# Service Manual

Caller ID Compatible



KX-TGA731BXM/BXT BXB/BXF/BXS (Handset)



KX-TG7331BXM/BXT (Base Unit)



(Charger Unit)

#### Configuration for each model

Model No	Base Unit	Handset	Charger Unit	Expandable
KX-TG7331	1 (TG7331)	1 (TGA731)		Up to 6
KX-TGA731*		1 (TGA731)	1	

<sup>\*</sup> KX-TGA731 is also an optional accessory, which contains a handset and a charger.

Telephone Equipment
Model No. KX-TG7331BXM
KX-TG7331BXT
KX-TGA731BXM
KX-TGA731BXT
KX-TGA731BXB
KX-TGA731BXF
KX-TGA731BXF

# Digital Cordless Phone

M: Metallic Grey Version
T: Titanium Black Version
B:Black Version
F:Metalic Blue Version
S:Silver Version
(for Asia, Middle Near East and other areas)

**Panasonic** 

# **MARNING**

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  $\triangle$  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 sllightly from the actual product.

#### Note for TABLE OF CONTENTS:

Because sections 5, 6 and 7 of this manual are extract from the operating instructions for this model, they are subject to change without notice. You can download and refer to the original operating instructions on TSN Server for further information.

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# 1 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:

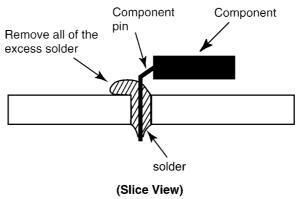
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead

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.

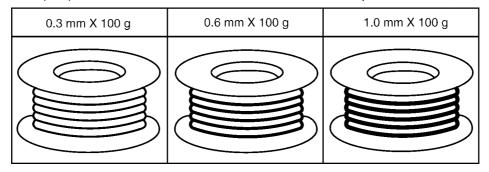
#### Caution

- 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).



# 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.



# 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.

# **Specifications**

#### ■ Standard:

**DECT (Digital Enhanced Cordless** 

Telecommunications),

GAP (Generic Access Profile)

■ Number of channels:

120 Duplex Channels

■ Frequency range: 1.88 GHz to 1.90 GHz

■ Duplex procedure:

TDMA (Time Division Multiple Access)

■ Channel spacing:

1,728 kHz

■ Bit rate:

1,152 kbit/s

■ Modulation:

GFSK (Gaussian Frequency Shift Keying)

■ RF transmission power:

Approx. 10mW (average power per channel)

■ Voice coding: ADPCM 32 kbit/s ■ Power source (AC Adaptor):

220-240 V AC, 50/60 Hz Base unit: PQLV207BXU Charger: PQLV209BXU ■ Power consumption

Base unit:

Standby: Approx. 2.3 W Maximum: Approx. 6.0 W

Charger:

Standby: Approx. 1.0 W Maximum: Approx. 5.4 W ■ Operating conditions:

5 °C–40 °C, 20 %–80 % relative air humidity

(dry)

**■** Dimensions:

Base unit: Approx. 64 mm x 149 mm x 128 mm Handset: Approx. 150 mm x 48 mm x 35 mm Charger: Approx. 51 mm x 75 mm x 88 mm

■ Mass (weight):

Base unit: Approx. 260 g Handset: Approx. 130 g Charger: Approx. 60 g

#### Note:

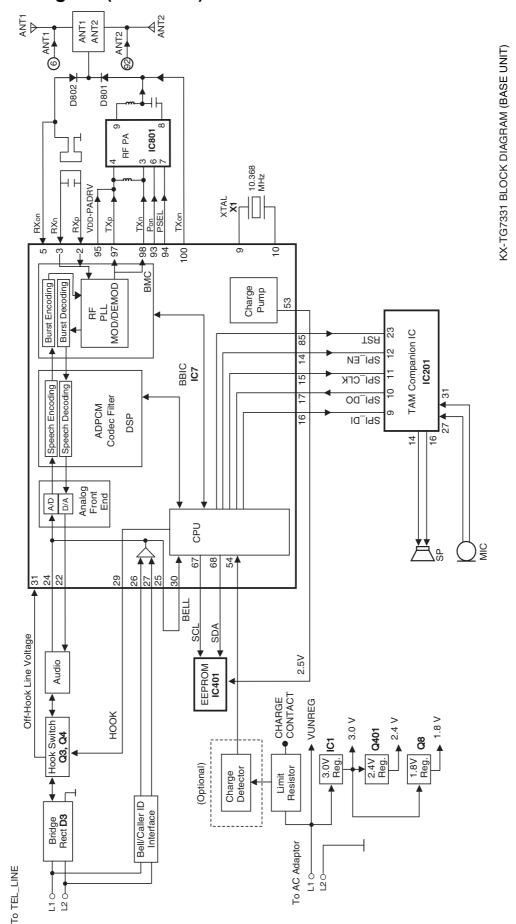
· Design and specifications are subject to change.

#### **Note for Service:**

- Operation range: Up to 300 m outdoors, Up to 50 m indoors, depending on the condition.
- · Analog telephone connection: Telephone Line

# 4 Technical Descriptions

# 4.1. Block Diagram (Base Unit)



# 4.2. Circuit Operation (Base Unit)

#### 4.2.1. **Outline**

Base Unit consists of the following ICs as shown in Block Diagram (Base Unit) (P.7).

- DECT BBIC (Base Band IC): IC7
  - Handling all the audio, signal and data processing needed in a DECT base unit
  - Controlling the DECT specific physical layer and radio section (Burst Module Controller section)
  - ADPCM code filter for speech encoding and speech decoding (DSP section)
  - Echo-cancellation and Echo-suppression (DSP section)
  - Any tones (tone, sidetone, ringing tone, etc.) generation (DSP section)
  - DTMF receiver (DSP section)
  - Clock Generation for RF Module
  - ADC, DAC, timer, and power control circuitry
  - PLL Oscillator
  - Detector
  - Compress/Expander
  - First Mixer
  - All interfaces (ex: RF Power Amp, EEPROM, LED, Analog Front End, etc.)
- RF Power Amp.: IC801
  - Amplifier for transmission and reception
- EEPROM: IC401
  - Temporary operating parameters (for RF, etc.)
- TAM Companion: IC201
  - Voice Compression
- · Additionally,
  - Power Supply Circuit (+3.0 V, +2.4 V, +1.8 V output)
  - Crystal Circuit (10.368 MHz)
  - Charge Circuit
  - Telephone Line Interface Circuit

# 4.2.2. Power Supply Circuit

The power is supplied to the DECT BBIC, RF Module, EEPROM and Charge Contact from AC Adaptor (+6.5 V) as shown in Fig.101. The power supply is as follows;

• DECT BBIC (IC7):

DC Jack (+6.5 V)  $\rightarrow$  IC1  $\rightarrow$  IC7

DC Jack (+6.5 V)  $\rightarrow$  IC1  $\rightarrow$  Q401  $\rightarrow$  IC7

DC Jack (+6.5 V)  $\rightarrow$  IC1  $\rightarrow$  Q8  $\rightarrow$  IC7

• RF Power Amp. (IC801):

DC Jack (+6.5 V)  $\rightarrow$  IC1  $\rightarrow$  IC801 (Power AMP)

• EEPROM (IC401):

DC Jack (+6.5 V)  $\rightarrow$  IC1  $\rightarrow$  IC7 $\rightarrow$  IC401

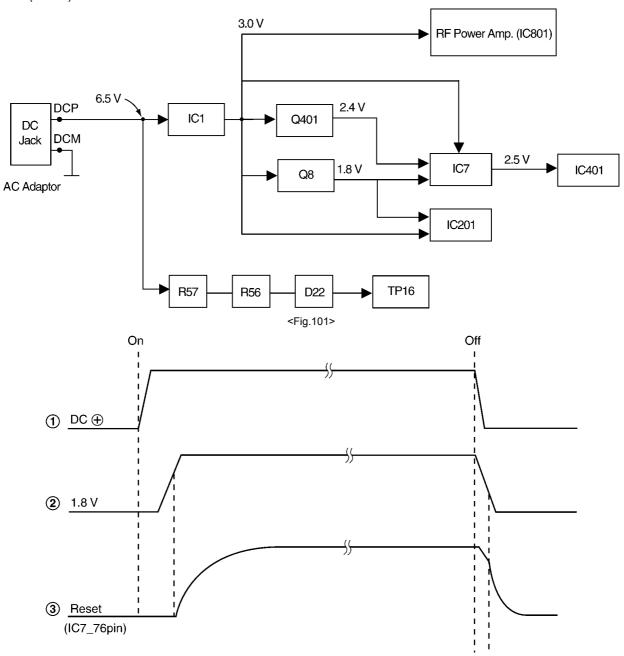
• TAM Companion (IC201):

DC Jack (+6.5 V)  $\rightarrow$  IC1  $\rightarrow$  Q8  $\rightarrow$  IC201

DC Jack (+6.5 V)  $\rightarrow$  IC1  $\rightarrow$  IC201

• Charge Contact (TP16):

DC Jack (+6.5 V)  $\rightarrow$  R57  $\rightarrow$  R56  $\rightarrow$  D22  $\rightarrow$  TP16



KX-TG7331BX//KX-TGA731BX

## 4.2.3. Telephone Line Interface

#### <Function>

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

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

In the standby mode, Q3 is open to cut the DC loop current and decrease the ring load.

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

- B  $\rightarrow$  L2  $\rightarrow$  C4  $\rightarrow$  R6  $\rightarrow$  R33  $\rightarrow$  IC7 Pin 27 (CID INp)
- A  $\rightarrow$  L1  $\rightarrow$  C3  $\rightarrow$  R4  $\rightarrow$  R35  $\rightarrow$  IC7 Pin 26 (CID INn)

#### **ON/OFF** hook circuit:

In the standby mode, Q3 is open, and connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an **on-hook condition**.

When IC7 detects a ring signal or press the TALK Key onto the handset, Q4 turns on and then Q3 turns on, thus providing an **off-hook condition** (DC current flows through the circuit) and the following signal flow makes the loop current.

 $\bullet \; \mathsf{B} \to \mathsf{L2} \to \!\! \mathsf{D3} \to \mathsf{Q3} \to \mathsf{Q3} \to \mathsf{Q5} \to \mathsf{R21} \to \mathsf{R22} \to \mathsf{D3} \to \mathsf{L1} \to \!\! \mathsf{A} \qquad \quad [\text{OFF HOOK}]$ 

#### 4.2.4. Transmitter/Receiver

· Audio Circuits and DTMF tone signal circuits.

Base Unit and Handset mainly consist of RF Module and DECT BBIC.

Base Unit and Handset transmit/receive voice signal and data signal through the antenna on carrier frequency.

#### Signal Path:

\*Refer to Signal Route (P.14).

#### 4.2.4.1. Transmitter Block

The voice signal input from the TEL LINE interface goes to RF Power Amp. (IC801) through DECT BBIC (IC7) as shown in **Block Diagram (Base Unit)** (P.7)

The voice signal passes through the analog part of IC7 where it is amplified and converted to a digital audio stream signal. The burst switch controller processes this stream performing encryption and scrambling, adding the various other fields to produce the GAP (Generic Access Profile) standard DECT frame, assigning to a time slot and channel etc.

In IC7, the carrier frequency is changing, and frequency modulated RF signal is generated. In IC801, RF signal is amplified, and radiated from antenna. Handset detects the voice signal or data signal in the circuit same as the following explanation of Receiver Block.

#### 4.2.4.2. Receiver Block

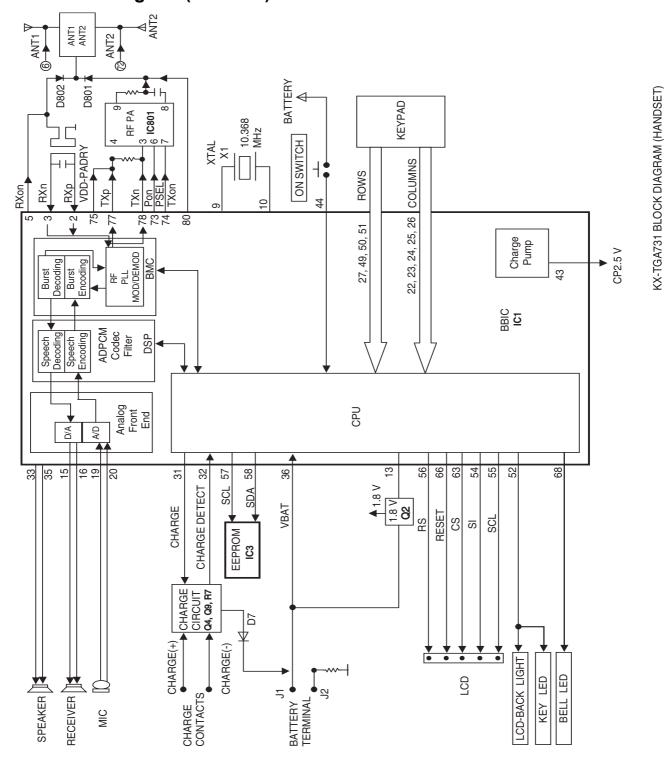
The signal of 1900 MHz band (1881.792 MHz ~ 1897.344 MHz) which is input from antenna is input to IC7 as shown in **Block Diagram (Base Unit)** (P.7).

In IC7, the signal of 1900 MHz band is downconverted to 864 kHz signal and demodulated, as GAP (**G**eneric **A**ccess **P**rofile) standard DECT frames. It passes through the decoding section burst switch controller where it separates out the frame information and performs de-encryption and de-scrambling as required. It then goes to the DSP section where it is turned back into analog audio. This is amplified by the analog front end, and goes to the TEL LINE Interface.

#### 4.2.5. Pulse Dialling

During pulse dialling the hookswitch (Q3,Q4) is used to generate the pulses using the HOOK control signal, which is set high during pulses. To force the line impedance low during the "pause" intervals between dial pulses, the PULSE\_DIAL signal turns on Q2.

# 4.3. Block Diagram (Handset)



# 4.4. Circuit Operation (Handset)

#### 4.4.1. Outline

Handset consists of the following ICs as shown in Block Diagram (Handset) (P.11).

- DECT BBIC (Base Band IC): IC1
  - All data signals (forming/analyzing ACK or CMD signal)
  - All interfaces (ex: Key, Detector Circuit, Charge, DC/DC Converter, EEPROM, LCD, RF Power Amp.)
  - PLL Oscillator
  - Detector
  - Compress/Expander
  - Reception
- RF Power Amp: IC801
  - Amplifier for transmission
- EEPROM: IC3
  - Temporary operating parameters (for RF, etc.)

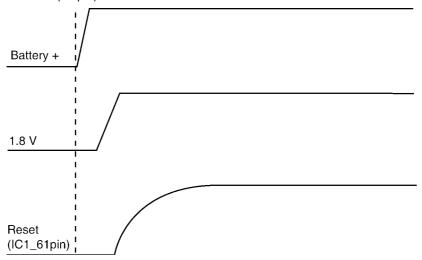
## 4.4.2. Power Supply Circuit/Reset Circuit

#### **Circuit Operation:**

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

BATTERY(2.2 V ~ 2.6 V: BATT+)  $\rightarrow$  F1  $\rightarrow$  Q2 (1.8 V), IC1-43pin (2.5V)

The Reset signal generates IC1 (61 pin) and 1.8 V.



# 4.4.3. Charge Circuit

#### **Circuit Operation:**

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

 $DC+(6.5 \text{ V}) \rightarrow R57 \rightarrow D22 \rightarrow R56 \rightarrow R55 \rightarrow CHARGE+(Base) \rightarrow CHARGE+(Handset) \rightarrow L4 \rightarrow Q4 \rightarrow D7 \rightarrow F1 \rightarrow BAT-TERY+... \ Battery...$ 

 $\mathsf{BATTERY-} \to \mathsf{L8} \to \mathsf{R45} \to \mathsf{GND} \to \mathsf{L5} \to \mathsf{CHARGE-}(\mathsf{Handset}) \to \mathsf{CHARGE-}(\mathsf{Base}) \to \mathsf{GND} \to \mathsf{DC-}(\mathsf{GND})$ 

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

The charge current is controlled by switching Q9 of Handset.

Refer to Fig.101 in Power Supply Circuit (P.9).

#### 4.4.4. Battery Low/Power Down Detector

#### **Circuit Operation:**

"Battery Low" and "Power Down" are detected by BBIC which check the voltage from battery.

The detected voltage is as follows;

· Battery Low

Battery voltage: V(Batt) ≤ 2.25 V ± 50 mV

The BBIC detects this level and " starts flashing.

Power Down

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

The BBIC detects this level and power down.

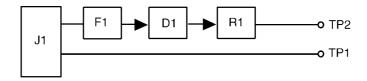
#### 4.4.5. Speakerphone

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

# 4.5. Circuit Operation (Charger Unit)

# 4.5.1. Power Supply Circuit

The power supply is as shown.



AC Adaptor

# 4.6. Signal Route

```
SIGNAL
                                        ROUTE
SIGNAL ROUTE I
                IN -
                                                                    OUT
DTMF TONE
              (BASE UNIT)
TEL OUT
              IC7 (22) - R25 - R29 - C22 - Q5 - Q3 - D3 - L1 - A
                                           L<sub>L2</sub> - B
(to Tel Line)
              (BASE UNIT)
DTMF TONE
              A - L1 — D3 - Q3 - R18 - C19 - R26 - IC7 (24)
TEL IN
(from Tel Line)
CDL TX
             (HANDSET)
             (to Tel Line)
             D801 - C801 - C803 - DA1 R107 - ANT1 to BASE
             (BASE UNIT)
             from HANDSET ANT1 - C101 - DA1 - C803 - C801 - D802 - C826 - C832 - IC7 (3)
                         ANT2 - C102 -
                                                             - C833 - IC7 (2)
               - IC7 (22) - R25 - R29 - C22 - Q5 - Q3 - D3 TL1 - A
           🕆 (BASE UNIT)
CDL RX
           (from Tel Line)

→ IC801 (9) -
             L802 - L804 - C812 - D801 - C801 - C803 - DA1 ___ C101 - ANT1 to HANDSET
           I (HANDSET)
           IC (16) - RECEIVER (+) IC (15) - RECEIVER (-)

→ (BASE UNIT)

Caller ID
           (from Tel Line)
           D801 - C801 - C803 - DA1 C101 - ANT1 to HANDSET
SP-PHONE TX |-- (HANDSET)
             (to Tel Line)
             D801 - C801 - C803 - DA1 T R107 - ANT1 to BASE
             (BASE UNIT)
             from HANDSET ANT1 - C101 — DA1 - C803 - C801 - D802 - C826 - ANT2 - C102 —
                                                            C832 - IC7 (3)
                                                            C833 - IC7 (2)
             ___ IC7 (22) - R25 - R29 - C22 - Q5 - Q3 - D3 ___ L1 - A
                                           L2 - B
SP-PHONE RX
            (BASE UNIT)
             (to Tel Line)
                                               └ IC7 (98) - IC801 (3) ┘
             L802 - L804 - C812 - D801 - C801 - C803 - DA1 \perp C101 - ANT1 to HANDSET
             (HANDSET)
             from BASE UNIT ANT1 - R107 DA1 - C803 - C801 - D802 - C826 C832 - IC1 (3) ANT2 - R108 C833 - IC1 (2)
                          ANT2 - R108 🗐
               · IC (33) - SP (-)
             T IC (35) - SP (+)
```

# 5 Location of Controls and Components

# 5.1. Controls

# 5.1.1. Base Unit

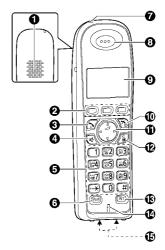


- 1 Charge contacts
- Speaker
- [▲]/[▼]: To adjust the ringer and speaker volumes.
   [◄]/[►]: To select the desired
- ringer tone.

  O Dial keypad
- (Locator/Intercom)
- 1 In use indicator
- **⑦** 【 】 (Redial)
- (Pause)
- Microphone
- (R) (Recall/Flash)
- (Program/Speed dial)

## 5.1.2. Handset

#### **Handset**



- Speaker
- Soft keys
- **❸** [ ↑ ] (Talk)
- **④** [♣] (Speakerphone)
- O Dial keypad
- **③** [R/⊕]
  - R: Recall/Flash
  - ①: Alarm shortcut key
- Charge indicator Ringer indicator
- Receiver
- O Display
- Navigator key ([▲]/[▼]/[▼]/[►])
   ✓ (Volume: [▲]/[▼])
- ② 【C/☒】(Clear/Mute)
- (INT) (Intercom)
- Microphone
- ( Charge contacts

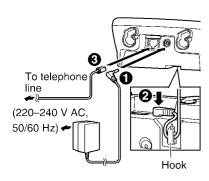
# 6 Installation Instructions

## 6.1. Connections

Connect the AC adaptor cord (1) by pressing the plug firmly (2). Connect the telephone line cord until it clicks into the base unit and telephone line jack (3).

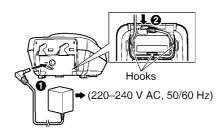
#### Base unit

- Use only the supplied Panasonic AC adaptor PQLV207BXU.
- Use only the supplied telephone line cord.
   Using another telephone line cord may not allow the unit to work properly.



#### Charger

• Use only the supplied Panasonic AC adaptor PQLV209BXU.



#### Note:

- The AC adaptor must remain connected at all times.
   (It is normal for the adaptor to feel warm during use.)
- The AC adaptor should be connected to a vertically oriented or floor-mounted AC outlet. Do not connect the AC adaptor to a ceiling-mounted AC outlet, as the weight of the adaptor may cause it to become disconnected.

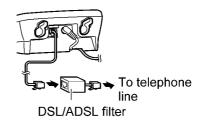
#### During a power failure

 The unit will not work during a power failure.
 We recommend connecting a corded-type telephone (without AC adaptor) to the same telephone line or to the same telephone line jack using a T-adaptor.

#### If you subscribe to a DSL/ADSL service

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

- -noise is heard during conversations.
- -Caller ID features do not function properly.



# 6.2. Battery

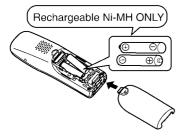
# 6.2.1. Battery Installation and Replacement

#### Important:

- Use the supplied rechargeable batteries (Part No. HHR-55AAAB).
- When installing the batteries:
  - Wipe the battery ends (⊕, ⊖) with a dry cloth.
  - Avoid touching the battery ends (⊕, ⊝) or the unit contacts.
  - Confirm correct polarities (⊕, ⊝).
- When replacing the batteries:
  - USE ONLY rechargeable Ni-MH batteries AAA (R03) size.
  - Do NOT use Alkaline/Manganese/Ni-Cd batteries.
  - We recommend using the Panasonic rechargeable batteries HHR-4MPT.
- 1 Firmly press the notch on the handset cover and slide it in the direction of the arrow.



