IC	
	IC501	C1CB00003545	IC	
	IC502	C3FBLY000125	IC(FLASH) (*1)	
	IC601	C3FBLY000124	IC(FLASH) (*1)	
	IC611	PNWIG3411BXH	IC(EEPROM)(*1)	
			(TRANSISTORS)	
	Q141	B1ACGP000008	TRANSISTOR(SI)	
	Q142	B1ABDM000001	TRANSISTOR(SI)	
	Q161	DSC7003S0L	TRANSISTOR(SI)	
	Q301	B1ADGE000012	TRANSISTOR(SI)	
	Q302	B1ADGE000012	TRANSISTOR(SI)	
	Q351	B1ADNB000003	TRANSISTOR(SI)	
	Q352	B1ABDF000017	TRANSISTOR(SI)	
	Q354	DRC9113Z0L	TRANSISTOR(SI)	
	Q361	B1ABDF000017	TRANSISTOR(SI)	
	Q362	B1GBCFYY0020	TRANSISTOR(SI)	
	Q363	B1ABDF000017	TRANSISTOR(SI)	
	Q601	B1ABDF000017	TRANSISTOR(SI)	
	Q602	DRC9113Z0L	TRANSISTOR(SI)	
	Q701	2SA1576S	TRANSISTOR(SI)	S
	Q702	B1GBCFYY0020	TRANSISTOR(SI)	
			(DIODES)	
	D101	PQVDMD5S	DIODE(SI)	
	D133	1SS355	DIODE(SI)	S
	D142	PQVDPTZT2530	DIODE(SI)	S
	D362	B0ECKM000008	DIODE(SI)	
	D801	B0DCCD000013	DIODE(SI)	
	D802	B0DCCD000013	DIODE(SI)	
	D803	B0DCCD000013	DIODE(SI)	
	D804	B0DCCD000013	DIODE(SI)	
			(COILS)	
	L101	PQLQXF330K	COIL	S
	L102	PQLQXF330K	COIL	S
	L351	PQLQR2KA113	COIL	S
	L381	PQLQR2KA113	COIL	S
	L802	G1C4N7Z00006	COIL	
	L803	G1C4N7Z00006	COIL	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	L804	G1C4N7Z00006	COIL	
	L805	G1C1N5Z00007	COIL	
	L806	G1C1N5Z00007	COIL	
	L807	PQLQR4C15NJ	COIL	S
	C850	PQLQR4C6N8J	COIL	S
			(RESISTOR ARRAYS)	
	RA451	D1H422220001	RESISTOR ARRAY	
	RA452	D1H427220001	RESISTOR ARRAY	
	RA501	D1H422120001	RESISTOR ARRAY	
	RA651	D1H810240004	RESISTOR ARRAY	S
	RA652	D1H810240004	RESISTOR ARRAY	S
	RA653	D1H810240004	RESISTOR ARRAY	S
			(VARISTOR)	
	SA101	J0LF00000048	VARISTOR (SURGE ABSORBER)	
			(RESISTORS)	
	R101	PQ4R10XJ475	4.7M	S
	R102	PQ4R10XJ475	4.7M	S
	R103	PQ4R10XJ184	180k	S
	R104	PQ4R10XJ184	180k	S
	R105	PQ4R10XJ105	1M	S
	R106	PQ4R10XJ105	1M	S
	R107	ERJ2GEJ102	1k	S
	R108	ERJ2GEJ102	1k	S
	R109	ERJ2GEJ823	82k	S
	R110	ERJ2GEJ823	82k	S
	R111	ERJ2GEJ392	3.9k	S
	R112	ERJ2GEJ124	120k	S
	R121	ERJ2GEJ102	1k	S
	R122	ERJ2GEJ102	1k	S
	R123	ERJ2GEJ102	1k	S
	R125	ERJ2GEJ271	270	S
	R131	PQ4R18XJ106	10M	S
	R132	ERJ3GEYJ205	2M	S
	R133	ERJ3GEYJ184	180k	S
	R141	ERJ3GEYJ104	100k	S
	R142	PQ4R18XJ272	2.7k	S
	R145	ERJ2GEJ222	2.2k	S
	R151	ERJ2GEJ104	100k	S
	R152	ERJ2GEJ474X	470k	S
	R160	ERJ3GEYJ911	910	S
	R161	ERJ3GEYJ104	100k	S
	R162	ERJ3GEYJ273	27k	S
	R163	ERJ12YJ120	12	
	R164	ERJ3GEYJ272	2.7k	S
	R165	ERJ3GEYJ273	27k	S
	R166	ERJ3GEYJ822	8.2k	S
	R167	ERJ12YJ270	27	
	R169	ERJ2GE0R00	0	S
	R170	ERJ2GE0R00	0	S
	R178	ERJ2GEJ332	3.3k	S
	R181	ERJ2GE0R00	0	S
	R311	ERJ2GEJ103	10k	S
	R312	ERJ2GEJ103	10k	S
	R321	ERJ2RKF1400	140	
	R322	ERJ2RKF1000	100	
	R351	ERJ2GEJ392	3.9k	S
	R352	ERJ2GEJ563	56k	S
	R353	ERJ2GEJ103	10k	S
	R354	ERJ2GEJ103	10k	S
	R355	ERJ2GEJ681	680	S
	R358	ERJ2GEJ103	10k	S
	R359	ERJ2GEJ103	10k	S
	R360	ERJ2GEJ563	56k	S
	R361	PQ4R10XJ680	68	S
	R362	PQ4R10XJ680	68	S
	R363	ERJ2GEJ222	2.2k	S
	R364	ERJ2GEJ103	10k	S
	R365	ERJ2GEJ473	47k	S
	R366	ERJ2GEJ103	10k	S
	R371	ERJ12YJ1R0	1	
	R372	ERJ12YJ1R0	1	
	R373	ERJ2GEJ182	1.8k	S