2 Insert the batteries negative (○) end first. Close the handset cover.



#### Important:

If the handset does not automatically turn on after installing/replacing batteries, press [> 0] for about 1 second, or place the handset on the base unit or charger.

#### Note

• When replacing batteries, remove the old batteries.

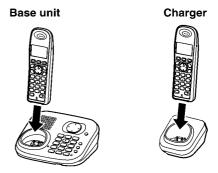


See For Service Hint (P.24)

## 6.2.2. Battery Charge

Place the handset on the base unit or charger for about 7 hours before initial use.

While charging, "Charging" is displayed and the charge indicator on the handset lights up. When the batteries are fully charged, "Charge Completed" displays. The charge indicator stays lit even after the batteries are fully charged.



#### Note:

- It is normal for the handset to feel warm during charging.
- If you want to use the unit immediately, charge the batteries for at least 15 minutes.
- Clean the charge contacts of the handset, base unit, and charger with a soft, dry cloth. Clean if the unit is exposed to grease, dust, or high humidity.

#### Note for service:

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

# 6.2.3. Battery Level

Battery icon	Battery level
	High
	Medium
	Low  When flashing: Needs charging.

# 6.2.4. Panasonic Ni-MH Battery Performance (supplied batteries)

Operation	Operating time
In continuous use	17 hours max.
Not in use	150 hours max.
(standby)	

#### Note:

- It is normal for batteries not to reach full capacity at the initial charge. Maximum battery performance is reached after a few complete cycles of charge/ discharge (use).
- Actual battery performance depends on a combination of how often the handset is in use and how often it is not in use (standby).
- Even after the handset is fully charged, the handset can be left on the base unit or charger without any ill effect on the batteries.
- The battery level may not be displayed correctly after you replace the batteries. In this case, place the handset on the base unit or charger and let it charge for at least 7 hours.

# 7 Operating Instructions

# 7.1. Programmable Settings

You can customise the unit by programming the following features using the handset.

## Programming by scrolling through the display menus

- 1 (middle soft key)
- 2 Press  $[\, \, ]$  or  $[\, \, ]$  to select the desired top-menu.  $\longrightarrow$   $\bigcirc K$
- 3 Press [V] or [A] to select the desired item in sub-menu 1.  $\rightarrow$  OK
  - ullet In some cases, you may need to select from sub-menu 2. ullet OK
- 4 Press (▼) or (▲) to select the desired setting. → **OK** 
  - This step may vary depending on the feature being programmed.
  - To exit the operation, press [★①].

#### Note:

- For other top-menus, please refer to each chapter.
- In the following table, < > indicates the default settings.
- The current item or setting is highlighted on the display.

Top-menu	Sub-menu 1	Sub-menu 2	Remarks (Selectable options)
Handset Setup	Time Settings	Set Date & Time*1*2*3	_
		Alarm	Off/Once/Daily
		Time Adjustment *2*3 <manual></manual>	Caller ID [Auto]/Manual
	Ringer Setup	Ringer Volume <maximum></maximum>	Off/Volume 1 to 6 *9
		Ringtone *4*5 <ringtone 1=""></ringtone>	15 (5 tone + 10 melody)
	Display Setup	Select Language <english></english>	3 languages selectable
		Contrast <level 3=""></level>	Contrast 1 to 6 *9
	Register H.set <sup>1</sup>	_	See "Registering a Handset to the Base Unit"
	Keytones <sup>*6</sup> <on></on>	<del>-</del>	On/Off
	Auto Talk*7 <off></off>	_	On/Off
Base Unit Setup *3	Dial Mode <tone></tone>	_	Tone/Pulse
	Recall/Flash*8 <600 msec.>	_	80/90/100/110/160/200/250/300/ 400/600/700/900 msec
	Area Code	_	Up to 1 number (5 digits)
	Base Unit PIN <0000>	_	"0000" - "9999" (4 digits)
	Repeater Mode <sup>*1</sup> <off></off>	_	On/Off

- \*1 The item will not be reset when pressing 1, 5, 9 and  $\times$  key of the handset. Refer to **How to Clear User Setting** (P.31).
- \*2 The item will not be reset when pressing (3), (5), (7) and (#) keys. Refer to **How to Clear User Setting** (P.31).
- \*3 If you program these settings using one of the handsets, you do not need to program the same item using another handset.
- \*4 IIf you select one of the melody ringer tones, the ringer tone continues to play for several seconds even if the caller has already hung up. You may either hear a dial tone or no one on the line when you answer the call.
- \*5 The preset melodies in this product are used with permission of © 2007 Copyrights Vision Inc.
- \*6 Turn this feature off if you prefer not to hear key tones while you are dialling or pressing any keys, including confirmation tones and error tones.
- \*7 If you subscribe to a Caller ID service and want to view the caller's information after lifting up the handset to answer a call, turn off this feature.
- \*8 The recall/flash time depends on your telephone exchange or host PBX. Contact your PBX supplier if necessary.
- \*9 The items are not shown on the display.

#### **Cross Reference:**

Registering a Handset to the Base Unit (P.19)

# 7.2. Registering a Handset to the Base Unit

The supplied handset and base unit are pre-registered. If for some reason the handset is not registered to the base unit (for example,  $\Upsilon$  flashes even when the handset is near the base unit), re-register the handset.

- 1 Handset:
  - (middle soft key)
- 2 [▼]/[▲]: "Handset Setup" → OK
- 3 [▼]/[▲]: "Register H.set" → OK
- 4 Base unit:

Press and hold (3)) for about 5 seconds, until the registration tone sounds.

- If all registered handsets start ringing, press the same button to stop. Then repeat this step.
- The next step must be completed within 90 seconds.
- 5 Handset:

Wait until "Enter Base PIN" is displayed.  $\rightarrow$  Enter the base unit PIN (default: "0000").  $\rightarrow$  OK

- If you forget your PIN, see "For Service Hint".
- When the handset has been registered successfully,  $\Upsilon$  stops flashing.

#### Note:

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

#### **Cross Reference:**

For Service Hint (P.24)

## 7.2.1. Deregistering a Handset

A handset can cancel its own registration (or the registration of another handset) that is stored in the base unit. This allows the handset to end its wireless connection with the system.

- 1 (middle soft key)
- 2 【▼】/(▲]: "Base Unit Setup" → OK
- 3 [3][3][5]
- 4 [▼]/[▲]: "Deregistration" → OK
  - The numbers of all handsets registered to the base unit are displayed.
- 5 Select the handset(s) you want to cancel by pressing the desired handset number. -> **OK** 
  - The selected handset number(s) flashes.
  - To cancel a selected handset number, press the number again. The number stops flashing.
- 6 [v]/[A]: "Yes"  $\rightarrow$  OK
  - A confirmation tone sounds as each handset number disappears.
  - The handset does not beep when cancelling its own registration.
- 7 【**\***①】

# 7.3. Copying Phonebook Entries

You can copy phonebook entries to the phonebook of another compatible Panasonic handset.

# 7.3.1. Copying All Entries

- 1  $\bowtie$  (left soft key)  $\rightarrow$   $\implies$
- 2 [V]/[A]: "Copy All"  $\rightarrow$  OK
- 3 Enter the handset number you wish to send the phonebook entry to.
  - When all entries have been copied, "Completed" is displayed.
- 4 [%0]

# 7.4. Dialling Mode

If you cannot make calls, change this setting according to your telephone line service.

The default setting is "Tone".

"Tone": For tone dial service.

"Pulse": For rotary/pulse dial service.

- 1 (middle soft key)
- 2 [v]/[A]: "Base Unit Setup"  $\rightarrow$  OK
- 3 [V]/[A]: "Dial Mode"  $\rightarrow$  OK
- 4 [v]/[ $\blacktriangle$ ]: Select the desired setting.  $\rightarrow$  OK  $\rightarrow$  [ $ilde{\wedge}$ 0]

# 7.5. Error Messages

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

Display message	Cause/solution
Answer Sys. Full <sup>*1</sup>	Erase unnecessary messages.
Check Tel Line	The supplied telephone line cord has not been connected yet or not connected properly. Check the connections.
Error <sup>*1</sup>	Recording was too short. Try again.
Failed	Phonebook copy failed. Confirm the other handset (the receiver) is in standby mode and try again.
Incomplete	The receiver's phonebook memory is full. Erase the unnecessary phonebook entries from the other handset (the receiver) and try again.
Memory Full	<ul> <li>The phonebook memory is full. Erase unnecessary entries.</li> <li>Message memory is full. Erase unnecessary messages.*1</li> </ul>
No link to base. Reconnect AC adaptor.	<ul> <li>The handset has lost communication with the base unit. Move closer to the base unit and try again.</li> <li>Unplug the base unit's AC adaptor to reset the unit. Reconnect the adaptor and try again.</li> <li>The handset's registration may have been cancelled. Re-register the handset.</li> </ul>
Use rechargeable battery.	A wrong type of batteries such as Alkaline or Manganese was inserted. Use only the rechargeable Ni-MH batteries.
You must first subscribe to Caller ID.	You must subscribe to a Caller ID service. Once you receive caller information after subscribing to a Caller ID service, this message will not be displayed.

<sup>\*1</sup> KX-TG7341

# 7.6. Troubleshooting

If you still have difficulties after following the instructions in this section, disconnect the base unit's AC adaptor and turn off the handset, then reconnect the base unit's AC adaptor and turn on the handset.

## General use

Problem	Cause / solution
The unit does not work.	<ul> <li>Make sure the batteries are installed correctly.</li> <li>Fully charge the batteries.</li> <li>Check the connections.</li> <li>Unplug the base unit's AC adaptor to reset the unit and turn off the handset. Reconnect the adaptor, turn on the handset and try again.</li> <li>The handset has not been registered to the base unit. Register the handset.</li> </ul>
I cannot hear a dial tone.	<ul> <li>The base unit's AC adaptor or telephone line cord is not connected. Check the connections.</li> <li>If you are using a splitter to connect the unit, remove the splitter and connect the unit to the wall jack directly. If the unit operates properly, check the splitter.</li> <li>Disconnect the base unit from the telephone line and connect the line to a known working telephone. If the working telephone operates properly, contact our service personnel to have the unit repaired. If the working telephone does not operate properly, contact your service provider/telephone company.</li> </ul>
The handset phonebook entries I copied are not displayed correctly.	<ul> <li>Undisplayable characters are replaced with spaces for entries copied from/to additional handsets other than KX-TGA731BX.</li> </ul>
I do not know how to erase *) (Missed call) from the display.	<ul> <li>There are unviewed missed calls remaining.</li> <li>View them and erase → in the following way.</li> <li>1 (middle soft key)</li> </ul>
	2 [▼]/[▲]: "Caller List" → OK
	3 Press [▼] to search from the most recent call, or press [▲] to search from the oldest call.

# Programmable settings

Problem	Cause / solution
I have changed the display language to a language I cannot read.	Change the display language.
While programming, the handset starts to ring.	<ul> <li>A call is being received. Answer the call and start again after hanging up.</li> </ul>
I cannot register a handset to a base unit.	<ul> <li>The maximum number of handsets (6) is already registered to the base unit. Cancel unused handset registrations from the base unit.</li> <li>You entered the wrong PIN. If you forget your PIN, see "For Service Hint".</li> <li>Place the handset and the base unit away from other electrical appliances.</li> </ul>

**Cross Reference:** 

For Service Hint (P.24)

# Battery recharge

Problem	Cause / solution
The handset beeps and/or	Battery charge is low. Fully charge the batteries.
flashes.	
I fully charged the batteries,	<ul> <li>Clean the charge contacts and charge again.</li> </ul>
but <b>t</b> still flashes.	• It is time to replace the batteries.
I fully charged the batteries,	<ul> <li>Clean the battery ends (⊕, ⊕) and the charge</li> </ul>
but the operating time seems	contacts with a dry cloth, and charge again.
to be shorter.	
The handset display is blank.	● The handset is not turned on. Turn the power on.

# Making/answering calls, intercom

Problem	Cause/solution
♥ is flashing.	<ul> <li>The handset is not registered to the base unit. Register it.</li> <li>The handset is too far from the base unit. Move closer.</li> <li>The base unit's AC adaptor is not connected. Check the connections.</li> <li>You are using the handset or base unit in an area with high electrical interference. Re-position the base unit and use the handset away from sources of interference.</li> </ul>
Noise is heard, sound cuts in and out.	<ul> <li>You are using the handset or base unit in an area with high electrical interference. Re-position the base unit and use the handset away from sources of interference.</li> <li>Move closer to the base unit.</li> <li>If you use a DSL/ADSL service, we recommend connecting a DSL/ADSL filter between the base unit and the telephone line jack. Contact your DSL/ADSL provider for details.</li> </ul>
The handset does not ring.	The ringer volume is turned off. Adjust ringer volume.
The base unit does not ring.	The ringer volume is turned off. Adjust ringer volume.
I cannot make a call.	<ul> <li>The dialling mode may be set incorrectly. Change the setting.</li> <li>The handset is too far from the base unit. Move closer and try again.</li> <li>Another unit is in use. Wait and try again later.</li> <li>Answering system is being used by another handset.*1 Wait and try again later.</li> <li>The key lock feature is turned on. Turn it off.</li> </ul>

<sup>\*1</sup> KX-TG7341

# Caller ID

Problem	Cause / solution
Caller information is not displayed.	You must subscribe to a Caller ID service. Contact your service provider/telephone company for details.     If your unit is connected to any additional telephone equipment, remove and plug the unit directly into the wall jack.     If you use a DSL/ADSL service, we recommend connecting a DSL/ADSL filter between the base unit and the telephone line jack. Contact your DSL/ADSL provider for details.     Other telephone equipment may be interfering with this unit. Disconnect the other equipment and try again.
Caller information is slow to display.	<ul> <li>Depending on your service provider/telephone company, the unit may display the caller's information at 2nd ring or later.</li> <li>Move closer to the base unit.</li> </ul>
Time on the unit has shifted.	Incorrect time information from incoming Caller ID changes the time. Set the time adjustment to off.

# Answering system (KX-TG7341)

Problem	Cause/solution
The unit does not record new messages.	<ul> <li>The answering system is turned off. Turn it on.</li> <li>The message memory is full. Erase unnecessary messages.</li> <li>The recording time is set to "Greeting Only". Change the setting.</li> <li>If you subscribe to the voice mail service, messages are recorded by your service provider/telephone company not your telephone. Change the unit's number of rings setting or contact your service provider/telephone company.</li> </ul>
My own greeting message cannot be properly heard.	Record your own greeting message again.
I cannot operate the answering system.	<ul> <li>Someone is using the unit. Wait for the other user to finish.</li> <li>A caller is leaving a message. Wait for the caller to finish.</li> <li>The handset is too far from the base unit. Move closer.</li> </ul>
I cannot operate the answering system remotely.	<ul> <li>You are entering the wrong remote access code. If you have forgotten your remote access code, enter the remote access code setting to check your current code.</li> <li>Press each key firmly.</li> <li>The answering system is turned off. Turn it on.</li> <li>You are using a rotary/pulse telephone. Try again using a touch-tone phone.</li> </ul>
While recording a greeting message or listening to messages, the unit rings and recording stops.	A call is being received. Answer the call and try again later.

# Liquid damage

Problem	Cause / solution
Liquid or other form of moisture has entered the handset/base unit.	Disconnect the AC adaptor and telephone line cord from the base unit. Remove the batteries from the handset and leave to dry for at least 3 days.  After the handset/base unit are completely dry, reconnect the AC adaptor and telephone line cord. Insert the batteries and charge fully before use. If the unit does not work properly, contact your nearest Panasonic service centre.

## Caution:

• To avoid permanent damage, do not use a microwave oven to speed up the drying process.

# 7.7. For Service Hint

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 <b>Battery Charge</b> , you will get a correct indication of the battery strength.			
PIN Code	<ul> <li>Change the PIN using the following method.</li> <li>1</li></ul>			

**Cross Reference:** 

Battery Charge (P.17)

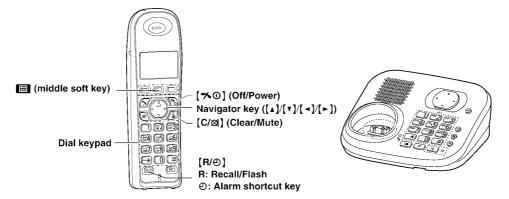
# 8 Service Mode

# 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

1). Register a Handset to a Base Unit. (\*1)

- 2). Press (middle soft key) .
- 3). Select "Base Unit Setup" using [▲] or [▼] then press **OK** .
- 4). Enter "7", "2", "6", "2", "7", "6", "6", "4".

  Note: 7262 7664 = PANA SONI

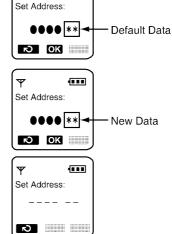
  (see letters printed on dial keys.)
- 5). Select "Write EEPROM" using [▲]or[▼] then press **OK** .
- 6). Enter "●", "●", "●", "●" (Address). (\*2)
- 7). Enter "\*", "\*" (New Data). (\*2)
- 8). Press [ (middle soft key), a long confirmation beep will be heard.
- 9). Press [ \* ①] (off) to return to standby mode.

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









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# KX-TG7331BX//KX-TGA731BX

# Frequently Used Items (Base Unit) ex.)

Items	Address	Default Data	New	Data	Remarks
C-ID (FSK) sensitivity	04 D6	00	01 (6 dB 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	04 E4	50	60 (6 dB up)	70 (12 dB up)	When hex changes from "50" to "60" or "70", gain increases by 6 dB or 12 dB.
Frequency	00 02/00 01	03/50	-	-	Use these items in a READ-ONLY mode to
ID	00 10~00 14	Given value	-	-	confirm the contents. Careless rewriting may cause serious damage to the computer system.
Bell length	01 F5	64 (10 ssec) (*3)	1E (3 sec)	14 (2 sec)	This is time until bell stops ringing. (Unit: 100 ms)
PULSE Dial speed (10PPS -> 20PPS)	03 B2	28 (40msec) (*3)	19 (20msec)	-	This is pulse make time. (Unit:1ms)
	03 B3	3C (60msec) (*3)	19 (30 msec)	-	This is pulse break time. (Unit:1ms)
	01 E4	57 (870msec) (*3)	2C (440msec)	-	This is inter-digit time in pulse mode. (Unit: 10ms)

#### Note:

- (\*1) Refer to **Registering a Handset to the Base Unit** (P.19) (\*2) 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	[R] + 0
1	1	В	[R] + 1
	-	С	[R] + 2
	-	D	[R] + 3
	•	E	[R] + 4
9	9	F	[R] + 5

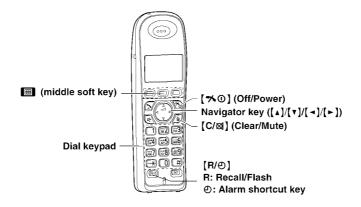
(\*3)

Bell length	64(hex) = 100(dec) → 100 × 100msec = 10000msec (10sec)
•	28 (hex) = 40(dec) → 40 × 1msec = 40msec = 28 (40msec)
(10PPS -> 20PPS)	$3C \text{ (hex)} = 60 \text{ (dec)} \rightarrow 60 \times 1 \text{msec} = 60 \text{msec} = 3C \text{ (60msec)}$
	57 (hex) = 87 (dec) $\rightarrow$ 87 × 10msec = 870msec

## 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

# H/S LCD

1). Press (middle soft key) .

- Caller List
  Handset Setup
  Base Unit Setup
  OK
- 2). Select "Handset Setup" using [▲]or[▼] then press **©**✓ .
- 3). Enter "7", "2", "6", "2", "7", "6", "6", "4".

  Note: 7262 7664 = PANA SONI

  (see letters printed on dial keys.)
- 4). Select "Write EEPROM" using [▲]or[▼] then press OK.
- 5). Enter "●", "●", "●", "●" (Address). (\*1)
- 6). Enter "\*", "\*" (New Data). (\*1)
- 7). Press **OK**, a long confirmation beep will be heard.
- -Engineering Mode Read EEPROM Write EEPROM N OK ■ -Set Address: \*\* Default Data 心 OK ■ -Set Address: \*\* New Data N OK ■ -Set Address: r)
- 8). Press [ 🛪 ] (off) to return to standby mode.

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

KX-TG7331BX//KX-TGA731BX

# Frequently Used Items (Handset)

ex.

Items	Address	Default Data	New Data	Possible Adjusted Value MAX (hex)	Possible Adjusted Value MIN (hex)	Remarks
Sending level	00 06	Adjusted value	Given value	6F	00	(*2)
Receiving level	00 07	Adjust value	Given value	00	3F	(*3)
Battery Low	00 04	70	-	-	-	
Frequency	00 02/00 01	02/F6	-	-	-	(*4)
ID	00 10~00 14	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	Α	[R] + 0
1	1	В	[R] + 1
		С	[R] + 2
		D	[R] + 3
		E	[R] + 4
9	9	F	[R] + 5

(\*2) When adding "01" (hex) to default value, sending level increases by 0.25 dB. ex.)

Item	Default Data	New Data	
	24	28	20
Sending level	-8.5 dBm	-7.5 dBm	-9.5 dBm

(\*3) When reducing "01" (hex) from default value, receiving level increases by 0.25 dB. ex.)

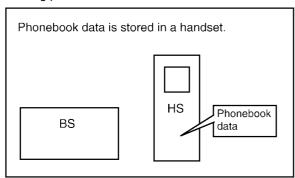
Item	Default Data	New Data	
	14	18	10
Receiving level	-22 dBm	-23 dBm	-21 dBm

(\*4) Use these items in a READ-ONLY mode to confirm the contents. Careless rewriting may cause serious damage to the handset.

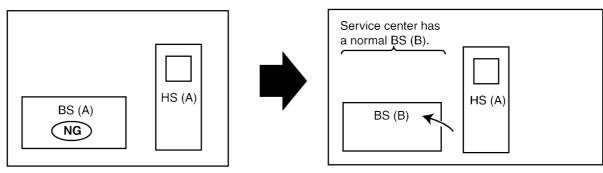
# 8.2. Copying Phonebook Items when Repairing

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.

Available models: KX-TG7331/7341 Refer to the following procedures.