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R451	ERJ2GEJ391	390	S
	R474	ERJ2GEJ1R0	1	S
	R475	ERJ2GEJ1R0	1	S
	R501	D0GA563ZA006	56k	
	R502	ERJ2GEJ332	3.3k	S
	R504	ERJ2GEJ103	10k	S
	R505	ERJ2GEJ102	1k	S
	R506	ERJ2GEJ101	100	S
	R507	ERJ2GEJ104	100k	S
	R508	ERJ2GEJ100	10	S
	R515	ERJ2GEJ473	47k	S
	R516	ERJ2GEJ473	47k	S
	R517	ERJ2GEJ473	47k	S
	R601	ERJ2GEJ332	3.3k	S
	R602	ERJ2GEJ561	560	S
	R603	ERJ2GEJ561	560	S
	R604	ERJ2GEJ561	560	S
	R605	ERJ2GEJ473	47k	S
	R606	ERJ2GEJ103	10k	S
	R607	ERJ2GEJ103	10k	S
	R611	ERJ2GEJ103	10k	S
	R612	ERJ2GEJ332	3.3k	S
	R613	ERJ2GEJ332	3.3k	S
	R651	ERJ2GEJ122	1.2k	S
	R655	ERJ2GE0R00	0	S
	R656	ERJ2GEJ102	1k	S
	R657	ERJ2GEJ102	1k	S
	R661	ERJ2GEJ562X	5.6k	S
	R662	ERJ2GEJ562X	5.6k	S
	R665	ERJ2GEJ103	10k	S
	R668	ERJ2GEJ561	560	S
	R669	ERJ2GEJ102	1k	S
	R671	ERJ2GEJ473	47k	S
	R672	ERJ2GEJ473	47k	S
	R673	ERJ2GEJ473	47k	S
	R701	ERJ3GEYJ332	3.3k	S
	R702	ERJ2GEJ103	10k	S
	R703	ERJ2GEJ102	1k	S
	R806	ERJ2GEJ221	220	S
	R807	ERJ2GEJ221	220	S
	R891	ERJ2GEJ221	220	S
	R892	ERJ2GEJ221	220	S
	L850	ERJ3GEY0R00	0	S
			(CAPACITORS)	
	C101	ECUV2H681KB	680p	S
	C102	ECUV2H681KB	680p	S
	C103	ECUV1C103KBV	0.01	
	C104	ECUV1C103KBV	0.01	
	C105	ECUV2H681KB	680p	S
	C106	ECUV2H681KB	680p	S
	C107	ECUV1C103KBV	0.01	
	C108	ECUV1C103KBV	0.01	
	C109	ECUE1H821KBQ	820p	
	C110	ECUE1H821KBQ	820p	
	C111	ECUE1A333KBQ	0.033	
	C112	ECUE1H100DCQ	10p	
	C113	ECUE1A823KBQ	0.082	
	C123	ECUE1H100DCQ	10p	
	C124	ECUE1H100DCQ	10p	
	C125	ECUE1H100DCQ	10p	
	C132	ECUV1C105KBV	1	
	C142	ECUV1H103KBV	0.01	
	C152	ECUE1C103KBQ	0.01	
	C161	EEE1HA100SP	10	
	C167	ECUV1H102KBV	0.001	
	C171	ECUV1C223KBV	0.022	
	C172	ECUE1H100DCQ	10p	
	C173	ECUE1A104KBQ	0.1	
	C184	ECUV1A105KBV	1	
	C186	ECUE1H100DCQ	10p	
	C301	ECUV1H101JCV	100p	
	C306	F2G1C1010034	100	
	C311	ECUV1C105KBV	1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C312	ECUV1C105KBV	1	
	C321	ECUV1A105KBV	1	
	C342	ECUE1A104KBQ	0.1	
	C343	ECUE1H100DCQ	10p	
	C347	F2G0J1020022	1000	
	C351	ECUV1C105KBV	1	
	C353	ECUE1H330JCQ	33p	
	C381	ECUV1C105KBV	1	
	C383	ECUV1C105KBV	1	
	C451	PQCUV0J106KB	10	
	C452	ECUE1H100DCQ	10p	
	C454	ECUE1H100DCQ	10p	
	C455	ECUE1H100DCQ	10p	
	C457	ECUE1C333KBQ	0.033	
	C458	ECUE1C333KBQ	0.033	
	C459	ECUE1H102KBQ	0.001	
	C460	ECUE1H100DCQ	10p	
	C461	ECUE1H100DCQ	10p	
	C472	ECUE1H100DCQ	10p	
	C473	ECUE1H100DCQ	10p	
	C474	ECUE1H222KBQ	0.0022	
	C475	ECUE1H222KBQ	0.0022	
	C476	ECUE1H151JCQ	150p	
	C477	ECUE1H100DCQ	10p	
	C478	ECUE1H100DCQ	10p	
	C479	ECUE1H151JCQ	150p	
	C501	ECUE1A104KBQ	0.1	
	C502	ECUE0J105KBQ	1	
	C503	ECUE1H100DCQ	10p	
	C504	ECUE1A104KBQ	0.1	
	C505	ECUE1A104KBQ	0.1	
	C506	ECUV1A225KBV	2.2	
	C507	ECUV1A105KBV	1	
	C508	ECUV1A105KBV	1	
	C509	ECUV0J225KBV	2.2	
	C511	ECUV1A105KBV	1	
	C513	ECUE1A104KBQ	0.1	
	C514	F1G1H2R4A798	2.4p	
	C516	ECUE1A104KBQ	0.1	
	C517	ECUE1A104KBQ	0.1	
	C518	ECUE1A104KBQ	0.1	
	C519	ECUE1A104KBQ	0.1	
	C523	F1G1H100A722	10p	
	C601	ECUE1A104KBQ	0.1	
	C603	ECUE1C103KBQ	0.01	
	C611	ECUE1A104KBQ	0.1	
	C661	ECUE1A104KBQ	0.1	
	C670	ECUE1C103KBQ	0.01	
	C701	ECUE1H102KBQ	0.001	
	C805	F1G1H1R8A798	1.8p	
	C806	F1G1H1R8A798	1.8p	
	C809	ECUE1H100DCQ	10p	S
	C810	F1G1HR60A798	0.6p	
	C811	ECUE1H100DCQ	10p	S
	C812	ECUE1H100DCQ	10p	S
	C813	F1G1HR60A798	0.6p	
	C820	F1G1H4R7A798	4.7p	
	C822	ECUE1H100DCQ	10p	S
	C825	ECUE1H100DCQ	10p	S
	C826	F1G1H100A722	10p	
	C827	F1G1H2R0A798	2p	
	C828	F1G1H2R0A798	2p	
	C851	F1G1HR80A798	0.8p	
	C852	ECUE1H100DCQ	10p	S
	C853	ECUE1H100DCQ	10p	S
	C855	ECUE1H100DCQ	10p	S
	C857	ECUE1H100DCQ	10p	S
	C859	ECUE1H100DCQ	10p	S
	C860	F1G1H3R3A798	3.3p	
	C861	F1G1H2R0A798	2p	
			(OTHERS)	
	E1	L5DYBYY00020	LIQUID CRYSTAL DISPLAY (*2)	
	E2	PNHX1379Z	COVER, LCD	
	E3	PNHR1384Z	TRANSPARENT PLATE, LCD	PMMA-HB
	E4	PNHR1382Z	GUIDE, LCD	ABS-HB
	E5	PNMC1033Z	CASE, MAGNETIC SHIELD (*3)	
	P101	D4DAY220A022	THERMISTOR (POSISTOR)	
	R659	J0JCC0000286	IC FILTER	
⚠	F301	K5H302Y00003	FUSE	
	X501	H0J103500037	CRYSTALOSCILLATOR (*1)	