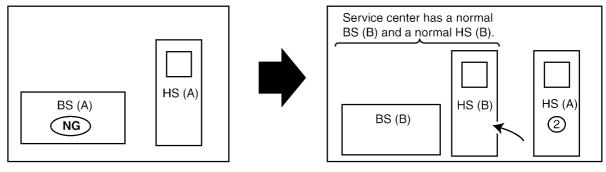
Case 1: A base unit has a defect.
(Replacing a base unit PCB etc...)



 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)

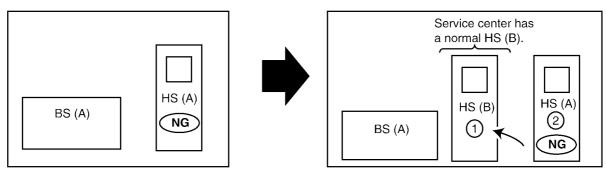


- 1. Register HS (A) to BS (B) as a handset no. 2.
- 2. Copy the phonebook data from HS (A) to HS (B).
- 3. Cancel the HS 2 (HS (A)).

#### Note:

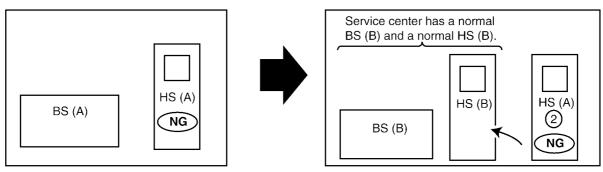
- BS=Base Unit , HS=Handset
- If the max number of handsets are already registered to the base unit, a new handset cannot be registered.
- To register the handset, refer to Registering a Handset to the Base Unit (P.19)
- To cancel the handset, refer to **Deregistering a Handset** (P.19)
- To copy the handset phonebook, refer to Copying Phonebook Entries (P.20)

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.19)
- To cancel the handset, refer to **Deregistering a Handset** (P.19)
- To copy the handset phonebook, refer to Copying Phonebook Entries (P.20)

# 8.3. How to Clear User Setting

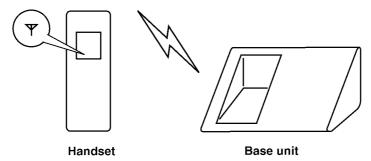
Units are reset to the Factory settings by this operation (Erase recorded Voice messages\*, stored Phone numbers, Caller list and etc.)

#### Note:

- Some menus are not reset. Refer to Operating Instructions (P.18).
- The reset menus differ depending on the following operations.
- This operation should not be performed for a usual repair.
- \* KX-TG7341 only

## 8.3.1. Resetting both base unit and handset

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



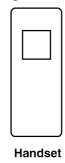
- (1) Connect the AC adaptor to the base unit and install the charged batteries into the handset.
- ② Confirm the handset is registered to the base unit ( Y lights).
  If the handset is not registered to the base unit ( Y is flashing), register it. (\*1)
- (3) Lift the handset and press [ > 0] to put the handset in standby mode.
- 4 Press 1, 5, 9 and  $\times$  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.19).

### 8.3.2. Resetting only handset

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



- 1) Install the charged batteries into the handset.
- 2 Lift the handset and press [>0] to put the handset in standby mode.
- 3 Press 3, 5, 7 and # key of the handset simultaneously until a confirmation tone is heard. (\*2)
- (4) Remove the battery.

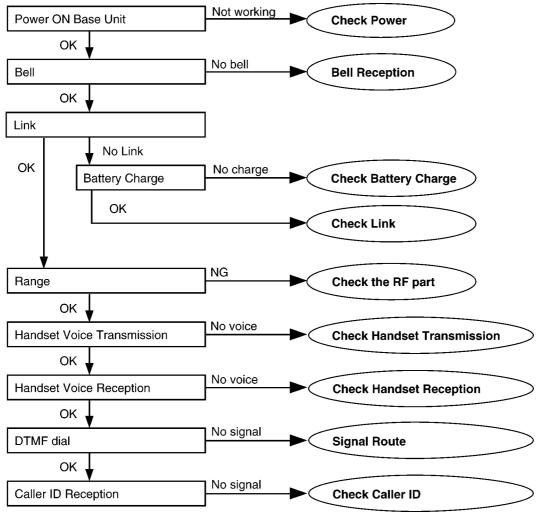
#### Note: (\*2)

- 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.19).
- If users do not bring the base unit with them, the registration procedure has to be done by users themselves.

# 9 Troubleshooting Guide

# 9.1. Troubleshooting Flowchart

#### **Flow Chart**



#### **Cross Reference:**

Check Power (P.33)

**Bell Reception** (P.43)

Check Battery Charge (P.34)

Check Link (P.35)

Check the RF part (P.39)

**Check Handset Transmission** (P.42)

**Check Handset Reception** (P.42)

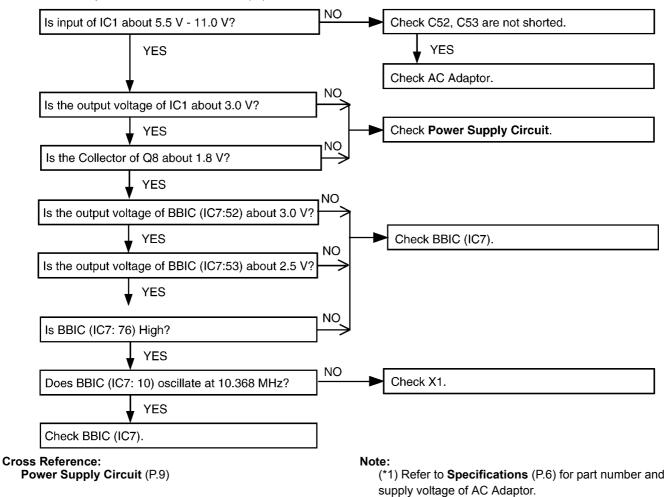
Signal Route (P.14)

Check Caller ID (P.42)

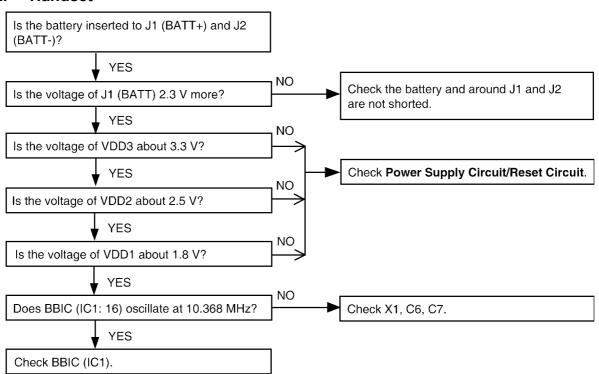
## 9.1.1. Check Power

#### 9.1.1.1. Base Unit

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



#### 9.1.1.2. Handset



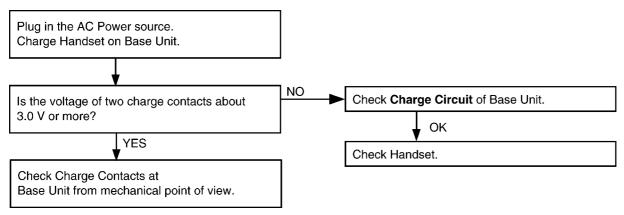
KX-TG7331BX//KX-TGA731BX

#### **Cross Reference:**

Power Supply Circuit/Reset Circuit (P.12)

# 9.1.2. Check Battery Charge

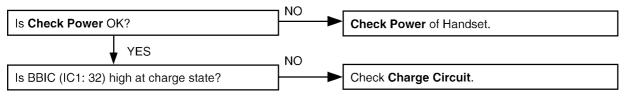
#### 9.1.2.1. Base Unit



#### **Cross Reference:**

Charge Circuit (P.12)

#### 9.1.2.2. Handset

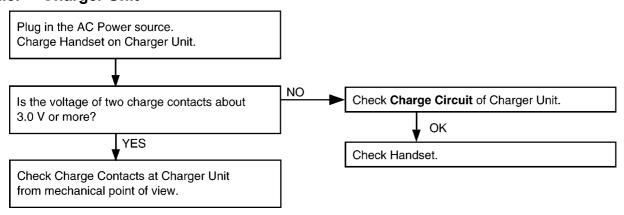


#### **Cross Reference:**

Check Power (P.33)

Charge Circuit (P.12)

# 9.1.2.3. Charger Unit

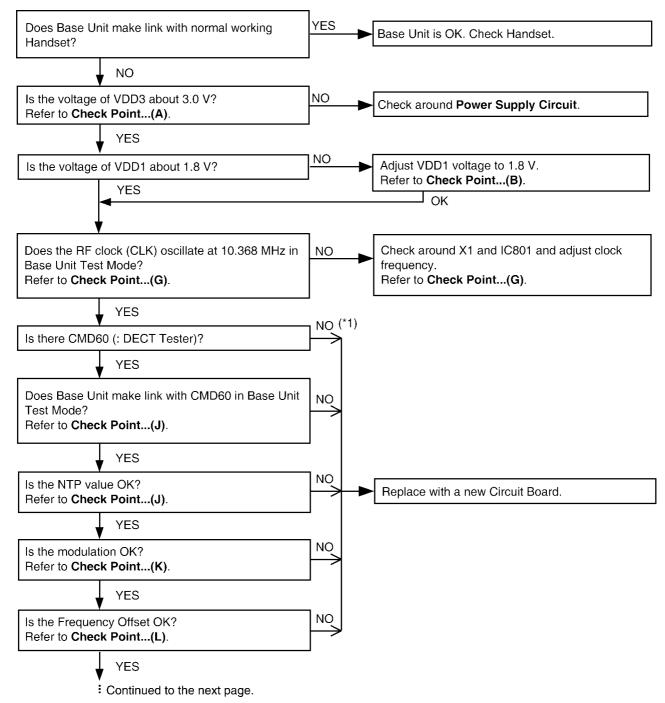


#### **Cross Reference:**

Charge Circuit (P.12)

## 9.1.3. Check Link

#### 9.1.3.1. Base Unit



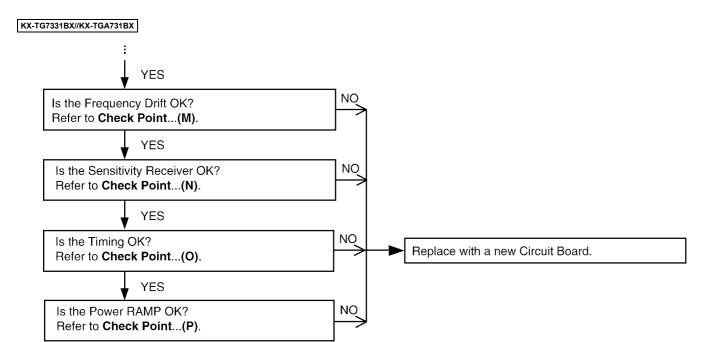
#### Note:

(\*1) Refer to Troubleshooting by Symptom (Base Unit and Charger Unit) (P.44)

#### **Cross Reference:**

Check Point (Base Unit) (P.44)

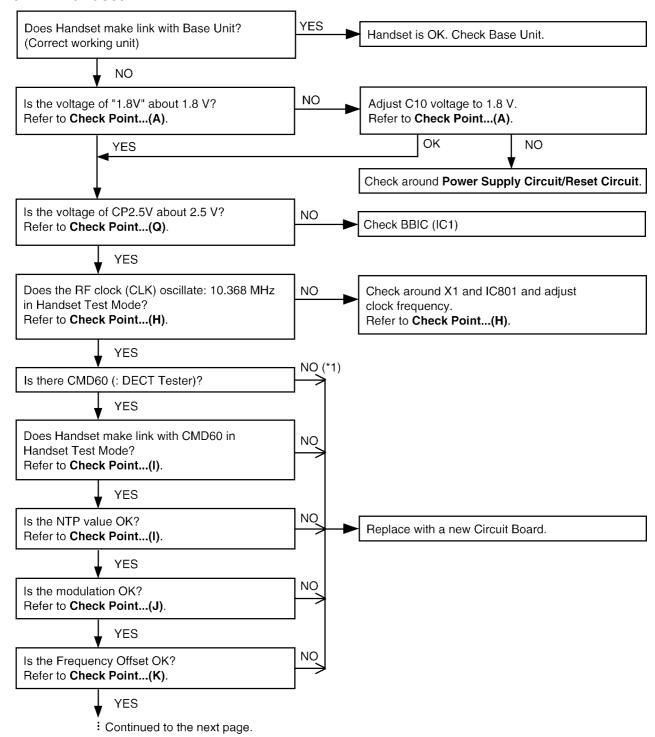
**Power Supply Circuit (P.9)** 



#### **Cross Reference:**

Check Point (Base Unit) (P.44)

#### 9.1.3.2. Handset



#### Note:

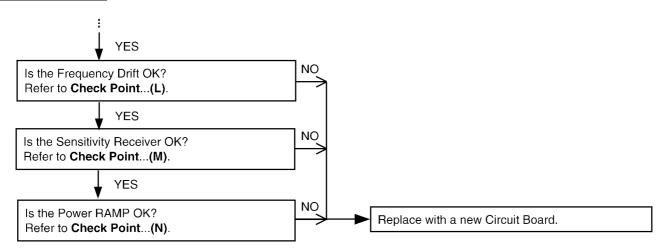
(\*1) Refer to Troubleshooting by Symptom (Handset) (P.48)

**Cross Reference:** 

Check Point (Handset) (P.48)

Power Supply Circuit/Reset Circuit (P.12)

#### KX-TG7331BX//KX-TGA731BX



#### **Cross Reference:**

Check Point (Handset) (P.48)

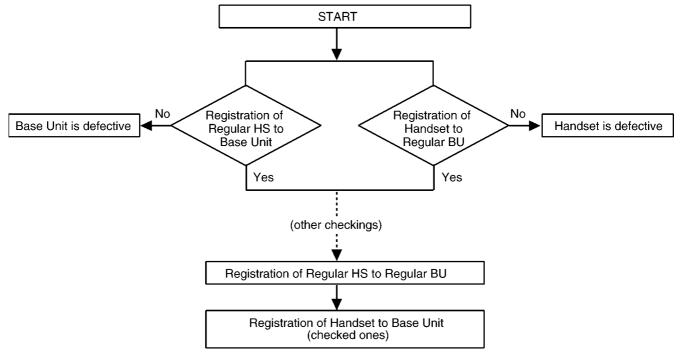
## 9.1.4. Check the RF part

## 9.1.4.1. Finding out the Defective part

- 1. Prepare Regular HS (Handset) and Regular BU (Base unit).
- 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.

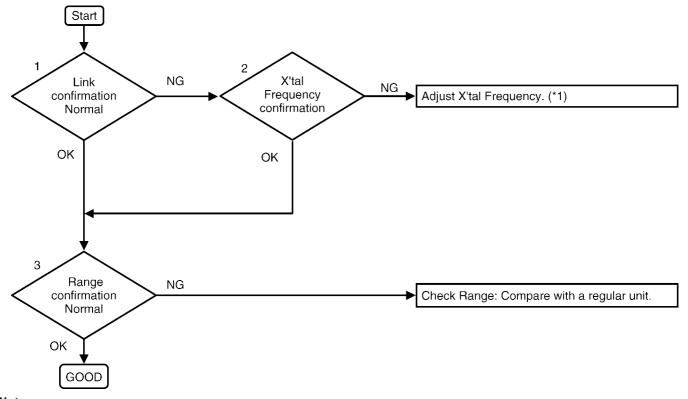


#### Note:

If you need to register a handset, refer to Registering a Handset to the Base Unit (P.19)

### 9.1.4.2. RF Check Flowchart

Each item (1  $\sim$  3) of RF Check Flowchart corresponds to **Check Table for RF part** (P.41). Please refer to the each item.



#### Note:

(\*1) Base unit - refer to (G) of **Check Point (Base Unit)** (P.44) Handset - refer to (H) of **Check Point (Handset)** (P.48)

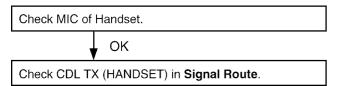
# 9.1.4.3. Check Table for RF part

No.	Item	BU (Base Unit) Check	HS (Handset) Check
1	Link Confirmation Normal	<ol> <li>Register Regular HS to BU (to be checked).</li> </ol>	Register HS (to be checked) to Regular BU.
	HS, BU Mode: [Normal mode]	<ol><li>Press [Talk] key of the Regular HS to establish link.</li></ol>	Press [Talk] key of the HS to establish link.
2	X'tal Frequency confirmation	1. Check X'tal Frequency. (*1) (10.368 MHz ± 100 Hz)	1. Check X'tal Frequency. (*2) (10.368 MHz ±100 Hz)
3	Range Confirmation Normal	<ol> <li>Register Regular HS to BU (to be checked).</li> </ol>	Register HS (to be checked) to Regular BU.
	HS, BU Mode: [Normal mode]	Press [Talk] key of the Regular HS to establish link.     Compare the range of the BU (being)	Press [Talk] key of the HS to establish link.     Compare the range of the HS (being checked) with that of the Regular HS.
		checked) with that of the Regular BU.	,

#### Note:

- (\*1) Refer to Adjustment Standard (Base Unit) (P.59)
- (\*2) Refer to Adjustment Standard (Handset) (P.63)

## 9.1.5. Check Handset Transmission



#### **Cross Reference:**

Signal Route (P.14)

## 9.1.6. Check Handset Reception

Check Handset Speaker in How to check the Handset Speaker or Receiver.

Check CDL RX (HANDSET) in Signal Route.

#### **Cross Reference:**

How to Check the Speaker or Receiver (P.67). Signal Route (P.14)

## 9.1.7. Check Caller ID

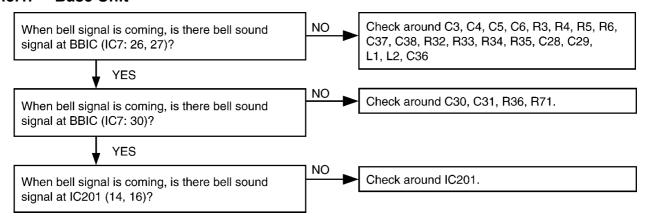
Check Caller ID in Signal Route.

#### **Cross Reference:**

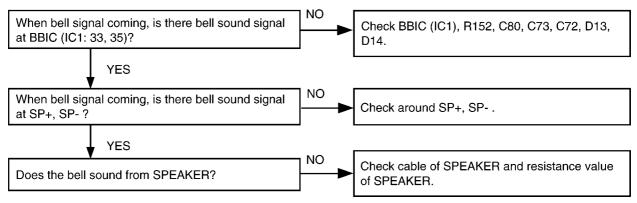
Signal Route (P.14)

## 9.1.8. Bell Reception

#### 9.1.8.1. Base Unit



#### 9.1.8.2. Handset



#### **Cross Reference:**

Telephone Line Interface (P.10)

Check Link (P.35)

How to Check the Speaker or Receiver (P.67)

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

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

	Remedy (*2)			
Symptom	You don't have DECT Tester.	You have DECT Tester. (Model Number : CMD60)		
You cannot dial.	Check item (A)-(I).	Check item (A)-(I), (J)-(P).		
You cannot hear the caller's voice.	Check item (A)-(G).	Check item (A)-(G), (J)-(P), (Q).		
You cannot use handset a little away from base unit even if the handset is within range of the base unit.	-	Check item ( <b>J</b> )-( <b>P</b> ).		
The acoustic transmit level is high or low.	Check item (Q).	Check item (Q).		
The acoustic reception level is high or low.	Check item (Q).	Check item (Q).		
Base unit and handset do not link each other.	Check item (A)-(I).	Check item (A)-(P).		
The unit cannot charge.	Check item (R).	Check item (R).		

#### Note:

- (\*1) A general repair is possible even if you don't have the DECT tester because it is for confirming the levels, such as Acoustic level in detail.
- (\*2) Refer to Check Point (Base Unit) (P.44)

### 9.2.1. Check Point (Base Unit)

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

#### Note:

After the measuring, suck up the solder of TP.

\*: **PC Setting** (P.57) is required beforehand.

The connections of simulator equipments are as shown in Adjustment Standard (Base Unit) (P.59).

Items Check Procedure					
	Items	Point	Procedure	Check or	
(				Replace Parts	
( <b>A</b> )	3.0 V Supply Confirma-	VDD3	1. Confirm that the voltage between test point VDD3 and GND is $3.0 \text{ V} \pm 0.2 \text{ V}$ .	IC1, C50, C51,	
	tion			C52, R50, R51,	
				C53, F1, D1	
( <b>B</b> )	1.8 V Supply Confirma-	VDD1	1. Confirm that the voltage between test point VDD1 and GND is 1.8 V $\pm$ 0.1 V.	Q8, C55, C61,	
	tion			C64, IC7	
(C)	Charge Pump	VDD5	1. Confirm that the voltage between test point VDD5 and GND is 2.5 V -0.1/+0.3	IC7, C404	
, ,	2.5 V Supply Confirma-		V.		
	tion				
( <b>D</b> )	Charge Pump	VDD4	1. Confirm that the voltage between test point VDD4 and GND is 3.0 V ± 0.2 V.	IC7, C422, C425	
( )	3.0 V Supply Confirma-			, , , , , , , , , , , , , , , , , , , ,	
	tion				
(E)*	BBIC Confirmation		BBIC Confirmation (Execute the command "getchk").	IC7, X1, R76,	
(-)	22.0 00		Confirm the returned checksum value.	R69, R70	
			Connection of checksum value and program number is shown below.		
			checksum value program number		
			ex.) F0F1 DB11ZA		
( <b>F</b> )*	EEPROM Confirmation	-	<ol> <li>EEP-ROM Confirmation (Execute the command "ChkTG7330XXrevYY.bat").</li> </ol>	IC7, RA401,	
			XX: country code	C401, R405,	
			YY: revision number	IC401	
			Confirm the returned checksum value.		
			3. The checksum is displayed in the last output line.		
			Note:		
			"XX", "YY", and "checksum" vary depending on the country version. You can find		
			them in the batch file, PQZZ- mentioned in <b>JIG and PC</b> (P.57).		
( <b>G</b> )*	BBIC Clock Adjustment	CLK	1. Input Command " sendchar WWD ff 48 IC 8006"	X1, IC7, C66	
(-)		VDD4	Confirm that the voltage between testpoint VDD4 and GND is less than 1.0 V.	.,,	
			3. Input Command " sendchar sfr", then you can confirm the current value.		
			4. Check X'tal Frequency. (10.368 MHz ± 100 Hz).		
			5. If the frequency is not 10.368MHz ± 100Hz, adjust the frequency of CLK exe-		
			cuting the command "sendchar sfr xx xx (where xx is the value)" so that the		
			reading of the frequency counter is 10.368000 MHz ± 5 Hz.		
			reading of the frequency counter is 10.300000 MHZ ± 3 HZ.		