16.4.1.3. Operational P.C.Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB2	PNWP23821BXH	OPERATIONAL P.C.BOARD ASS'Y (RTL)	
			(LEDS)	
	LED901	LNJ237W82RA	LED	
	LED902	LNJ237W82RA	LED	
	LED904	LNJ237W82RA	LED	
			(RESISTORS)	
	R900	ERJ2GEJ221	220	S
	R901	ERJ2GEJ221	220	S
	R907	ERJ3GEYJ101	100	S
	R908	ERJ3GEYJ101	100	S
			(CAPACITORS)	
	C900	ECUE1H100DCQ	10p	
	C901	ECUE1H100DCQ	10p	
	C902	ECUE0J105KBQ	1	
	C903	ECUV1C105KBV	1	
			(OTHERS)	
	L901	J0JCC0000286	IC FILTER	
	MIC1	L0CBAY000018	MICROPHONE	

16.4.1.4. LED Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB3	PNWP33821BXH	LED P.C.BOARD ASS'Y (RTL)	
			(LED)	
	ALED	B3ACB0000254	LED	

16.4.2. Handset

16.4.2.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	101	PNGP1136Z1	PANEL, LCD	PMMA-HB
	102	PNYE1041Z	TAPE, DOUBLE SIDED	
	103	PNKM1184Z1	CABINET BODY	ABS-HB
	104	PNHR1390Z	OPTIC CONDUCTIVE PARTS, LED LENS	PS-HB
	105	L0AD01A00024	RECEIVER	
	106	PNYE1040Z	SPACER, CUSHION LCD	
	107	PNBC1354Z1	BUTTON, NAVIGATOR KEY	ABS-HB
	108	PNJK1104V	KEYBOARD SWITCH	
	109	PNJT1057Y	CHARGE TERMINAL (L)	
	110	PNJT1058Y	CHARGE TERMINAL (R)	
	111	PQHR11315Z	GUIDE, SPEAKER	ABS-HB
	112	L0AA02A00095	SPEAKER	
	113	PQHS10784Y	SPACER, SPEAKER NET	
	114	PQJC10056W	BATTERY TERMINAL	
	115	PNKE1091Z1	COVER, EP CAP	
	116	PNKF1133Z1	CABINET COVER	ABS-HB
	117	PNKE1092Z1	COVER, RUBBER GRIP	
	118	PNHS1079Z	SPACER, BATTERY	
	119	PNKK1052Z1	LID, BATTERY	ABS-HB

16.4.2.2. Main P.C. Board Parts

Note:

(*1) When replacing IC4, IC3 or X1, make the adjustment using PNZZTG3821BX. Refer to **Handset** (P.58) of Things to Do after Replacing IC or X'tal.

(*2) When replacing the handset LCD, See **How to Replace the Handset LCD** (P.48).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB100	PNWPGA381BXR	MAIN P.C.BOARD ASS'Y (RTL)	
			(ICs)	
	IC1	C1CB00003544	IC	
	IC3	PNWIGA381BXR	IC(EEPROM)(*1)	
	IC4	C3FBLY000125	IC (*1)	
			(TRANSISTORS)	
	Q2	B1ADGE000012	TRANSISTOR(SI)	
	Q4	B1ABGE000011	TRANSISTOR(SI)	
	Q5	B1ADCF000040	TRANSISTOR(SI)	
	Q6	B1ADCF000040	TRANSISTOR(SI)	
	Q7	B1ABDF000017	TRANSISTOR(SI)	
	Q9	B1ABDF000017	TRANSISTOR(SI)	
	Q10	B1ADNB000003	TRANSISTOR(SI)	
	Q11	2SC6054JSL	TRANSISTOR(SI)	S
	Q12	B1ADCF000040	TRANSISTOR(SI)	
			(DIODES)	
	D1	B0JCMC000006	DIODE(SI)	
	D3	B0JCDD000001	DIODE(SI)	
	D13	MA8043	DIODE(SI)	S
	D14	MA8043	DIODE(SI)	S
	D21	MA8043	DIODE(SI)	S
	D22	MA8043	DIODE(SI)	S
	D801	B0DCCD000013	DIODE(SI)	
	D802	B0DCCD000013	DIODE(SI)	
			(LEDS)	
	LED1	B3ACB0000216	LED	
	LED2	B3ACB0000216	LED	
	LED3	B3ACB0000216	LED	
	LED4	B3ACB0000190	LED	
	LED5	B3ACB0000190	LED	
	LED6	B3ACB0000190	LED	
	LED7	B3ACB0000190	LED	
	LED8	B3ACB0000190	LED	
	LED9	B3ACB0000190	LED	
	LED12	B3ACB0000216	LED	
			(COILS)	
	L802	G1C4N7Z00006	COIL	
	L803	G1C4N7Z00006	COIL	
	L826	G1C4N7Z00006	COIL	
	L863	G1C1N5Z00007	COIL	
	L864	G1C1N5Z00007	COIL	
			(RESISTOR ARRAYS)	
	RA1	D1H810240004	RESISTOR ARRAY	S
	RA4	D1H433220001	RESISTOR ARRAY	
	RA30	D1H84714A013	RESISTOR ARRAY	S
	RA31	D1H447120002	RESISTOR ARRAY	
	RA32	EXB28V101JX	RESISTOR ARRAY	
	RA40	EXB28V103	RESISTOR ARRAY	
	RA61	D1H422120001	RESISTOR ARRAY	
			(IC FILTERS)	
	L9	J0JCC0000287	IC FILTER	
	L46	J0JDC0000045	IC FILTER	
	L47	J0JDC0000045	IC FILTER	
	L48	J0JDC0000045	IC FILTER	
	L72	J0JCC0000276	IC FILTER	
	L308	J0JCC0000286	IC FILTER	
			(RESISTORS)	
	R3	ERJ2GEJ102	1k	S
	R4	ERJ8GEYJ3R3	3.3	S
	R5	ERJ2GEJ122	1.2k	S
	R6	ERJ2GEJ224	220k	S
	R7	ERJ2GEJ103	10k	S