	It a see	Ola a alla	December	Observe
	Items	Check Point	Procedure	Check or Replace Parts
(H)*	Hookswitch Check with	-	1. Connect Telephone Socket to Tel-simulator which is connected with 600 $\Omega$ .	L1, L2, Q3, R14,
` ′	DC Characteristics		2. Set line voltage to 48 V and line current to 40mA at off-hook condition of nor-	R15, Q4, R16,
			mal telephone.	R17, D3,
			3. Execute the command "hookoff"	R18~R24,
			4. Confirm that the line current is 40 mA ± 5 mA.	C15~C17, D21,
			5. Execute the command "hookon".	Q5, R27, IC7
			6. Confirm that the line current is less than + 0.8 mA.	Q0, 1127, 107
(I)	DTMF Generator Check	_	Connect Telephone Socket to DTMF tester. (Load=600 Ω)	IC7, R25, C21,
(1)	BTWI Generator Greek	_	Link Handset and push dial key.	R29, C22, C23,
			Confirm DTMF character.	D21
			4. Confirm that the high Group is -6 ± 2 dBm.	DZI
			5. Confirm that the low Group is -8 ± 2 dBm.	
/ <b> </b> \*	Transmitted Power Con-		Remove the Antenna before starting step from 1 to 7.	IC7, L104,
(J)*		- ANTI_TP	- ·	
	firmation	ANTI_TP	Configure the DECT tester (CMD60) as follows;  Outlines	C101, C106,
			<setting></setting>	C102, C109,
			• Test mode: FP	R65, R66, DA1,
			• Traffic Carrier: 5	R802~R807,
			• Traffic Slot: 4	C837, C826,
			Mode: Loopback	C822, C820,
			• PMID: 00000	C832, C833,
			• RF LEVEL = -70 dBm.	C63, Q401,
			Execute the command "sendchar TST".	C402, C105,
			3. Execute the command "sendchar dmv 2 2".	C110, C65,
			4. Check that "Signalling Status" has been set to "Locked", then press "ACCEPT	
			RFPI".	D802,
			5. Initiate connection from Dect tester ("set up connect")	C801~C804,
			6. Execute the command "ANT1".	C808~C814,
			7. Confirm that the NTP value at ANT is 19.0 dBm ~ 25.0 dBm.	L802~L804,
				C819, C834,
				C825
( <b>K</b> )*	Modulation Check and	-	Follow steps 1 to 6 of (J).	IC7, L104,
	Adjustment	ANTI_TP	7.Confirm that the B-Field Modulation is -370 ± 30/ +370± 30 kHz/div & Modu-	C101, C106,
			lated width ≥ 690 kHz using data type Fig31.	C102, C109,
			8.Adjust the B-Field Modulation if required. (Execute the command "readmod"	R65, R66, DA1,
			and "wrtmod xx", where xx is the value.)	R802~R807,
				C837, C826,
				C822, C820,
				C832, C833,
				C63, Q401,
				C402, C105,
				C110, C65,
				IC801, D801,
				D802,
				C801~C804,
				C808~C814,
				L802~L804,
				C819, C834,
				C825
(L)*	Frequency Offset Check	-	Follow steps 1 to 6 of (J).	IC7, L104,
` ′	, ,	ANTI_TP	7.Confirm that the frequency offset is < ± 10 kHz.	C101, C106,
		_		C102, C109,
				R65, R66, DA1,
				R802~R807,
				C837, C826,
				C822, C820,
				C832, C833,
				C63, Q401,
				C402, C105,
				C110, C65,
				IC801, D801,
				D802,
				C801~C804,
				C808~C814,
				L802~L804,
				C819, C834,
				C825

### KX-TG7331BX//KX-TGA731BX

	Items	Check	Procedure	Check or
		Point		Replace Parts
( <b>M</b> )*	Frequency Drift Confir-	-	Follow steps 1 to 6 of (J).	IC7, L104,
	mation	ANTI_TP	7.Confirm that the frequency drift is < ± 20 kHz/ms.	C101, C106,
				C102, C109,
				R65, R66, DA1,
				R802~R807,
				C837, C826,
				C822, C820,
				C832, C833,
				C63, Q401,
				C402, C105,
				C110, C65,
				IC801, D801,
				D802,
				C801~C804,
				C808~C814,
				L802~L804,
				C819, C834,
(A I) ±	0 ''' '' D '			C825
( <b>N</b> )*	Sensitivity Receiver	- ANT! TD	Follow steps 1 to 6 of (J).	IC7, L104,
	Confirmation	ANTI_TP	7.Set DECT tester power to -90 dBm.	C101, C106,
			8.Confirm that the BER is < 1000 ppm.	C102, C109,
				R65, R66, DA1,
				R802~R807,
				C837, C826, C822, C820,
				C832, C833,
				C63, Q401,
				C402, C105,
				C110, C65,
				IC801, D801,
				D802,
				C801~C804,
				C808~C814,
				L802~L804,
				C819, C834,
				C825
<b>(O</b> )*	Timing Confirmation	-	Follow steps 1 to 6 of (J).	IC7, L104,
, ,	•	ANTI_TP	7.Confirm that the Timing accuracy is	C101, C106,
			• ± 5.0 ppm (When adjust the frequency of CLK in item (G)).	C102, C109,
			• ± 15 ppm (When do not adjust the frequency of CLK in item (A)).	R65, R66, DA1,
				R802~R807,
				C837, C826,
				C822, C820,
				C832, C833,
				C63, Q401,
				C402, C105,
				C110, C65,
				IC801, D801,
				D802,
				C801~C804, C808~C814,
				L802~L804,
				C819, C834,
				C825
<u></u>				0020

	Items	Check	Procedure	Check or
		Point		Replace Parts
( <b>P</b> )*	Power RAMP Confirma-	-	Follow steps 1 to 6 of (J).	IC7, L104,
	tion		7.Confirm that Power RAMP is matching.	C101, C106,
				C102, C109,
				R65, R66, DA1,
				R802~R807,
				C837, C826,
				C822, C820,
				C832, C833,
				C63, Q401,
				C402, C105,
				C110, C65,
				IC801, D801,
				D802,
				C801~C804,
				C808~C814,
				L802~L804,
				C819, C834,
				C825
( <b>Q</b> )	Audio Check	-	1. Link with Handset.	IC7, SA1, L1,
			2. Input -45dBm/1kHz to MIC of Handset.	L2, D3, Q3, Q4,
			Measure the Level at Line I/F and distortion level.	R14, R15, R16,
			3. Confirm that the level is -8.5 dBm $\pm$ 2 dBm and that the distortion level is < 5%	R17
			at TEL Line (600 $\Omega$ Load).	
			4. Input -20 dBm/1 kHz to Line I/F.	
			Measure the level at Receiver of Handset and distortion level	
			(*Receive volume set to second position from minimum).	
			5. Confirm that the level is -22 dBm $\pm$ 2 dBm and that the distortion level is < 5%	
			at Receiver (Volume Middle, 150 $\Omega$ Load).	
( <b>R</b> )	Charging Check	-	1. Connect Charge Contact 12 $\Omega/2$ W resistor between charge+ and charge	R56, R57, D22,
			2. Measure and confirm voltage across the resistor is 2.75 V $\pm$ 0.3 V.	D23

# 9.2.2. Check Point (Charger Unit)

	Items	Check	Procedure	Check or
		Point		Replace Parts
( <b>A</b> )	Charging Check	-	<ol> <li>Connect Charge Contact 10 Ω/2 W resistor between charge+ and charge</li> </ol>	R1
			2. Measure and confirm voltage across the resistor is 2.75 V $\pm$ 0.3 V.	D1, F1

#### Note:

After the measuring, suck up the solder of TP.

The connection of adjustment equipment is as shown in Adjustment Standard (Charger Unit) (P.60).

# 9.3. Troubleshooting by Symptom (Handset)

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

	Remedy (*2)		
Symptom	You don't have DECT Tester.	You have DECT Tester. (Model Number : CMD60)	
Battery strength is not indicated correctly by Battery icon.	Check item (A)-(B), (E)-(F).	Check item (A)-(B), (F)-(G).	
You cannot hear the caller's voice.	Check item (A)-(B), (H).	Check item (A)-(B), (H)-(K), (L).	
You cannot use handset a little away from base unit even if the handset is within range of the base unit.	-	Check item (I), (M).	
Does not link between base unit and handset.	Check item (A)-(B), (H).	Check item (A)-(B), (H)-(M).	
The Audio level is high or low.	Check item (O).	Check item ( <b>O</b> ).	
The SP-Phone level is high or low.	Check item (P).	Check item (P).	

#### Note:

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

(\*2) Refer to Check Point (Handset) (P.48)

### 9.3.1. Check Point (Handset)

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

#### Note:

After the measuring, suck up the solder of TP.

\*: PC Setting (P.61) is required beforehand.

The connections of adjustment equipments are as shown in Adjustment Standard (Handset) (P.63).

	Items	Check		Proced	lure		Check or
		Point					Replace Parts
( <b>A</b> )*	1.8 V Supply Adjustment	VDD1	Confirm that the vo				IC1, Q2, C48, D1, C1, C44,
			Execute the comm     Adjust the 1.8V vi				
			value).	ollage of VDD1 ex	decuting command v		C40, C45, F1,
			value).				L8
(B)*	BBIC Confirmation	-	BBIC Confirmation	BBIC Confirmation (Execute the command "getchk").			IC1, X1, RA61,
			<ol><li>Confirm the returned</li></ol>	Confirm the returned checksum value.			R64, R66
			Connection of checksum value and program number is shown below.				
				checksum value	program number		
			ex.)	C4AF	DAY2BA		
	EEP-ROM Confirmation	-	XX: country code YY: revision number 2. Confirm the returner Note: "XX", "YY", and "check them in the batch file.	YY: revision number 2. Confirm the returned checksum value.			
(D)	Charge Control Check & Charge Current Monitor Check	-	1. Apply 3.5 V betwe rent limit to 250 m/ Confirm the indicat 2. Confirm that the cu	A. ion of "charging" or	LCD.	., ,	IC1, Q4 Q9, D7, D8, L4, L5, R6, R7, F1, C1, C3, R2,
						WOFF.	R30, R31, R8,
			Confirm it after waiting over 1 minute at least.  3. Decrease current limit of DC power supply to 100 mA.			C147, R45,	
				4. Confirm that the current limit LED of DC power supply is stable. (Current limiter			
			(If charge control cannot set power supply and try	,	s procedure, please ι	use battery to hand-	

	Items	Check Point	Procedure	Check or
/E\	Charge Detection (OFF)	POIIIL	1. Step symphotics 2. E.\/ to CLIC (1) and CLIC ()	Replace Parts
(E)	` '	-	1. Stop supplying 3.5 V to CHG (+) and CHG (-).	IC1, Q4 Q9,
	Check		Confirm the indication of "charging" has been cleared.	D7, D8, L4, L5,
				R6, R7, F1,
				C1, C3, R2,
				R30, R31, R8,
				C147, R45,
				C15, L8
<b>(F</b> )*	Battery Monitor Check	-	1. Apply 2.25 V between BATT+ and BATT	IC1, F1, C1
			Execute the command	C3, R12, R45
			sendchar PAD	
			sendchar LED 0	
			sendchar CRX 0 1	
			sendchar AD1	
			It assumes that the return value 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 = 0004(Low Voltage) write "YY"	
			Execute the command "wreeprom 00 04 01 YY".	
			EEPROM = 0005(No Voltage) write "YY - 1D"	
			` ,	
			Execute the command "×wreeprom 00 05 01 ZZ".	
			EEPROM = 000A(Low Voltage BL) write "YY - 16"	
			Execute the command "wreeprom 00 0A 01 WW".	
			Note: ZZ = YY - C	
			No Voltage writing data limit is '00'.	
			c) XX: 00 ~ 69: Reject	
(C)	Datta m. Lavy Carafirma		XX: 75 ~ FF: Reject	104 54 04
( <b>G</b> )	Battery Low Confirma-	-	Apply 2.40 V between BATT+ and BATT     Confirm that there is no flooring of Battery lean.	IC1, F1, C1
	tion		2. Confirm that there is no flashing of Battery Icon.	C3, R12, R45
			3. Apply 2.25 V ± 0.08 V between BATT+ and BATT	
/11\*	DDIC Clarels Adissature and	CLIK	4. Confirm that there is flashing of Battery Icon.	104 V4 C47
( <b>H</b> )"	BBIC Clock Adjustment	CLK	1. Apply 2.6 V between BATT+ and BATT- with DC power.	IC1, X1, C47
			2. Input Command "sendchar sfr", then you can confirm the current value.	
			3. Check X'tal Frequency. (10.368 MHz ± 100 Hz).	
			4. If the frequency is not 10.368 MHz ± 100 Hz, adjust the frequency of CLK exe-	
			cuting the command "sendchar sfr xx xx (where xx is the value)" so that the	
			reading of the frequency counter is 10.368000 MHz ± 5 Hz.	
			Note:	
			Clear the registered information for Base Unit before measurement, because The	
			Frequency will not possibly get stable due to the registered information.	
			Pressing the button of "3" "7" "9" "#" clears the registration.	
/*\*	Towns with a 1 D		Register to it on Base Unit after measurement.	104
(I)*	Transmitted Power Con-	-	Remove the Antenna before starting step from 1 to 4.	IC1,
	firmation		Configure the DECT tester (CMD60) as follows;  Continues:	C808~C814,
			<setting></setting>	L802~L804,
			• Test mode: PP	C825, C834,
			• RFPI: 0102030405	C819, IC801,
			• Traffic Carrier: 5	R107, R108,
			• Traffic Slot: 4	C117, C118,
			Mode: Loopback     To ID	C841, C125,
			• RF LEVEL = -70 dBm	C842, DA1,
			• PACKET: PP32Z	C801~C804,
			2. Execute the command "sendchar TST 01 02 03 04 05".	D801,D802,
			3. Initiate connection from DECT tester.	C837, C826,
			4. Confirm that the NTP value at ANT is 19 dBm ~ 25 dBm.	C822, C820,
				C832, C833,
				R801~R807

### KX-TG7331BX//KX-TGA731BX

	Items	Check	Procedure	Check or
		Point		Replace Parts
( <b>J</b> )*	Modulation Check and	-	Follow steps 1 to 3 of (I).	IC1,
	Adjustment		4.Confirm that the B-Field Modulation is -370±30/ +370±30 kHz/div & Modulated	C808~C814,
			width ≥ 690 kHz using data type Fig 31.	L802~L804,
				C825, C834,
				C819, IC801,
				R107, R108,
				C117, C118,
				C841, C125,
				C842, DA1,
				C801~C804,
				D801,D802,
				C837, C826,
				C822, C820,
				C832, C833,
				R801~R807
( <b>K</b> )*	Frequency Offset Confir-	-	Follow steps 1 to 3 of (I).	IC1,
	mation		4.Confirm that the frequency Offset is < ± 10 kHz.	C808~C814,
				L802~L804,
				C825, C834,
				C819, IC801,
				R107, R108,
				C117, C118,
				C841, C125,
				C842, DA1,
				C801~C804,
				D801,D802,
				C837, C826,
				C822, C820, C832, C833,
				R801~R807
(L)*	Frequency Drift Confir-	_	Follow steps 1 to 3 of (I).	IC1,
(-)	mation	_	4.Confirm that the frequency Drift is < ± 20 kHz/ms.	C808~C814,
	maton		1. Sommit that the frequency Britis 12 20 Million.	L802~L804,
				C825, C834,
				C819, IC801,
				R107, R108,
				C117, C118,
				C841, C125,
				C842, DA1,
				C801~C804,
				D801,D802,
				C837, C826,
				C822, C820,
				C832, C833,
				R801~R807
( <b>M</b> )*	Sensitivity Receiver	-	Follow steps 1 to 3 of (I).	IC1,
	Confirmation		4.Set DECT tester power to -88 dBm.	C808~C814,
			5.Confirm that the BER is < 1000 ppm.	L802~L804,
				C825, C834,
				C819, IC801,
				R107, R108,
				C117, C118,
				C841, C125,
				C842, DA1,
				C801~C804,
				D801,D802,
				C837, C826,
				C822, C820,
				C832, C833,
				R801~R807

	Items	Check	Procedure	Check or
		Point		Replace Parts
(N)*	Power RAMP Confirma-	-	Follow steps 1 to 3 of (I).	IC1,
	tion		4.Confirm that Power RAMP is matching.	C808~C814,
				L802~L804,
				C825, C834,
				C819, IC801,
				R107, R108,
				C117, C118,
				C841, C125,
				C842, DA1,
				C801~C804,
				D801,D802,
				C837, C826,
				C822, C820,
				C832, C833,
				R801~R807
<b>(O</b> )	Audio Check and Confir-	-	Link to BASE which is connected to Line Simulator.	IC1, R23, C12,
	mation		2. Set line voltage to 48 V and line current to 40 mA.	D19, D20,
			3. Input -45 dBm/1KHz to MIC and measure Line output level.	C96, C97,
			4. Confirm that the level is -8.5 dBm $\pm$ 2 dBm and that the distortion level is < 5%	R215, R27,
			at TEL Line (600 $\Omega$ Load).	RA4, C11,
			5. Input -20 dBm/1KHz to Line I/F and measure Receiving level at REV+ and	C13, R28, D3,
			REV	D4, L10, L11,
			6. Confirm that the level is -22 dBm ± 2 dBm and that the distortion level is < 5% at Receiver. (vol = 2)	MIC
( <b>P</b> )	SP phone Audio Check	-	Link to Base which is connected to Line Simulator.	IC1, R23, C12,
	and Confirmation		2. Set line voltage to 48 V and line current to 40 mA.	C73, D13,
			Set the handset off-hook using SP-Phone key.	D14, R152,
			4. Input -25 dBm/1KHz to Line I/F and measure Receiving level at SP+ and SP	C80, L10, L11,
			5. Confirm that the level is -14 dBm $\pm$ 2 dBm and that the distortion level is < 5%.	MIC, C11,
			(vol = 3)	C13, RA4,
				R27, R28,
				C96, C97,
				R215, C72
( <b>Q</b> )	Charge Pump 2.5V Sup-	CP2.5V	1. Confirm that the voltage between testpoint CP2.5V and GND is 2.5V -0.1/	C52, C53, C49
	ply Confirmation		+0.3V.	

## 9.3.2. Troubleshooting for Speakerphone

When the customer's telephone line corresponds to the following conditions, and the transmission signal of SP-Phone is interrupted, performing the next set up to a cordless handset will improve it to some extent.

#### **Conditions**

- 1. When customer's line has less line loss.
  - ex.) The customer is using optical fiber, ISDN terminal adaptor, or PBX.
  - In this case, receiving signal is strong and it may affect transmission signal.
- 2. When the other party is talking from noisy place.
  - ex.) The other party is using cellular phone. The background noise is very loud.
  - In this case, the noise from the other party (i.e. surrounding noise) may affect transmission signal.

### **Setting Method**

• Change the handset address of EEPROM (0129) from 00 to 01 by **Engineering Mode**.

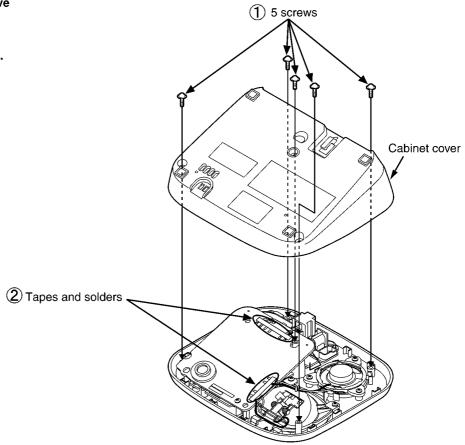
# 10 Disassembly and Assembly Instructions

# 10.1. Disassembly Instructions

### 10.1.1. Base Unit

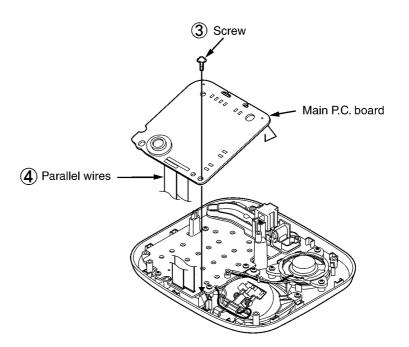
(1) Remove the 5 screws to remove the cabinet cover.

(2) Remove the tapes and solders.

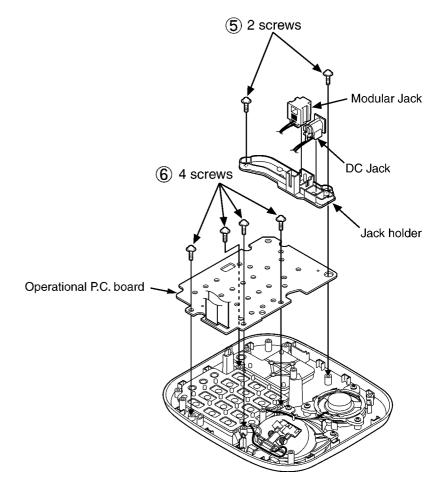


(3) Remove the screw .

(4) Remove the parallel wires to remove the main P.C. board.

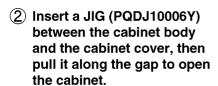


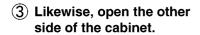
- (5) Remove the 2 screws to remove the jack holder.
- Remove the 4 screws to remove the operational P.C. board.

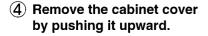


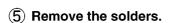
### 10.1.2. Handset

(1) Remove the 2 screws.

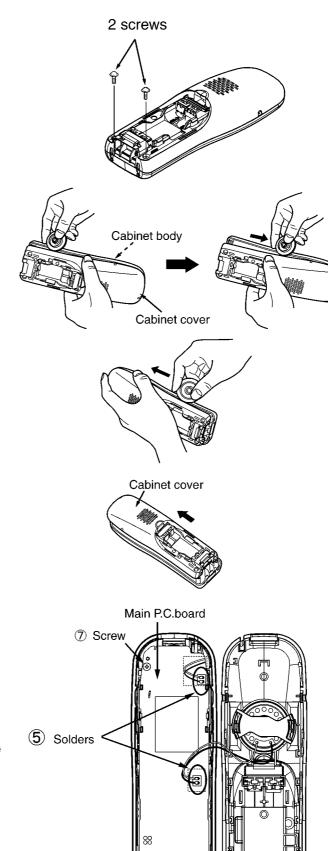








- 6 Remove the 2 screws to remove the 2 charge terminals.
- (7) Remove the screw to remove the main P. C. board.

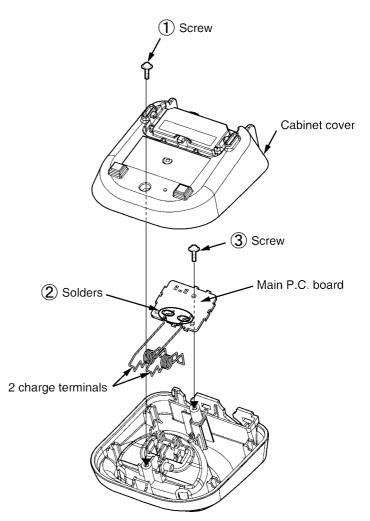


6 2 screws

6 2 charge terminals

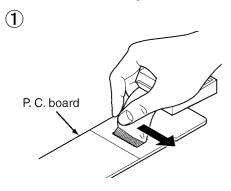
# 10.1.3. Charger Unit

1 Remove the screw to remove the cabinet cover.



- 2 Remove the solders to remove the 2 charge terminals.
- (3) Remove the screw to remove the main P.C. board.

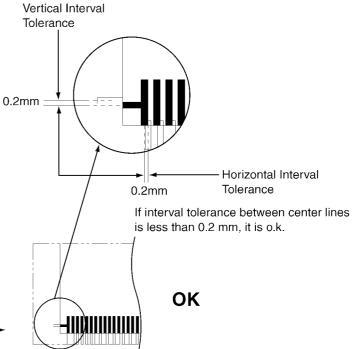
# 10.2. How to Replace the Handset LCD

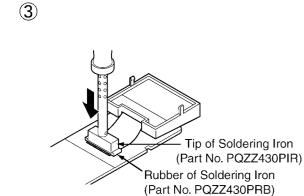


Peel off the FFC (Flexible Flat Cable) from the LCD, in the direction of the arrow. Take care to ensure that the foil on the P.C. board is not damaged.

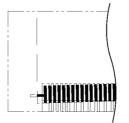
2 New LCD

Fit the heatseal of a new LCD.

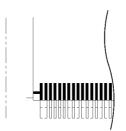




Heatweld with the tip of the soldering iron about 5 to 8 seconds (in case of 60W soldering iron).



NG (Inclined)



NG

(Vertical interval tolerance is more than 0.2 mm.)



NG

(Horizontal interval tolerance is more than 0.2 mm.)

# 11 Measurements and Adjustments

## 11.1. The Setting Method of JIG (Base Unit)

## 11.1.1. Preparation

### 11.1.1.1. Equipment Required

- DECT tester: Rohde & Schwarz, CMD 60 is recommended.
- Frequency counter: It must be precise enough to measure intervals of 1 Hz (precision; ±4 ppm). Hewlett Packard, 53131A is recommended.
- Digital multi-meter (DMM): it must be able to measure voltage and current.
- Oscilloscope

#### 11.1.1.2. JIG and PC

Serial JIG

JIG Cable: PQZZ1CD300E\*
• PC which runs in DOS mode

• Batch file CD-ROM for setting: PQZZTG7331BX

#### Note:

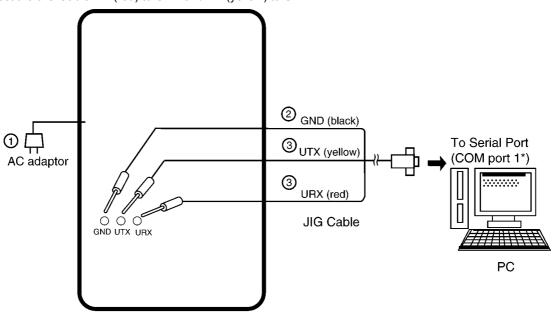
\*: If you have the JIG Cable for TCD500 series (PQZZ1CD505E), change the following values of resistance. Then you can use it as a JIG Cable for both TCD300 and TCD500 series. (It is an upper compatible JIG Cable.)

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

### 11.1.2. PC Setting

#### 11.1.2.1. Connections

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



Base unit P. C. board

#### Note:

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

#### 11.1.2.2. Batch file Setting

- 1. Insert the Batch file CD-ROM into CD-ROM drive and copy PQZZTG\*\*\*\* 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 ¥PQZZTG\*\*\*\*", 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: correct setting>
- C: ¥Documents and Settings>D:
- D: ¥>CD ¥PQZZTG\*\*\*\*
- D: ¥PQZZTG\*\*\*\* >SET\_COM=X
- D: ¥PQZZTG\*\*\*\*>READID
- 00 52 4F A8 A8
- D: ¥PQZZTG\*\*\*\*>DOSKEY
- D: ¥PQZZTG\*\*\*\*>\_

#### <Example: incorrect setting>

- C: ¥Documents and Settings>D:
- D: ¥>CD ¥PQZZTG\*\*\*\*
- D: ¥PQZZTG\*\*\*\* >SET\_COM=X
- D: ¥PQZZTG\*\*\*\*>READID CreateFile error

ERROR 10: Can't open serial port

D: ¥PQZZTG \*\*\*\*>\_

#### Note:

• "\*\*\*" varies depending on the country.

#### 11.1.2.3. Commands

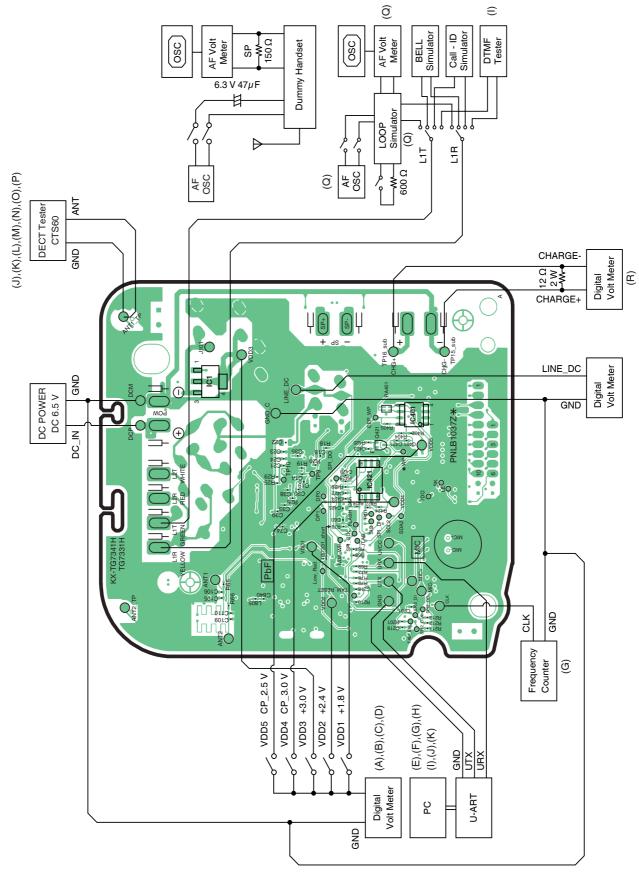
See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of EEPROM	Type "rdeeprom 00 00 FF", and the data from address "00 00" to "FF" is read out.
readid	Read ID (RFPI)	Type "readid", and the registered ID is read out.
writeid	Write ID (RFPI)	Type "writeid 00 18 E0 0E 98", and the ID "0018 E0 0E 98" is written.
hookoff	Off-hook mode on Base	Type "hookoff".
hookon	On-hook mode on Base	Type "hookon".
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.

## 11.2. Adjustment Standard (Base Unit)

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

### 11.2.1. Bottom View



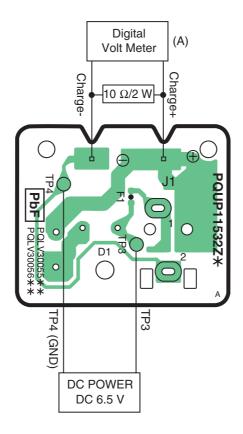
Note:

(A) - (R) is referred to Check Point (Base Unit) (P.44)

# 11.3. Adjustment Standard (Charger Unit)

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

## 11.3.1. Bottom View



#### Note:

(A) is referred to Check Point (Charger Unit) (P.47)

## 11.4. The Setting Method of JIG (Handset)

#### 11.4.1. Preparation

### 11.4.1.1. Equipment Required

- DECT tester: Rohde & Schwarz, CMD 60 is recommended.
- Frequency counter: It must be precise enough to measure intervals of 1 Hz (precision; ±4 ppm). Hewlett Packard, 53131A is recommended.
- DC power: it must be able to output at least 1 A current under 2.4 V for Handset.
- Digital multi-meter (DMM): it must be able to measure voltage and current.
- Oscilloscope

#### 11.4.1.2. JIG and PC

Serial JIG

JIG Cable: PQZZ1CD300E\*

- PC which runs in DOS mode.
- Batch file CD-ROM for setting: PQZZTG7331BX

#### Note:

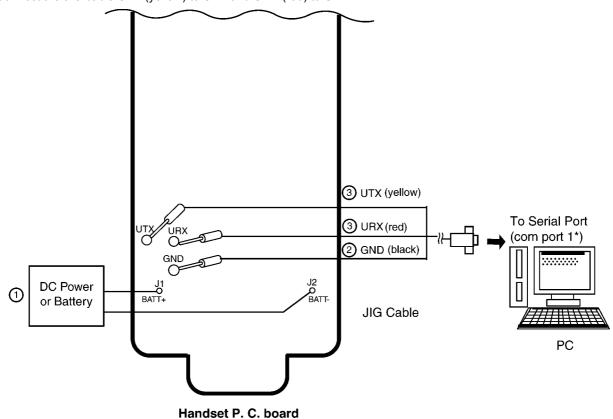
\*: If you have the JIG Cable for TCD500 series (PQZZ1CD505E), change the following values of resistance. Then you can use it as a JIG Cable for both TCD300 and TCD500 series. (It is an upper compatible JIG Cable.)

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

### 11.4.2. PC Setting

#### 11.4.2.1. Connections

- ①Connect the DC Power or Battery to BATT+ and BATT-.
- ②Connect 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.

#### 11.4.2.2. Batch file Setting

- 1. Insert the Batch file CD-ROM into CD-ROM drive and copy PQZZTG\*\*\*\*\* 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),

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 \(\forall \text{PQZZTG\*\*\*\*\*"}\), then press the **Enter** key.
- **5.** Type "SET RTX\_COM=X", then press the Enter key (X: COM port number used for the serial connection on your PC).
- **6.** Type "READID", then press the Enter key.
  - •If any error messages appear, change the port number or check the cable connection.
  - •If any value appear, go to next step.
- **7.** Type "DOSKEY", then press the Enter key.

- <Example: correct setting>
- C: ¥Documents and Settings>D:
- D: ¥>CD ¥PQZZTG\*\*\*\*\*
- D: ¥PQZZTG\*\*\*\* >SET RTX\_COM=X
- D: ¥PQZZTG\*\*\*\*\*>READID
- 00 52 4F A8 A8
- D: ¥PQZZTG\*\*\*\*\*>DOSKEY
- D: ¥PQZZTG\*\*\*\*\*> \_
  - <Example: incorrect setting>
- C: ¥Documents and Settings>D:
- D: ¥>CD ¥PQZZTG\*\*\*\*\*
- D: ¥PQZZTG\*\*\*\*\* >SET RTX COM=X
- D: \pmy PQZZTG\*\*\*\*\*>READID
  CreateFile error

ERROR 10: Can't open serial port

D: ¥PQZZTG\*\*\*\*\*> \_

#### Note:

• "\*\*\*\*" varies depending on the country.

#### 11.4.2.3. Commands

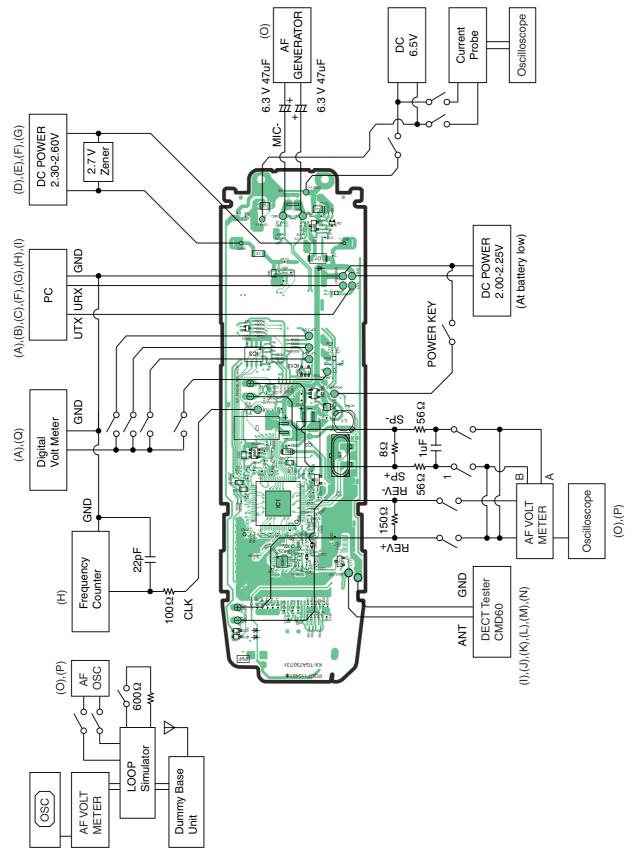
See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of EEPROM	Type "rdeeprom 00 00 FF", and the data from address "00 00" to "FF" is read out.
readid	Read ID (RFPI)	Type "readid", and the registered ID is read out.
writeid	Write ID (RFPI)	Type "writeid 00 18 E0 0E 98", and the ID "0018 E0 0E 98" is written.
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.

## 11.5. Adjustment Standard (Handset)

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

## 11.5.1. Component View



Note:

(A) - (Q) is referred to Check Point (Handset) (P.48)

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

#### Cautions:

Some of the content on this page may not apply to models from some countries.

#### 11.6.1. Base Unit

Before making the following adjustment, ensure you have carried out PC Setting (P.57) in The Setting Method of JIG (Base Unit).

	Items	Necessary Adjustment	
BBIC (IC7)	Programs for Voice processing, interface for RF and EEPROM	<ol> <li>Connect the DC Power</li> <li>Connect the JIG cable, and execute the command "getchk", then confirm the checksum value is correct.</li> <li>Default batch file: Execute the command "default.bat".</li> <li>Country version batch file: Execute the command "TG7330XXrevYY.bat". (*1)</li> <li>Clock adjustment: Refer to Check Point (G). (*2)</li> </ol>	
EEPROM (IC401)	Adjustment parameter data (country version batch file, default batch file, etc.)	<ul><li>3. Country version batch file: Execute the command "TG7330XXrevYY.bat". (*1)</li><li>4. Clock adjustment: Refer to Check Point (F). (*2)</li></ul>	
X'tal (X1)	System clock	1. Refer to Check Point (F). (*2)	

#### Note:

(\*1) XX: country code, YY: revision number, ZZ: Voice Prompt

"XX", "YY" and "ZZ" vary depending on the country version. You can find them in the batch file, PQZZ- mentioned in **JIG and PC** (P.57).

(\*2) Refer to Check Point (Base Unit) (P.44)

### 11.6.2. Handset

Before making the following adjustment, ensure you have carried out PC Setting (P.61) in The Setting Method of JIG (Handset).

	Items	Necessary Adjustment	
BBIC (FLASH type)	Programs for Voice processing, interface for RF	1. Make sure to connect the JIG cable, then detach the DC	
(IC1)	and EEPROM	Power.	
		2. Execute the command "flw480 *******.hex".	
		Connect the DC Power.	
		Press and hold the handset Power key.	
		<ol><li>While holding down the handset Power key, press the PC Enter key once.</li></ol>	
		<ol><li>After a few minutes, "Successful upgrade" is displayed on the PC indicating downloading has finished.</li></ol>	
		<ol><li>Detach the JIG cable, then press the handset Power key to turn it on.</li></ol>	
		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.	
		Default batch file: Execute the command "default.bat".	
		<ol> <li>Default batch file (remaining): Execute the Command "TGA731DEFrevYY.bat". (*3).</li> </ol>	
		11. Country version batch file: Execute the command	
		"TGA731XXrevYY.bat". (*3).	
		12. Clock adjustment: Refer to Check Point (H). (*4).	
		13. 1.8 V setting and battery low detection: Refer to Check	
		Point (A), (F) and (G). (*4).	
EEPROM (IC3)	Adjustment parameter data	Default batch file: Execute the command "default.bat".	
	(country version batch file, default batch file,	Default batch file (remaining): Execute the Command	
	etc.)	"TGA731DEFrevYY.bat". (*3)	
		Country version batch file: Execute the command	
		"TGA731XXrevYY.bat". (*3)	
		4. Clock adjustment: Refer to Check Point (J). (*4)	
		5. 1.8 V setting and battery low detection: Refer to Check	
		Point (A), (F) and (G). (*4)	
X'tal (X1)	System clock	1. Refer to Check Point (H). (*4)	

#### Note:

- (\*3) XX: country code, YY: revision number
- "XX" and "YY" vary depending on the country version. You can find them in the batch file, PQZZ- mentioned in **JIG and PC** (P.61).
- (\*4) Refer to Check Point (Handset) (P.48)

# 11.7. RF Specification

## 11.7.1. Base Unit

Item	Value	Refer to *
TX Power	19 dBm ~ 25 dBm	Check Point (Base Unit) (J)
Modulation	$-370\pm30/+370\pm30$ kHz/div & Modulated width $\geq$ 690 kHz	Check Point (Base Unit) (K)
Frequency Offset	-50 kHz ~ +50 kHz	Check Point (Base Unit) (L)
Frequency Drift		Check Point (Base Unit) (M)
RX Sensitivity	• •	Check Point (Base Unit) (N)
Timing Accuracy	< ± 5.0 ppm/<±15.0 ppm	Check Point (Base Unit) (O)
Power RAMP	Power RAMP is matching	Check Point (Base Unit) (P)

<sup>\*:</sup> Refer to Check Point (Base Unit) (P.44)

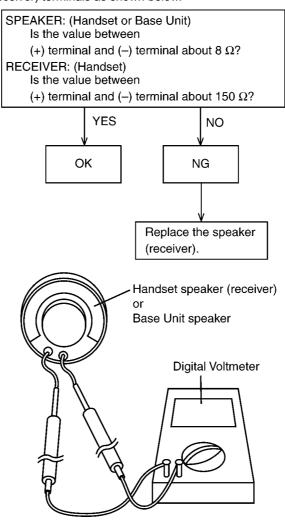
## 11.7.2. Handset

Item	Value	Refer to **
TX Power	19 dBm ~ 25 dBm	Check Point (Handset) (I)
Modulation	-370±30/+370±30 kHz/div & Modulated width ≥ 690 kHz	Check Point (Handset) (J)
Frequency Offset	-50 kHz ~ +50 kHz	Check Point (Handset) (K)
Frequency Drift	< ± 35 kHz / ms	Check Point (Handset) (L)
RX Sensitivity	< 1000 ppm	Check Point (Handset) (M)
Power RAMP	Power RAMP is matching	Check Point (Handset) (N)

<sup>\*\*:</sup> Refer to Check Point (Handset) (P.48)

# 11.8. How to Check the Speaker or Receiver

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



# 11.9. Frequency Table (MHz)

	BASE UNIT		HANDSET		
Channel No	Transmit Frequency	Receive Frequency	Transmit Frequency	Receive Frequency	
1	1897.344	1897.344	1897.344	1897.344	
2	1895.616	1895.616	1895.616	1895.616	
3	1893.888	1893.888	1893.888	1893.888	
4	1892.160	1892.160	1892.160	1892.160	
5	1890.432	1890.432	1890.432	1890.432	
6	1888.704	1888.704	1888.704	1888.704	
7	1886.976	1886.976	1886.976	1886.976	
8	1885.248	1885.248	1885.248	1885.248	
9	1883.520	1883.520	1883.520	1883.520	
10	1881.792	1881.792	1881.792	1881.792	

Note:

Channel No. 10: In the Test Mode on Base Unit and Handset.