	R8	ERJ2GEJ303	30k	S
	R9	ERJ2GEJ303	30k	S
	R10	ERJ2GEJ152	1.5k	S
	R11	ERJ3GEYJ1R0	1	S
	R13	ERJ2GEJ681	680	S
	R14	ERJ2GEJ102	1k	S
	R18	ERJ2RKF1003	100k	
	R19	ERJ2RKF3302	33k	
	R20	ERJ2GEJ100	10	S
	R22	ERJ2GEJ332	3.3k	S
	R23	ERJ2GEJ102	1k	S
	R25	ERJ2GEJ222	2.2k	S
	R27	ERJ2GEJ821	820	S
	R28	ERJ2GEJ821	820	S
	R29	ERJ2GEJ102	1k	S
	R30	ERJ2GEJ152	1.5k	S
	R31	ERJ2GEJ103	10k	S
	R32	ERJ2GEJ104	100k	S
	R34	ERJ2GEJ104	100k	S
	R45	ERJ6RSJR10V	0.1	
	R50	ERJ2GEJ103	10k	S
	R51	ERJ2GEJ331	330	S
	R52	ERJ2GEJ331	330	S
	R53	ERJ2GEJ332	3.3k	S
	R54	ERJ2GEJ103	10k	S
	R55	ERJ2GEJ102	1k	S
	R63	ERJ2GEJ101	100	S
	R64	ERJ2GEJ103	10k	S
	R66	ERJ2GEJ102	1k	S
	R76	ERJ2GEJ1R0	1	S
	R77	ERJ2GEJ1R0	1	S
	R100	ERJ2GEJ104	100k	S
	R203	D0GA563ZA006	56k	
	R215	ERJ2GE0R00	0	S
	R306	ERJ2GEJ101	100	S
	R806	ERJ2GEJ221	220	S
	R807	ERJ2GEJ221	220	S
	L74	ERJ2GEJ100	10	S
	L850	ERJ3GEY0R00	0	S
			(CAPACITORS)	
	C1	EEE0JA221WP	220	
	C2	EEE0JA221WP	220	
	C3	EEE0JA221WP	220	
	C5	ECUE1A104KBQ	0.1	
	C10	ECUV1A225KBV	2.2	
	C11	ECUE1A104KBQ	0.1	
	C12	PQCUV0J106KB	10	
	C13	ECUE1A104KBQ	0.1	
	C14	ECUE1C103KBQ	0.01	
	C16	PQCUV0J106KB	10	
	C19	ECUE1H102KBQ	0.001	
	C32	ECUE1A104KBQ	0.1	
	C33	ECUE1A104KBQ	0.1	
	C34	ECUE1A104KBQ	0.1	
	C35	ECUE1A104KBQ	0.1	
	C36	ECUE1H101JCQ	100p	
	C40	ECUE1A104KBQ	0.1	
	C43	ECUE1H100DCQ	10p	
	C44	ECUE1A104KBQ	0.1	
	C45	ECUE1A104KBQ	0.1	
	C46	ECUE1H100DCQ	10p	
	C47	ECUV1A105KBV	1	
	C49	ECUV1A105KBV	1	
	C50	ECUV1A105KBV	1	
	C51	ECUV1A105KBV	1	
	C52	PQCUV0J106KB	10	
	C53	PQCUV1A225KB	2.2	
	C54	ECUE1H100DCQ	10p	
	C55	ECUE1H100DCQ	10p	
	C70	ECUE1H181JCQ	180p	
	C71	ECUE1H181JCQ	180p	
	C72	ECUE1H820JCQ	82p	
	C73	ECUE1H820JCQ	82p	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C76	ECUE1H222KBQ	0.0022	
	C77	ECUE1H222KBQ	0.0022	
	C78	ECUE1H100DCQ	10p	
	C79	ECUE1H100DCQ	10p	
	C82	ECUE1H471KBQ	470p	
	C83	ECUE1H100DCQ	10p	
	C86	PQCUV0J106KB	10	
	C96	ECUE1H100DCQ	10p	
	C97	ECUE1H100DCQ	10p	
	C103	ECUE1H101JCQ	100p	
	C104	ECUE1H100DCQ	10p	
	C105	ECUE1H101JCQ	100p	
	C110	ECUE1H102KBQ	0.001	