# **12 Miscellaneous**

# 12.1. CPU Data (Base Unit)

# 12.1.1. IC7 (BBIC)

Pin No.	Description	I/O	Connection	at Normal mode	at Reset mode
1	VSS_LNA1	-	GND	-	-
2	RF_RXp	A.I	RF_RXp	A.I	A.I
3	RF_RXn	A.I	RF_RXn	A.I	A.I
4	VSS_LNA2	-	GND	-	-
5	RFP1	D.O	RXON	O_0/1	Hi-Z
6	RFP0	D.O	ANT1	O_0/1	Hi-Z
7	REF_RES	A.O	REF_RES	A.O	A.O
8	AVS_XTAL	-	GND	-	-
9	XTAL2	A.I	XTAL2	A.I	A.I
10	XTAL1	A.I	XTAL1	A.I	A.I
11	AVD_XTAL	-	AVD_XTAL		A.1
12	RF_SUPPLY1		RF_SUPPLY1		
13	VDD1	-	VDD1	ļ <sup>-</sup>	-
14	SPI2_EN/P4_0	D.O	TAM_EN	- 0.0/1	I-PU
15	SPI2_EIN/P4_0 SPI2_CLK/P4_1	D.O	SPI2_CLK	O_0/1 O_0/1	I-PU
16		D.O			I-PU
	SPI2_DO/P4_2		SPI2_DO	O_0/1 I_0/1	I-PU
17	SPI2_DI/P4_3	D.I	SPI2_DI		
18	P4_4	D.O	LED1	O_0/1	I-PU
19	LDO_CTRL	A.O	LDO_CTRL	A.O	0-1
20	AVD	-	AVD	-	-
21	LSRn	A.O	LSRn	A.O	A.O
22	LSRp	A.O	LSRp	A.O	A.O
23	VREFm	-	GND	-	-
	MICh	A.I	MICh	A.I	A.I
25	CIDOUT/MICn	A.O	CIDOUT	A.O	A.I
26	CIDINn/MICp	A.I	CIDINn	A.I	A.I
27	CIDINp/VREFp	A.I	CIDINp	A.I	A.I
	PULSE_CTRL	D.O	N.C.	O_0/1	A.I
29	RINGn/P3_6	D.O	HOOK	O_0/1	A.I
30	RINGOUT/RINGING/	A.I	RINGING	A.I	A.I
	P3_5				
	PARADET/P3_4	A.I	PARADET	A.I	A.I
	ADC0/P3_3	A.I	ADC0	A.I	A.I
33	ADC1/INT0/P1_0	A.I	ADC1	A.I	I-PU
34	NTC/ADC2	-	GND	-	A.I
35	SOCp	-	GND	-	A.I
36	SOCn	-	GND	-	A.I
37	CHARGE_CTRL	A.O	N.C.	A.O	O-0
38	P1_7/CHARGE	A.I	CHARGE	A.I	I-PD
39	DP1/PAOUTp/P3_1	D.O	DP1(N.C.)	D.O	O-0
40	VDDPA	-	GND	-	-
	DP0/PAOUTn/P3_0	D.O	DP0(N.C.)	D.O	O-0
42	VBAT1	-	VBAT1	-	-
43	P4_5	D.O	LED2	O_0/1	I-PU
44	P4_6	D.O	N.C.	O_0/1	I-PU
45	P4 7	D.O	N.C.	O_0/1	I-PU
46	VBAT2	-	VBAT2	-	-
47	CP_C1x	A.I/O	N.C.	A.I/O	A.I
48	CP C2x	A.I/O	CP_C2x	A.I/O	A.I
49	CP_C1y	A.I/O	N.C.	A.I/O	A.I
50	VBAT3	-	VBAT3	-	-
51	CP_C2y	A.I/O	CP_C2y	A.I/O	A.I
52	CP_VOUT1/LED1	A.O	CP_VOUT1	A.O	A.I
53	CP_VOUT2/LED2	A.O	CP_VOUT2	A.O	A.I
54	PON/P1_6	D.I	CHARGE_DET	I_0/1	I-PD
55	VDD2	-	+1.8V		-
	P2_7/BXTAL	D.O	CLK	O_0/1	I-PU
	P1_5/INT5/RDI/VDDE	D.I	ROW0	I_0/1	0-1
58	P1_4/INT4/TDOD	D.I	ROW1	I_0/1	I-PD
50	1_7/114/1000	D.1	I NO VV I	]'_''	-i D

Pin No.	Description	I I/O	Connection	at Normal mode	at Reset mode
	P1_3/INT3/SIO	D.I	ROW2	I 0/1	I-PD
60	P1_2/INT2/SK	D.I	ROW3	I 0/1	I-PU
61	P1_1/INT1/LE	D.I	N.C.	I 0/1	I-PU
62	P2_6/WTF_IN	-	GND	-	I-PU
63	P0_7/SPI_DI	D.I	N.C.	I_0/1	I-PU
64	P0_6/SPI_DO	D.O	N.C.	O 0/1	I-PU
65	P0_5/SPI_CLK	D.O	N.C.	O_0/1	I-PU
66	P0_4/SPI_EN	D.O	N.C.	O_0/1	I-PU
67	P0_3/SCL2	D.O	SCL2	O_0/1	I-PU
68	P0_2/SDA2	D.I/O	SDA2	I/O_0/1	I-PU
69	P0_1/URX/PWM0	D.I	URX	I_0/1	I-PU
70	P0_0/UTX	D.O	UTX	O_0/1	I-PU
71	P5_0	D.O	KEY0	O_0/1	I-PU
72	P5_1	D.O	KEY1	O_0/1	I-PU
73	P5_2	D.O	KEY2	O_0/1	I-PU
74	P5_3	D.O	KEY3	O_0/1	I-PU
75	P5_4	D.O	KEY4	O_0/1	I-PU
76	RSTn	A.O	RSTn	A.O	I-PU
77	JTAG	D.I/O	JTAG	I/O_0/1	I-PU
78	P2_5/PCM_FSC/SF	D.O	PCM_FSC	O_0/1	I-PU
79	P2_4/SCL1/PCM_DO/ DP3	D.O	PCM_DO	O_0/1	I-PU
80	P2_3/SDA1/PCM_DI/DP2		PCM_DI	I_0/1	I-PU
81		D.O	PCM_CLK	O_0/1	I-PU
82	P5_5	D.O	KEY5	O_0/1	I-PU
83	P5_6	D.O	EEP_WP	O_0	I-PU
84	P5_7	D.O	N.C.	O_Low	I-PU
85	P2_1/ECZ2/PWM1/LED4	D.O	TAM_RESET	O_0/1	I
86	P2_0/ECZ1/PWM0/LED3	D.O	Low_Rad	O_0/1	I
87	NC	-	NC	-	-
88	VSS	-	GND	-	-
89	VDD3	-	+1.8V	-	-
90	LDORF_CTRL	A.I	LDORF_CTRL	A.I	A.I
91	RF_SUPPLY2	-	RF_SUPPLY2	-	-
92	RFP0n	D.O	ANT2	O_0/1	Hi-Z
93	RFP4	D.O	PON	O_0/1	Hi-Z
94	RFP3	D.O	PSEL	O_0/1	Hi-Z
95	VDD_PADR	A.O	VDD_PADRV	A.O	A.O
96	VSS_PADR1	-	GND	-	-
97	RF_TXn	A.O	TXp	A.O	A.O
98	RF_TXp	A.O	TXn	A.O	A.O
99	VSS_PADR2	-	GND	-	-
100	RFP2	D.O	TXON	D.O	Hi-Z
101	GND	-	GND	-	-

# 12.2. CPU Data (Handset)

# 12.2.1. IC1 (BBIC)

Pin No.	Description	I/O	Connection	at Normal mode	at Reset mode
1	VSS_LNA1	-	GND	-	-
2	RF_RXp	A.I	RF_RXp	A.I	A.I
3	RF_RXn	A.I	RF_RXn	A.I	A.I
4	VSS_LNA2	-	GND	-	-
5	RFP1	D.O	RXON	O_0/1	Hi-Z
6	RFP0	D.O	ANT1	O_0/1	Hi-Z
7	REF_RES	A.O	REF_RES	A.O	A.O
8	AVS_XTAL	-	GND	-	-
9	XTAL2	A.I	XTAL2	A.I	A.I
10	XTAL1	A.I	XTAL1	A.I	A.I
	AVD_XTAL	-	AVD_XTAL	-	-
	RF_SUPPLY1	-	RF_SUPPLY1	-	-
	LDO_CTRL	A.O	LDO_CTRL	A.O	0-1
14	AVD	-	+1.8V	-	-
15	LSRn	A.O	LSRn	A.O	A.O
1	LSRp	A.O	LSRp	A.O	A.O
17	VREFM	-	GND	- A.I.	-
	MICh CIDOUT/MICn	A.I A.I	N.C. MICn	A.I	A.I
	CIDOUT/MICh CIDINn/MICp	A.I A.I	MICh MICp	A.I A.I	A.I A.I
	CIDINn/MICp CIDINp/VREFp	A.I A.O	VREFp	A.I A.O	A.I A.I
	RINGp/P3_7	D.O	COL4	O_0/1	A.I
	RINGn/P3_7	D.O D.O	COL4 COL3	O_0/1 O_0/1	A.I
24	RINGOUT/RINGING/	D.O D.O	COL2	O_0/1	A.I
	P3_5	D.0	OOLZ	0_0/1	A.i
25	PARADET/P3_4	D.O	COL1	O_0/1	A.I
26	ADC0/P3_3	D.O	COLO	O_0/1	A.I
	ADC1/INT0/P1_0	D.I	ROW0	I_0/1	I-PU
	NTC/ADC2	A.I	ADC2	I_0	A.I
	SOCp	A.I	SOCp	A.I	A.I
30	SOCn	A.I	SOCn	A.I	A.I
31	CHARGE_CTRL	A.O	CHARGE_CTRL	A.O	O-0
32	P1_7/CHARGE	A.I	CHARGE	A.I	I-PD
33	PAOUTp/P3_1	A.O	PAOUTp	A.O	O-0
34	VDDPA	-	VDDPA	-	-
35	PAOUTn/P3_0	A.O	PAOUTn	A.O	O-0
36	VBAT1	-	VBAT1	-	-
37	CP_C1x	A.I/O	CP_C1x	A.I/O	A.I
38	CP_C2x	A.I/O	CP_C2x	A.I/O	A.I
39	CP_C1y	A.I/O	CP_C1y	A.I/O	A.I
	VBAT2	-	VBAT2	-	-
41	CP_C2y	A.I/O	CP_C2y	A.I/O	A.I
	CP_VOUT1/LED1	A.O	CP_VOUT1	A.O	A.I
43	CP_VOUT2/LED2	A.O	CP_VOUT2	A.O	A.I
44	PON/P1_6	A.I	PON	A.I	I-PD
45	VDD1	-	+1.8V	- 0.0/1	- I DI I
46 47	P2_7/BXTAL P1_5/INT5/RDI/VDDE	D.O	COL5 N.C.	O_0/1	I-PU
	P1_4/INT4/TDOD	D.O D.O	DCDC_REG_CS	O_0 O_0/1	O-1 I-PD
	P1_4/INT4/TDOD P1_3/INT3/SIO	D.U	ROW3	U_0/1 I_0/1	I-PD
50	P1_2/INT2/SK	D.I	ROW3 ROW2	I_0/1 I_0/1	I-PU
51	P1_1/INT1/LE	D.I	ROW2	I_0/1	I-PU
1	P2_6/WTF_IN	D.O	KEY_LED	O_0/1	I-PU
53	P0_7/SPI_DI	D.O	EEPROM_WP	O_0/1	I-PU
54	P0_6/SPI_DO	D.O	LCD_SDA	O_0/1	I-PU
55	P0_5/SPI_CLK	D.O	LCD_SCL	O_0/1	I-PU
56	P0_4/SPI_EN	D.O	LCD_CD	O_0/1	I-PU
	P0_3/SCL2	D.O	SCL	O_0/1	I-PU
	P0_2/SDA2	D.I/O	SDA	I/O_0/1	I-PU
59	P0_1/URX	D.I	URX	I_0/1	I-PU
60	P0_0/UTX	D.O	UTX	O_0/1	I-PU
61	RSTn	D.O	RSTn	O_0/1	I-PU
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### KX-TG7331BX//KX-TGA731BX

Pin No.	Description	I/O	Connection	at Normal mode	at Reset mode
62	JTAG	D.I/O	JTAG	I/O_0/1	I-PU
63	P2_5/PCM_FSC/SF	D.O	LCD_CSB	O_0/1	I-PU
64	P2_4/SCL1/PCM_DO/ DP3	D.O	N.C.	O_0	I-PU
65	P2_3/SDA1/PCM_DI/DP2	D.O	N.C.	0_0	I-PU
66	P2_2/PCM_CLK/CLK100	D.O	LCD_RESET	O_0/1	I-PU
67	P2_1/ECZ2/PWM1/LED4	D.I	N.C.	0_0	A.I
68	P2_0/ECZ1/PWM0/LED3	D.O	BELL_LED_A	A.I	A.I
69	VDD2	-	+1.8V	-	-
70	LDORF_CTRL	A.I	N.C.	A.I	A.I
71	RF_SUPPLY2	-	RF_SUPPLY2	-	-
72	RF0n	D.O	ANT2	O_0/1	Hi-Z
73	RFP4	D.O	PON	O_0/1	Hi-Z
74	RFP3	D.O	PSEL	O_0/1	Hi-Z
75	VDD_PADR	A.O	VDD_PADRV	A.O	A.O
76	VSS_PADR1	-	GND	-	-
77	RF_TXp	A.O	TXp	A.O	A.O
78	RF_TXn	A.O	TXn	A.O	A.O
79	VSS_PADR2	-	GND	-	-
80	RFP2	D.O	TXON	O_0/1	Hi-Z
81	GND	-	GND	-	-

## 12.3. How to Replace the Flat Package IC

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

#### 12.3.1. 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.

• Flux

Recommended Flux: Specific Gravity  $\rightarrow$  0.82. Type  $\rightarrow$  RMA (lower residue, non-cleaning type)

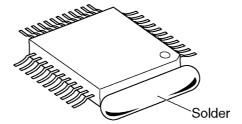
Note: See About Lead Free Solder (Pbf: Pb free) (P.4)

#### 12.3.2. How to Remove the IC

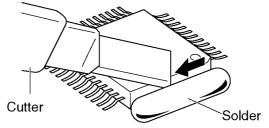
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

Note:

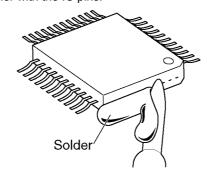
If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



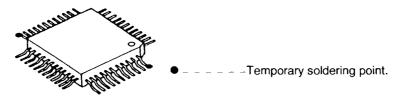
3. While the solder melts, remove it together with the IC pins.



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

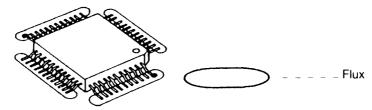
### 12.3.3. How to Install the IC

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

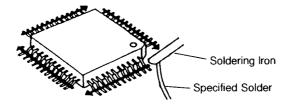


\*Check the accuracy of the IC setting with the corresponding soldering foil.

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

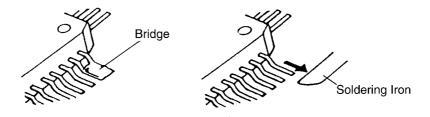


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



## 12.3.4. How to Remove a Solder Bridge

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



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

### 12.4.1. Preparation

- PbF (: Pb free) Solder
- · Soldering Iron

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

### Note:

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

• Hot Air Desoldering Tool

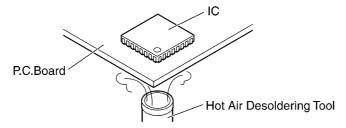
Temperature: 608°F ± 68°F (320°C ± 20°C)

### 12.4.2. Caution

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

### 12.4.3. How to Remove the IC

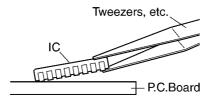
1. Heat the IC with a hot air desoldering tool through the P.C.Board.



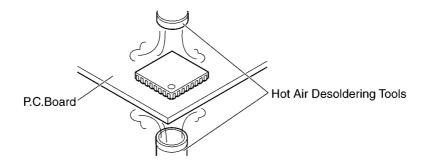
2. Pick up the IC with tweezers, etc. when the solder is melted completely.

#### Note:

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



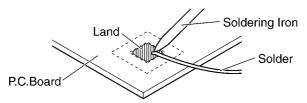
When it is hard to melt the solder completely, heat it with a hot air desoldering tool through the IC besides through the P.C.Board.



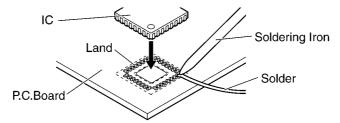
3. After removing the IC, clean the P.C.Board of residual solder.

### 12.4.4. How to Install the IC

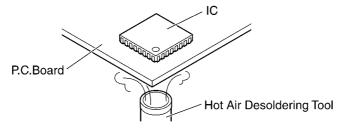
1. Place the solder a little on the land where the radiation GND pad on IC bottom is to be attached.



- 2. Place the solder a little on the land where IC pins are to be attached, then place the IC. **Note:** 
  - When placing the IC, the positioning should be done very carefully.



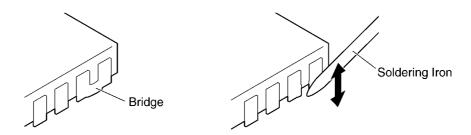
- 3. Heat the IC with a hot air desoldering tool through the P.C.Board until the solder on IC bottom is melted. **Note:** 
  - Be sure to place it precisely, controlling the air volume of the hot air desoldering tool.



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

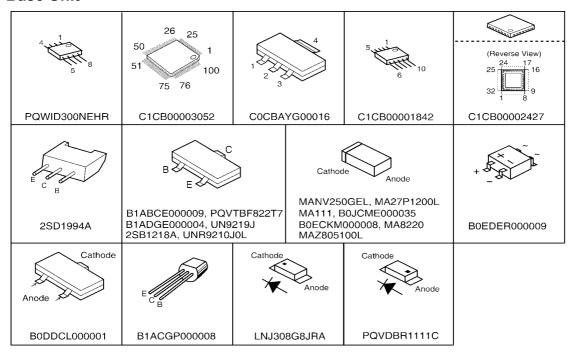
### 12.4.5. How to Remove a Solder Bridge

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

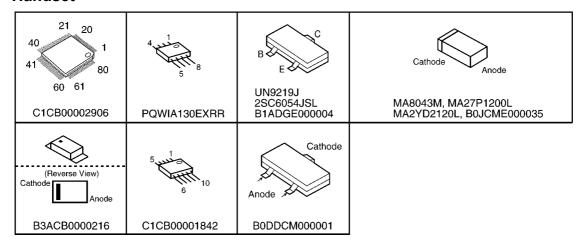


## 12.5. Terminal Guide of the ICs, Transistors and Diodes

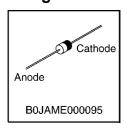
## 12.5.1. Base Unit



### 12.5.2. Handset



## 12.5.3. Charger Unit



# 13 Schematic Diagram

## 13.1. For Schematic Diagram

## 13.1.1. Base Unit (Schematic Diagram (Base Unit\_Main))

### Notes:

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

Important Safety Notice:

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

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

### 13.1.2. Handset (Schematic Diagram (Handset))

### Notes:

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

### 13.1.3. Charger Unit (Schematic Diagram (Charger Unit))

### Notes:

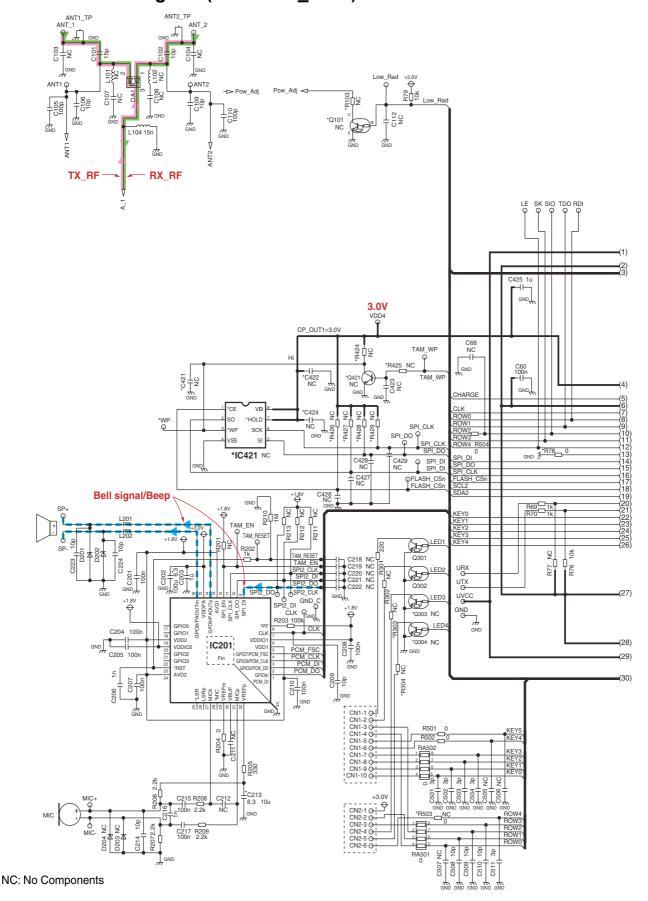
1. DC voltage measurements are taken with voltmeter from the negative voltage line.

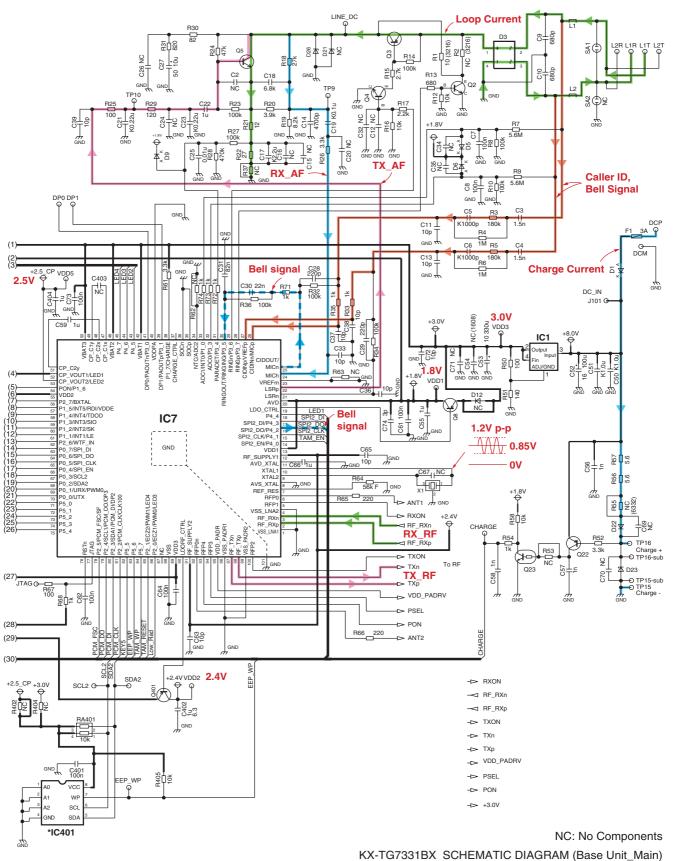
Important Safety Notice:

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

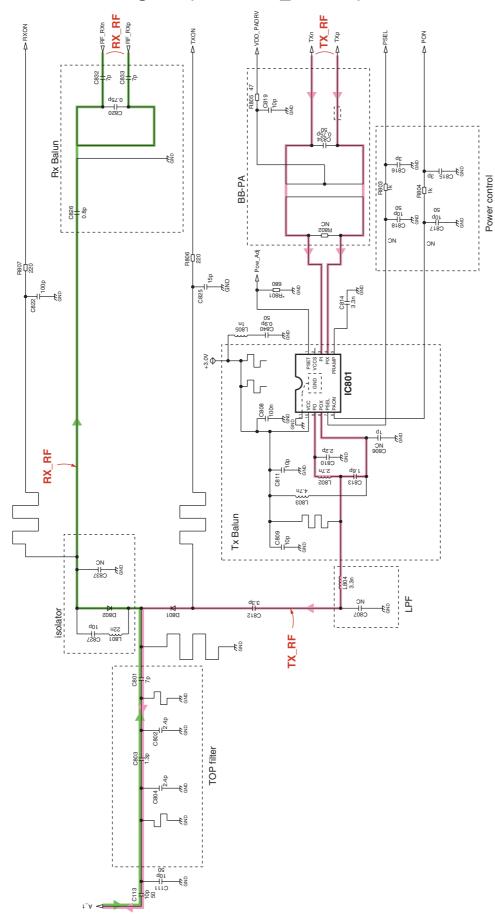
2. The schematic diagram may be modified at any time with the development of new technology.

# 13.2. Schematic Diagram (Base Unit\_Main)



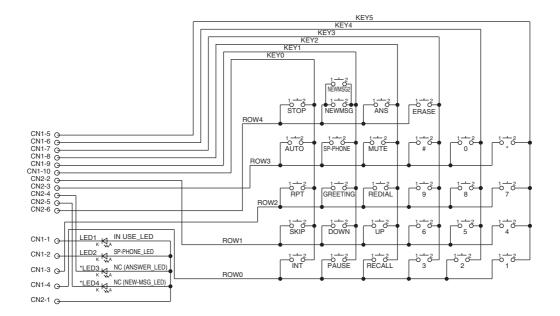


# 13.3. Schematic Diagram (Base Unit\_RF Part)



NC: No Components KX-TG7331 SCHEMATIC DIAGRAM (Base Unit\_RF Part)

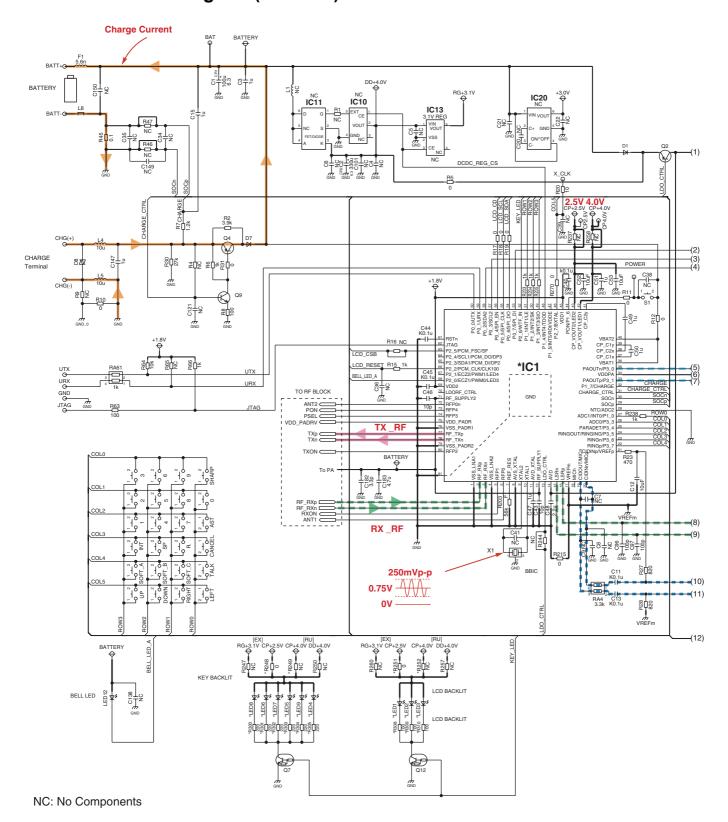
# 13.4. Schematic Diagram (Base Unit\_Operation)

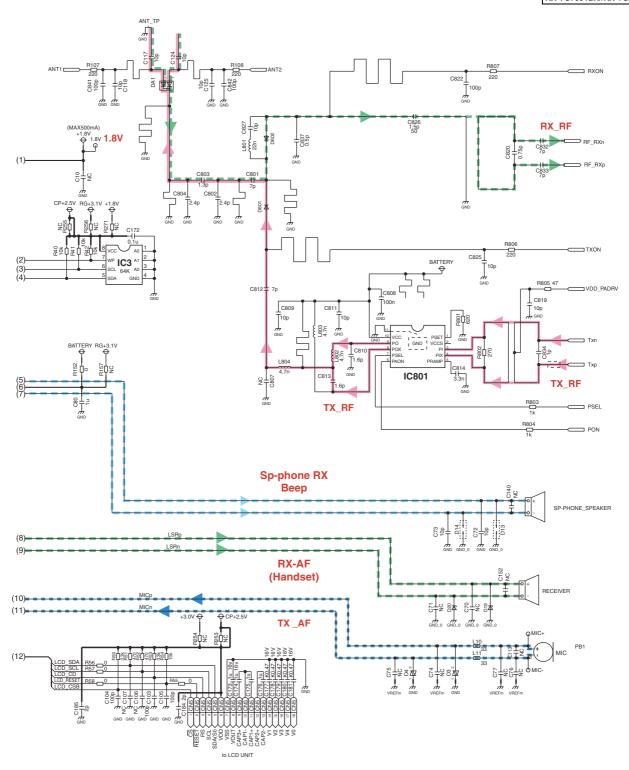


NC: No Components

KX-TG7331 SCHEMATIC DIAGRAM (Base Unit\_Operation)

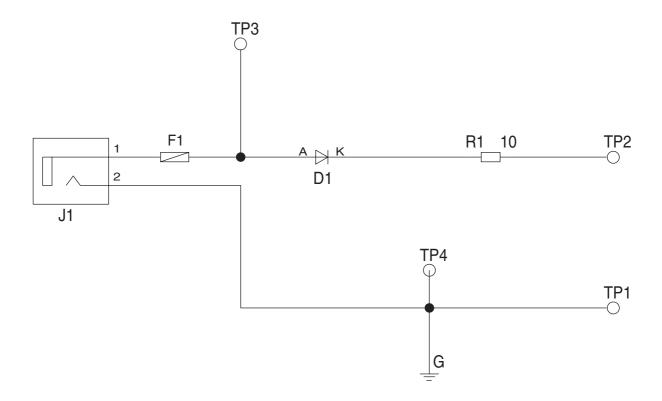
# 13.5. Schematic Diagram (Handset)





NC: No Components
KX-TGA731 SCHEMATIC DIAGRAM (Handset\_Main)

# 13.6. Schematic Diagram (Charger Unit)

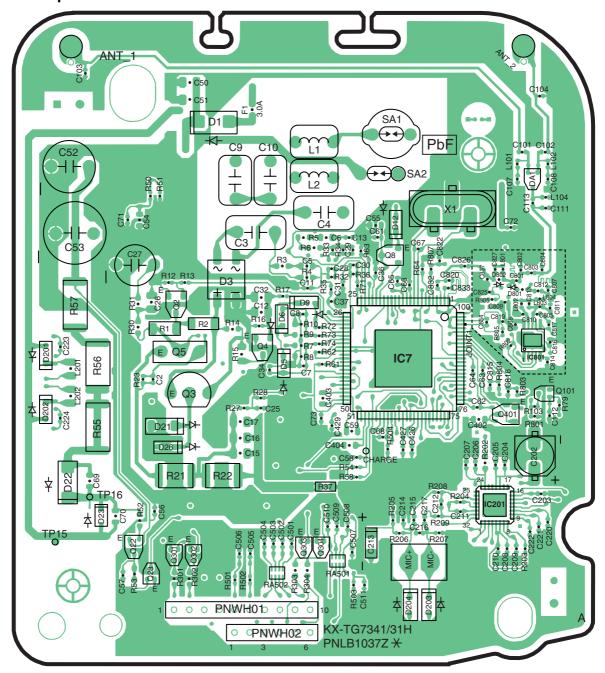


SCHEMATIC DIAGRAM (Charger Unit)

# **14 Printed Circuit Board**

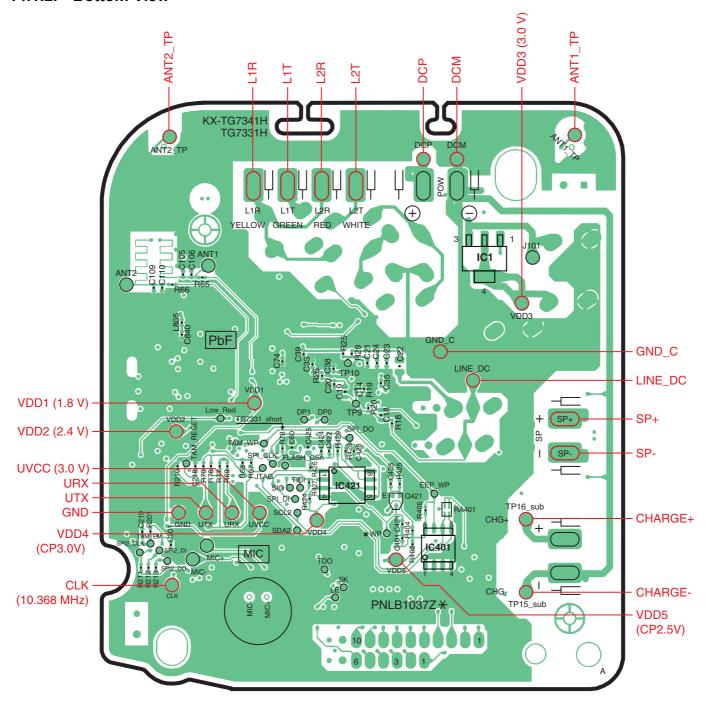
# 14.1. Circuit Board (Base Unit\_Main)

## 14.1.1. Component View



KX-TG7331 CIRCUIT BOARD (Base Unit\_Main (Component View))

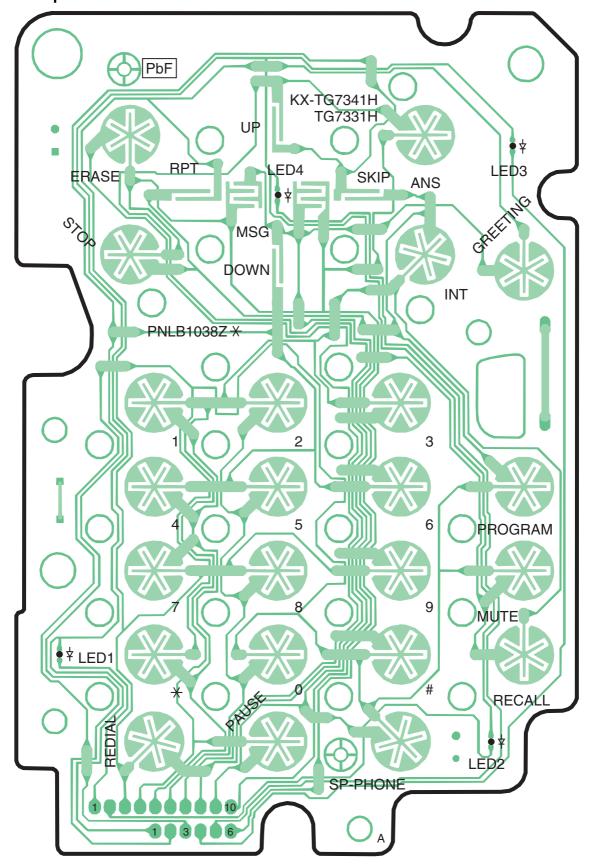
### 14.1.2. Bottom View



KX-TG7331 CIRCUIT BOARD (Base Unit\_Main (Bottom View))

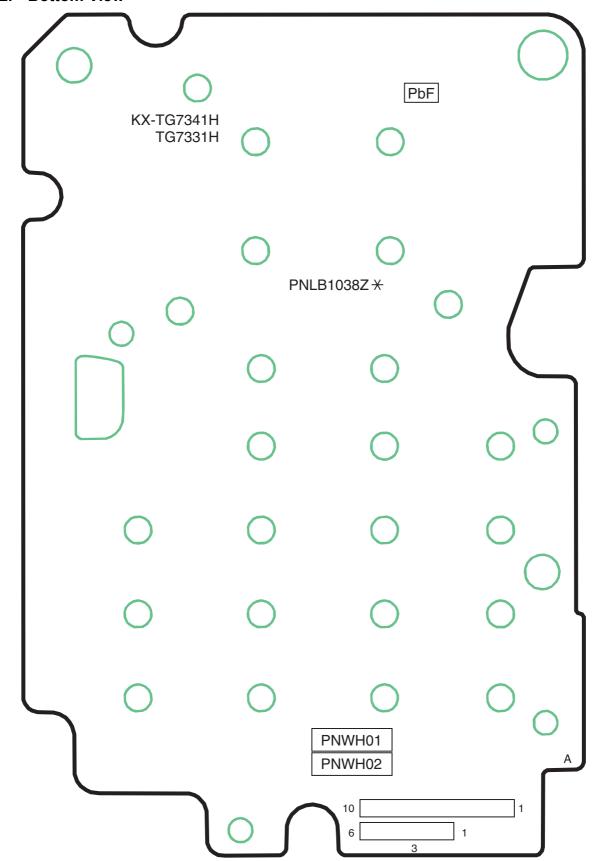
# 14.2. Circuit Board (Base Unit\_Operation)

## 14.2.1. Component View



KX-TG7331 CIRCUIT BOARD (Base Unit\_Operation (Component View))

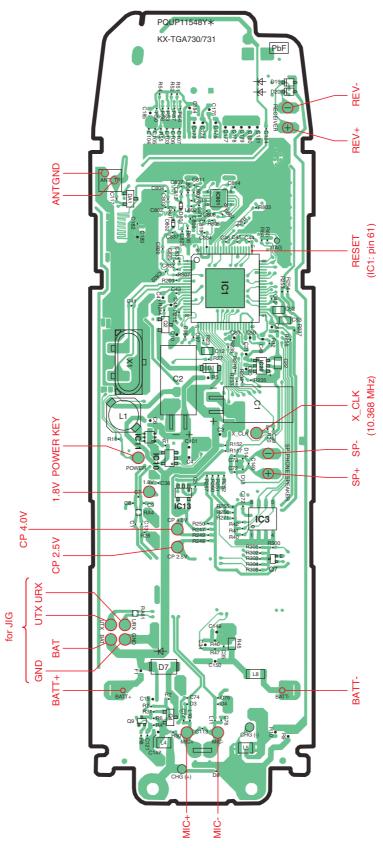
14.2.2. Bottom View



KX-TG7331 CIRCUIT BOARD (Base Unit\_Operation (Bottom View))

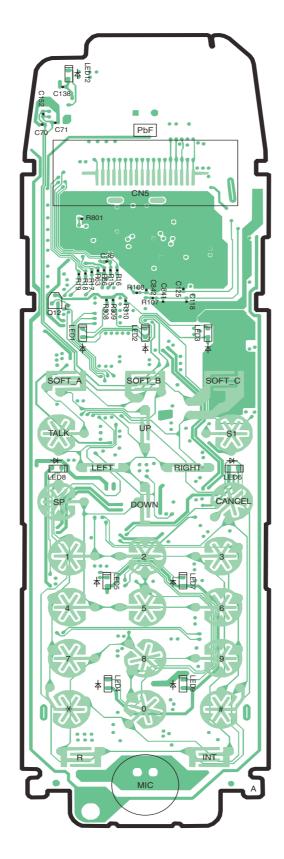
# 14.3. Circuit Board (Handset)

## 14.3.1. Component View



KX-TGA731 CIRCUIT BOARD (Handset (Component View))

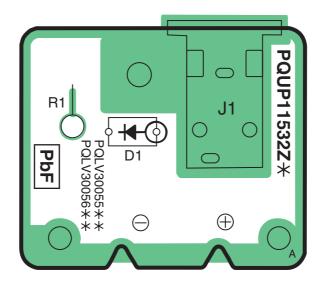
## 14.3.2. Bottom View



KX-TGA731 CIRCUIT BOARD (Handset (Bottom View))

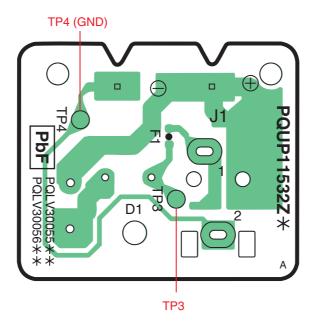
# 14.4. Circuit Board (Charger Unit)

# 14.4.1. Component View



CIRCUIT BOARD (Charger unit (Component View))

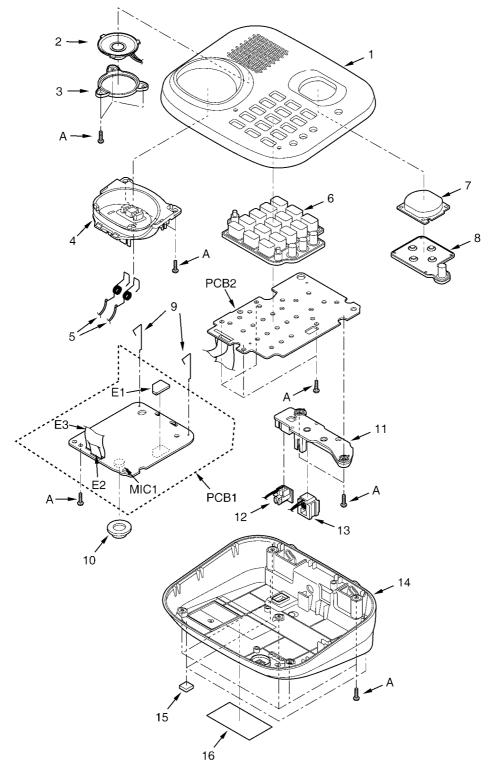
## 14.4.2. Bottom View



CIRCUIT BOARD (Charger unit (Bottom View))

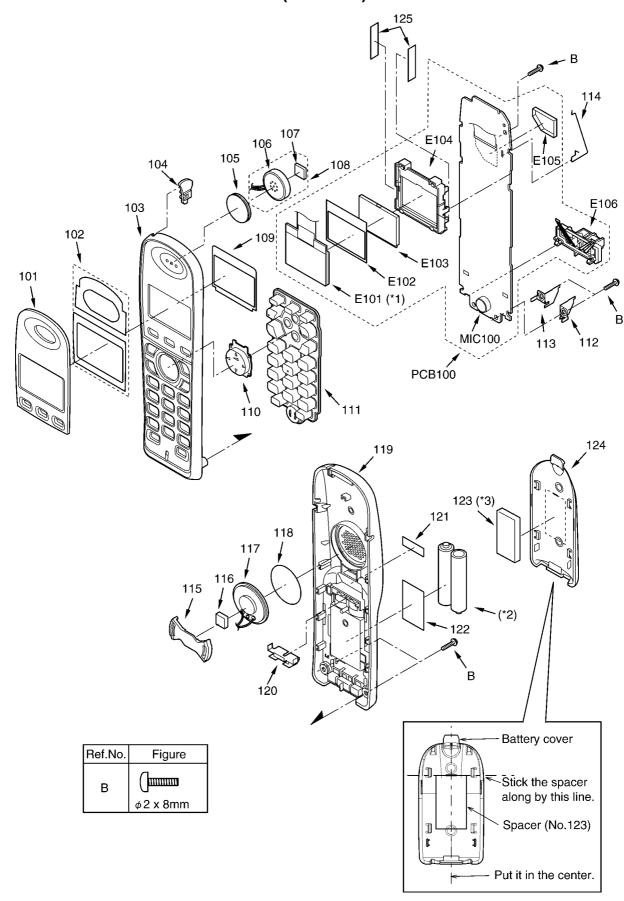
# 15 Exploded View and Replacement Parts List

# 15.1. Cabinet and Electrical Parts (Base Unit)



Ref.No.	Figure
А	Φ 2.6 x 8mm

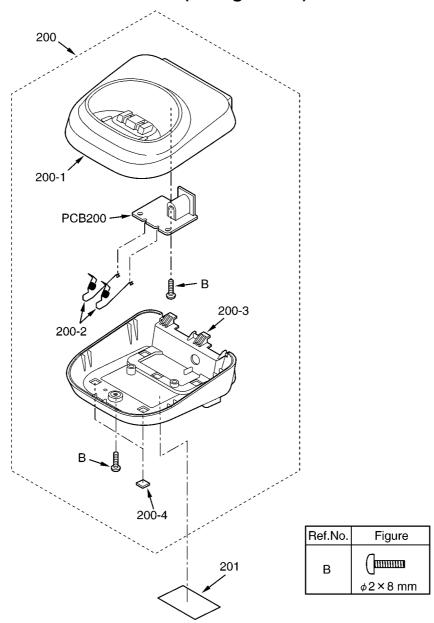
## 15.2. Cabinet and Electrical Parts (Handset)



### Note:

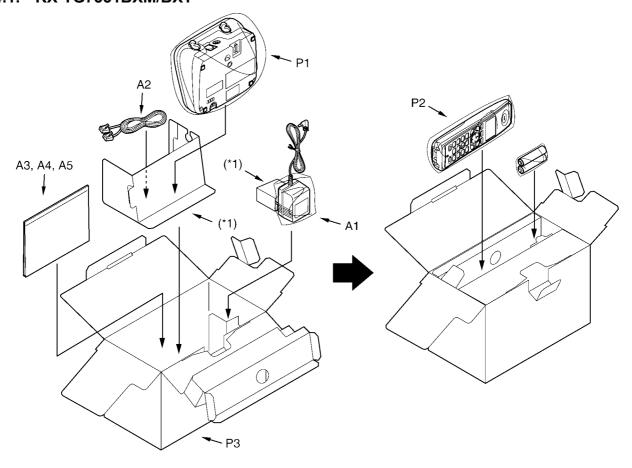
- (\*1) This cable is fixed by welding. Refer to **How to Replace the Handset LCD** (P.56).
- (\*2) The rechargeable Ni-MH battery HHR-4MPT is available through sales route of Panasonic.
- (\*3) Attach the spacer (No. 123) to the exact location described above.

# 15.3. Cabinet and Electrical Parts (Charger Unit)



# 15.4. Accessories and Packing Materials

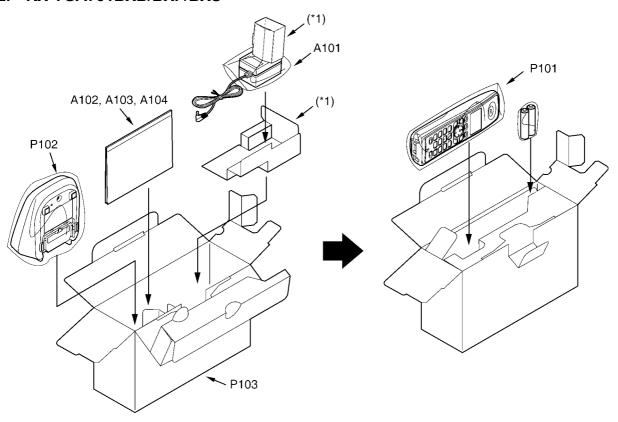
## 15.4.1. KX-TG7331BXM/BXT



### Note:

(\*1) These pads are pieces of Ref No. P3 (GIFT BOX).

## 15.4.2. KX-TGA731BXB/BXF/BXS



### Note:

(\*1) These pads are pieces of Ref No. P103 (GIFT BOX).