	C113	ECUE1H100DCQ	10p	
	C127	ECUE1H102KBQ	0.001	
	C172	ECUE1A104KBQ	0.1	
	C174	ECUV1C105KBV	1	
	C175	ECUV1C105KBV	1	
	C184	ECUE1H100DCQ	10p	
	C185	ECUE1H102KBQ	0.001	
	C188	ECUE0J105KBQ	1	
	C189	ECUE0J105KBQ	1	
	C340	ECUE1H100DCQ	10p	
	C343	ECUE1A104KBQ	0.1	
	C344	ECUE1A104KBQ	0.1	
	C345	ECUE1H100DCQ	10p	
	C580	ECUE1H100DCQ	10p	S
	C701	ECUV1A105KBV	1	
	C702	ECUE1H100DCQ	10p	
	C704	ECUE1A104KBQ	0.1	
	C805	F1G1H1R8A798	1.8p	
	C806	F1G1H1R8A798	1.8p	
	C809	F1G1H100A722	10p	
	C810	F1G1HR60A798	0.6p	
	C811	F1G1H100A722	10p	
	C812	F1G1H1R6A798	1.6p	
	C813	F1G1HR60A798	0.6p	
	C814	F1G1H100A722	10p	
	C820	F1G1H3R9A798	3.9p	
	C822	F1G1H100A722	10p	
	C825	F1G1H100A722	10p	
	C826	F1G1H100A722	10p	
	C827	F1G1H1R8A798	1.8p	
	C838	F1G1H100A722	10p	
	C850	F1G1H3R0A798	3p	
	C851	F1G1H2R0A798	2p	
	C865	ECUE1H100DCQ	10p	
	C866	ECUV1A105KBV	1	
			(OTHERS)	
	MIC100	L0CBAY000053	MICROPHONE	
	E101	L5DYBYY00001	LIQUID CRYSTAL DISPLAY (*2)	
	E102	PNHR1543Z	TRANSPARENT PLATE, LCD	PMMA-HB
	E103	PNHR1542Z	GUIDE, LCD	ABS-HB
	E104	PNHX1470Z	COVER, LCD	
	E105	PQHG10729Z	RUBBER PARTS, RECEIVER	
	E106	PNMC1032Z	CASE, MAGNETIC SHIELD	
	E107	PNVE1002Z	BATTERY TERMINAL	ABS-HB
	CN4	K2HD103D0001	JACK	
⚠	F1	K5H252Y00002	FUSE	
	X1	H0J103500039	CRYSTAL OSCILLATOR (*1)	

16.4.3. Accessories

Note:

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

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	A1	PNLV226BX0Z	AC ADAPTOR	
	A2	PQJA10075Z	CORD, TELEPHONE	
	A3	PNKE1098Z1	HANGER, BELT CLIP	ABS-HB

16.4.4. Screws

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

16.4.5. Fixtures and Tools

Note:

(*1) See **Equipment Required** (P.49), and **The Setting Method of JIG** (P.49)

(*2) When replacing the Handset LCD, See **How to Replace the Handset LCD** (P.48)

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
		PQZZ1CD300E	JIG CABLE (*1)	
		PNZZTG3821BX	BATCH FILE CD-ROM (*1)	
		PQZZ430PIR	TIP OF SOLDERING IRON (*2)	
		PQZZ430PRB	RUBBER OF SOLDERING IRON (*2)	