## 15.5. Replacement Part 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  $\triangle$  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 ( $\Omega$ ) k=1000  $\Omega$ , M=1000 k $\Omega$  All capacitors are in MICRO FARADS ( $\mu$ F)p= $\mu\mu$ F

\*Type & Wattage of Resistor

#### Type

ERC:Solid ERDS:Carbon ERJ:Chip	ERG:Metal Oxide	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

	ECCD,ECKD,ECBT,F1K,ECUV:Ceramic ECQE,ECQV,ECQG:Polyester
ECUV,PQCUV,ECUE:Chip	ECEA,ECST,EEE:Electlytic ECQP:Polypropylene

### Voltage

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

### 15.5.1. Base Unit

### 15.5.1.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	1	PNKM1043Z2	CABINET BODY (for KX- TG7331BXM)	PS-HB
	1	PNKM1043Z1	CABINET BODY (for KX- TG7331BXT)	PS-HB
	2	L0AA04A00028	SPEAKER	
	3	PQHR11082Z	GUIDE, SPEAKER	POM-HB
	4	PNKE1001Y2	CASE, CHARGE TERMINAL	PS-HB
	5	PNJT1003Z	CHARGE TERMINAL	
	6	PNJK1024Y	KEYBOARD SWITCH, DIAL (for KX-TG7331BXM)	
	6	PNJK1024Z	KEYBOARD SWITCH, DIAL (for KX-TG7331BXT)	

Safety	Ref.	Part No.	Part Name & Description	Remarks
bulooy	No.	1410 1101	Tare Name a Bescription	11021102112
	7	PNBC1242Z2	BUTTON, VOL KEY (for KX-TG7331BXM)	ABS-HB
	7	PNBC1242Z1	BUTTON, VOL KEY (for KX-TG7331BXT)	ABS-HB
	8	PNJK1026Y	KEYBOARD SWITCH (for KX-TG7331BXM)	
	8	PNJK1026Z	KEYBOARD SWITCH (for KX-TG7331BXT)	
	9	PNLA1004Z	ANTENNA	
	10	PQMG10025W	RUBBER PARTS, MIC	
	11	PNHR1038Z	GUIDE, JACK	PS-HB
	12	K2ECYZ000001	JACK, DC	
	13	PQJJ1T039U	JACK, MODULAR	
	14	PNKF1032Z1	CABINET COVER	PS-HB
	15	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	
	16	PNGT1853Y	NAME PLATE (for KX- TG7331BXM)	
	16	PNGT1853Z	NAME PLATE (for KX- TG7331BXT)	

### 15.5.1.2. Main P.C.Board Parts

### Note:

- (\*1) When replacing IC7, IC401 or X1, make the adjustment using PQZZTG7331BX. Refer to **Base Unit** (P.64) of **Things to Do after Replacing IC or X'tal.**
- (\*2) When you removing E1, use special tools (ex. Hot air disordering tool).
- (\*3) Backside of this IC has a ground plate.
- (\*4) Supplied IC is Flat Package Type.

Safety	1	Part No.	Part Name & Description	Remarks
	No.			
	PCB1	PNWP17331BXH	MAIN P.C.BOARD ASS'Y (RTL)	
			(ICs)	
	IC1	C0CBAYG00016	IC	S
	IC7	C1CB00003052	IC(BBIC)(*1)(*3)(*4)	
	IC201	C1CB00002427	IC	
	IC401	PQWID300NEHR	IC (EEPROM) (*1)	
	IC801	C1CB00001842	IC (*3)	
			(TRANSISTORS)	
	Q2	B1ABCE000009	TRANSISTOR(SI)	
	Q3	B1ACGP000008	TRANSISTOR(SI)	
	Q4	PQVTBF822T7	TRANSISTOR(SI)	
	Q5	2SD1994A	TRANSISTOR(SI)	
	Q8	B1ADGE000004	TRANSISTOR(SI)	
	Q22	2SB1218A	TRANSISTOR(SI)	
	Q23	UNR9210J0L	TRANSISTOR(SI)	
	Q301	UN9219J	TRANSISTOR(SI)	S
	Q302	UN9219J	TRANSISTOR(SI)	S
	Q401	B1ADGE000004	TRANSISTOR(SI)	
			(DIODES)	
	D1	B0JCME000035	DIODE(SI)	
	D3	B0EDER000009	DIODE(SI)	
	D5	MA111	DIODE(SI)	S
	D6	MA111	DIODE(SI)	S
	D9	MA111	DIODE(SI)	S
	D22	B0ECKM000008	DIODE(SI)	
	D23	MA8220	DIODE(SI)	S
	D26	MANV250GEL	DIODE(SI)	
	D201	MAZ805100L	DIODE(SI)	
	D202	MAZ805100L	DIODE(SI)	
	D801	MA27P1200L	DIODE(SI)	
	D802	MA27P1200L	DIODE(SI)	
	DA1	B0DDCL000001	DIODE(SI)	
			(COILS)	
	L1	PQLQXF330K	COIL	S
	L2	PQLQXF330K	COIL	S
	L104	PQLQR4C15NJ	COIL	S
	L201	PQLQR1WT	COIL	S
	L202	PQLQR1WT	COIL	s
	L801	PQLQR4C22NJ	COIL	S

### KX-TG7331BX//KX-TGA731BX

			<u> </u>	<u>.</u>
Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	L802	G1C2N7Z00009	COIL	
	L803	G1C4N7Z00006	COIL	
	L804	G1C3N3Z00007	COIL	
	L805	G1C1N0Z00002	COIL	
			(COMPONENTS PARTS)	
	RA401	D1H410320002	RESISTOR ARRAY	
	RA501	EXB28VR000X	RESISTOR ARRAY	
	RA502	EXB28VR000X	RESISTOR ARRAY	
			(VARISTOR)	
	SA1	J0LF00000026		
	R1	PQ4R18XJ100	(RESISTORS)	s
	R3	ERJ3GEYJ184	180k	۵
	R4	ERJ3GEYJ105	1M	
	R5	ERJ3GEYJ184	180k	
	R6	ERJ3GEYJ105	1M	
	R7	ERJ3GEYJ565	5.6M	
	R8	ERJ3GEYJ104	100k	
	R9	ERJ3GEYJ565	5.6M	
	R10	ERJ3GEYJ104	100k	
	R12	ERJ2GEJ103	10k	
	R13	ERJ2GEJ681	680	
	R14	ERJ3GEYJ104	100k	
	R15	PQ4R10XJ272	2.7k	S
	R16	ERJ2GEJ103	10k	
	R17 R18	ERJ2GEJ222 ERJ2GEJ273X	2.2k 27k	
	R19	ERJ2GEJ273A ERJ2GEJ822	8.2k	
	R20	ERJ2GEJ392	3.9k	
	R21	ERJ12YJ120	12	
	R22	ERJ12YJ270	27	
	R23	ERJ2GEJ104	100k	
	R24	ERJ2GEJ473	47k	
	R25	ERJ2GEJ101	100	
	R26	ERJ2GEJ332	3.3k	
	R27	ERJ2GEJ104	100k	
	R28	ERJ2GEYJ474	470k	S
	R29	ERJ2GEJ121	120	
	R30	ERJ3GEYJ820	82	
	R31	ERJ3GEYJ821	820	
	R32 R33	ERJ2GEJ104 ERJ2GEJ102	100k 1k	
	R34	ERJ2GEJ102 ERJ2GEJ104	100k	
	R35	ERJ2GEJ102	1k	
	R36	ERJ2GEJ104	100k	
	R50	ERJ2RKF1000	100	
	R51	ERJ2RKF1400	140	
	R52	ERJ3GEYJ332	3.3k	
	R54	ERJ2GEJ102	1k	
	R56	ERJ1TYJ5R6U	5.6	
	R57	ERJ1TYJ5R6U	5.6	
	R58	ERJ2GEJ103	10k	
	R61	ERJ2GEJ332	3.3k	ļ
	R64	D0GA563ZA006	56k	
-	R65	ERJ2GEJ221	220	
-	R66 R67	ERJ2GEJ221 ERJ2GEJ101	100	
	R68	ERJ2GEJ101 ERJ2GEJ102	1k	
	R69	ERJ2GEJ102	1k	
	R70	ERJ2GEJ102	1k	
	R71	ERJ2GEJ102	1k	
	R72	ERJ2GEJ102	1k	
	R73	ERJ2GEJ102	1k	
	R74	ERJ2GEJ102	1k	
	R76	ERJ2GEJ103	10k	
	R78	ERJ2GE0R00	0	
	R79	ERJ2GEJ103	10k	
	R202	ERJ3GEYJ102	1k	
	R203	ERJ2GEJ104	100k	
1	R204 R205	ERJ2GE0R00 ERJ2GEJ331	0	
			330	Ì
			2 21-	
	R206 R207	ERJ2GEJ222 ERJ2GEJ222	2.2k 2.2k	

Safety	Ref.	Part No.	Part Name & Description	Remarks
	No. R208	ERJ2GEJ222	2.2k	
	R209	ERJ2GEJ222	2.2k	
	R210	ERJ2GEJ105X	1M	
	R301	ERJ3GEYJ221	220	
	R302	ERJ3GEYJ391	390	
	R405	ERJ2GEJ103	10k	
	R501	ERJ2GE0R00	0	
	R502	ERJ2GE0R00	0	
	R504	ERJ2GE0R00	0	
	R801	ERJ2GEJ561	560	
	R803	ERJ2GEJ102	1k	
	R804	ERJ2GEJ102	1k	
	R805	ERJ2GEJ470	47	
	R806 R807	ERJ2GEJ221 ERJ2GEJ221	220	
	R807	ERUZGEUZZI	(CAPACITORS)	
	C3	F1B2H152A048		
	C4	F1B2H152A048		
	C5	ECUV1H102KBV		
	C6	ECUV1H102KBV		
	C7	ECUE1A104KBQ		
	C8	ECUE1A104KBQ		
	C9	F1B2H681A070		
	C10	F1B2H681A070	_	
	C11	ECUE1H100DCQ	10p	
	C13	ECUE1H100DCQ	10p	
	C14	ECUE1E472KBQ	0.0047	
	C18	ERJ3GEYJ682	6.8k	
	C17	PQCUV1A225KB	2.2	
	C19	ECUV1C104KBV	0.1	
	C21	ECJ0EB0J224K	0.22	S
	C22	PQCUV1A105KB		
	C23	ECJ0EB0J224K		s
	C25	ECUE1C103KBQ		
	C27	ECEA1HKA100	10	
	C28	ECUE1H221JCQ	_	
	C29 C30	ECUE1H221JCQ ECUE1C223KBQ	_	
	C31	ECUE1C223KBQ		
	C33	ECUE1H100DCQ		
	C36	ECUE1H100DCQ		
	C37	ECUE1H100DCQ	-	
	C38	ECUE1H100DCQ	_	
	C39	ECUE1H100DCQ	10p	
	C50	PQCUV1C105KB	1	
	C51	PQCUV1C105KB	1	
	C52	ECEA1CK101	100	S
	C53	F2A1A3310040	330	
	C55	ECUV1A105KBV		
	C56	ECUE1H102KBQ		
	C57	ECUE1H102KBQ		
	C58	ECUE1H102KBQ		
	C59	ECUV1A105KBV		
<b></b>	C60	ECUV1H104KBV		
	C61 C62	ECUE1A104KBQ ECUE1A104KBQ		
	C62	ECUE1H104KBQ		
	C64	ECUE1A104KBQ		
	C65	ECUE1H104RBQ		
	C66	ECUE0J105KBQ	_	
	C72	ECUE1H100DCQ		
	C72	ECUE1A104KBQ		<u> </u>
	C74	F1G1H3R0A480		
	C101	ECUE1H150JCQ		
	C102	ECUE1H100CCQ	_	
	C105	ECUE1H101JCQ	_	
	C106	ECUE1H100DCQ		
	C109	ECUE1H100DCQ	10p	
	C110	ECUE1H101JCQ	100p	
	C113	ECUE1H100DCQ	10p	
L				. —
	C201	ECUE1A104KBQ		
	C201 C202 C203	ECUE1A104KBQ EEE0JA101WR ECUE0J105KBQ	100	

Safety	Ref.	Part No.	Part Name & Description	Remarks
	No.			
	C204	ECUE1A104KBQ		
	C205	ECUE1A104KBQ	0.1	
	C206	ECUE1H102KBQ	0.001	
	C207	ECUE1A104KBQ	0.1	
	C208	ECUE1A104KBQ	0.1	
	C209	ECUE1H100DCQ	10p	
	C210	ECUE1A104KBQ	0.1	
	C213	ECST0JY106	10	S
	C214	ECUE1H100DCQ	10p	
	C215	ECUE1A104KBQ	0.1	
	C216	ECUE1H102KBQ	0.001	
	C217	ECUE1A104KBQ	0.1	
	C223	ECUE1H100DCQ	10p	
	C224	ECUE1H100DCQ	10p	
	C401	ECUE1A104KBQ	0.1	
	C402	ECUV0J105KBV	1	
	C404	ECUV1A105KBV	1	
	C425	ECUV1A105KBV	1	
	C501	F1G1H3R0A480	3p	
	C502	F1G1H3R0A480	3p	
	C503	F1G1H3R0A480	3p	
	C504	F1G1H3R0A480	3p	
	C508	ECUE1H100DCQ	10p	
	C509	ECUE1H100DCQ	10p	
	C510	ECUE1H100DCQ	10p	
	C511	F1G1H3R0A480	3p	
	C801	F1G1H7R0A480	7p	
	C802	F1G1H2R4A480	2.4p	
	C803	F1G1H1R3A480	1.3p	
	C804	F1G1H2R4A480	2.4p	
	C808	ECUE1A104KBQ	0.1	
	C809	ECUE1H100DCQ	10p	
	C810	F1G1H2R2A480	2.2p	
	C811	ECUE1H100DCQ	10p	
	C812	F1G1H3R3A480	3.3p	
	C813	F1G1H1R6A480	1.6p	
	C814	ECUE1H332KBQ	0.0033	
	C815	F1G1H3R0A480	3p	
	C816	F1G1H3R0A480	3p	
	C819	ECUE1H100DCQ	10p	
	C820	F1G1HR75A480	0.75p	
	C822	ECUE1H101JCQ	100p	
	C825	ECUE1H150JCQ	15p	
	C826	F1G1HR80A480	0.8p	
	C827	ECUE1H100DCQ		
	C832	F1G1H7R0A480	7p	
	C833	F1G1H7R0A480		
	C834	F1G1HR75A480	_	
	C840	F1G1HR90A480	_	
			(OTHERS)	
	MIC1	L0CBAY000016	MICROPHONE	
	E1	PNMC1003Z	MAGNETIC SHIELD, CASE (*2)	
	E2	PNWHK03SH05C		
	E3	PNWHK10SH05C	LEAD WIRE, PARALLEL WIRE	
	F1	K5H302Y00003	FUSE	
	X1		CRYSTAL OSCILLATOR (*1)	
	L	1	l .	

# 15.5.1.3. Operational P.C.Board Parts

Safety	Ref.	Part No.	Part Name & Description	Remarks
	No.			
	PCB2	PNWP27331FXH	OPERATIONAL P. C. BOARD	
			ASS'Y (RTL)	
			(LEDS)	
	LED1	LNJ308G8JRA	LED	
	LED2	PQVDBR1111C	LED	S

## 15.5.2. Handset

## 15.5.2.1. Cabinet and Electrical Parts

Balety	Ref. No.	Part No.	Part Name & Description	Remarks
	101	PNGP1001Z8	PANEL, LCD (for KX- TGA731BXM)	AS-HB
	101	PNGP1001Z2	PANEL, LCD (for KX- TGA731BXB/BXT)	AS-HB
	101	PNGP1001Z4	PANEL, LCD (for KX- TGA731BXF)	AS-HB
	101	PNGP1001Z1	PANEL, LCD (for KX- TGA731BXS)	AS-HB
	102	PNHS1002Z	TAPE, DOUBLE SIDED	
	103	PNKM1004Y6	CABINET BODY (for KX- TGA731BXM)	PS-HB
	103	PNKM1004Y5	CABINET BODY (for KX-TGA731BXT)	PS-HB
	103	PNKM1004Z1	CABINET BODY (for KX- TGA731BXB)	PS-HB
	103	PNKM1004Y4	CABINET BODY (for KX- TGA731BXF)	PS-HB
	103	PNKM1004Y2	CABINET BODY (for KX- TGA731BXS)	PS-HB
	104	PNHR1002Z	OPTIC CONDUCTIVE PARTS, LED LENS	PS-HB
	105	PQHS10467Z	CASE, RECEIVER NET	
	106	L0AD02A00028	RECEIVER	
	107	PQHG10756Z	RUBBERPARTS, RECEIVER	
	108	PQWHTGA720ER	RECEIVER ASS'Y	
	109	PQHS10722Y	SPACER, LCD CUSHION	
	110	PNBC1003Y3	BUTTON, NAVIGATOR KEY (for KX-TGA731BXF/BXM/ BXS/BXT)	ABS-HB
	110	PNBC1003Z2	BUTTON, NAVIGATOR KEY (for KX-TGA731BXB)	ABS-HB
	111	PNJK1004R	RUBBER SWITCH (for KX- TGA731BXB/BXM/BXT)	
	111	PNJK1004Q	RUBBER SWITCH (for KXTGA731BXF)	
	111	PNJK1004S	RUBBER SWITCH (for KX-TGA731BXS)	
	112	PNJT1002Z	CHARGE TERMINAL (R)	
	113	PNJT1001Z	CHARGE TERMINAL (L)	
	114	PNLA1003Z	ANTENNA	
	115	PQHR11313Z	GUIDE, SPEAKER	ABS-HB
	116	PQHG10729Z	RUBBER PARTS, SPEAKER	
	117	L0AD02A00026	SPEAKER	
	118	PQHS10622Z	SPACER, SPEAKER NET	
	119	PNKF1004Z1	CABINET COVER (for KX- TGA731BXB/BXM/BXT)	
	119	PNKF1004Z4	CABINET COVER (for KX- TGA731BXF)	
	119	PNKF1004Z2	CABINET COVER (for KX- TGA731BXS)	ABS-HB
	120	PQJC10056X	BATTERY TERMINAL	
	121	PQQT23182Z PNGT1681S	LABEL, ATTENTION  NAME PLATE (for KX-	
	122	PNGT1681T	TGA731BXM)  NAME PLATE (for KX-TGA731BXT)	
	122	PNGT1681Z	NAME PLATE (for KX- TGA731BXB)	
	122	PNGT1681X	NAME PLATE (for KX- TGA731BXF)	
	122	PNGT1681Y	NAME PLATE (for KX- TGA731BXS)	
	123	PQHS10561Y	SPACER, BATTERY COVER	
	124	PNKK1001Z2	LID, BATTERY (for KX- TGA731BXB/BXM/BXT)	ABS-HB
	124	PNKK1001Z4	LID, BATTERY (for KX- TGA731BXF)	ABS-HB
	124	PNKK1001Z1	LID, BATTERY (for KX- TGA731BXS)	ABS-HB
			IGA/SIDAD/	

### 15.5.2.2. Main P.C.Board Parts

### Note:

- (\*1) Reconfirm the model No. written on the handset's name plate when replacing PCB100. Because the model No. of the optional handset may differ from the included handset. (\*2) When replacing IC1, IC3 or X1, make the adjustment using PQZZTG7331BX. Refer to **Handset** (P.65) of **Things to Do after Replacing IC or X'tal.**
- (\*3) When replacing the Handset LCD, See **How to** Replace the Handset LCD (P.56).
- (\*4) When you removing E105, use special tools (ex. Hot air disordering tool).
- (\*5) Backside of this IC has a ground plate.
- (\*6) Supplied IC is Flat Package Type.

Safety	Ref.	Part No.	Part Name & Description	Remarks
	PCB100	PNWPGA731BXR	MAIN P.C.BOARD ASS'Y (RTL) (*1)	
			(ICs)	
	IC1	C1CB00002906	IC (BBIC (FLASH)) (*2) (*5) (*6)	
	IC3	POWIA130EXRR	IC (EEPROM) (*2)	
	IC801	C1CB00001842		
			(TRANSISTORS)	
	Q2	B1ADGE000004	TRANSISTOR(SI)	
	Q4		TRANSISTOR(SI)	
	07	UN9219J	TRANSISTOR(SI)	S
	Q9	2SC6054JSL	TRANSISTOR(SI)	
	012	UN9219J	TRANSISTOR(SI)	S
	-		(DIODES)	
	D1	MA2YD2120L	DIODE(SI)	
	D7	B0JCME000035		
	D19	MA8043M	DIODE(SI)	S
	D20	MA8043M	DIODE(SI)	S
	D801	MA27P1200L	DIODE(SI)	
	D802	MA27P1200L	DIODE(SI)	
	DA1	B0DDCM000001		
	LED1	B3ACB0000216		
	LED2	B3ACB0000216		
	LED3	B3ACB0000216		
	LED4	B3ACB0000216		
	LED5	B3ACB0000216		
	LED6	B3ACB0000216		
	LED7	B3ACB0000216	LED	
	LED8	B3ACB0000216		
	LED9	B3ACB0000216		
	LED12	B3ACB0000216		
			(COILS)	
	L4	G1C100MA0072		
	L5	G1C100MA0072		
	L801	PQLQR4C22NJ	COIL	
	L802	G1C4N7Z00006		
	L803	G1C4N7Z00006		
	L804	G1C4N7Z00006		
	F1	POLOR2M5N6K	COIL	S
		~ ~	(COMPONENTS PARTS)	
	RA4	D1H433220001	RESISTOR ARRAY	
	RA61		RESISTOR ARRAY	
			(VARISTORS)	
	D3	D4ED1180A013		
	D4	D4ED1180A013		
	D8	D4ED1270A014		
	D13	D4ZZ00000032		
	D14	D4ZZ00000032		
			(RESISTORS)	
	R2	ERJ2GEJ392	3.9k	
	R5	ERJ3GEY0R00	0	
	R6	ERJ2GEJ102	1k	
	R7	ERJ2GEJ122	1.2k	
	R8	ERJ2GEJ101	100	
<b></b>	R10	ERJ3GEY0R00	0	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R11	ERJ2GE0R00	0	
	R12	ERJ2GE0R00	0	
	R15	ERJ2GEJ102	1k	
	R17	ERJ2GE0R00 ERJ2GE0R00	0	
	R18 R19	ERJ2GE0R00	0	
	R20	ERJ2GEJ100	10	
	R23	ERJ2GEJ471	470	
	R27	ERJ2GEJ821	820	
	R28	ERJ2GEJ821	820	
	R30	ERJ2GEJ273X	27k	
	R31	ERJ2GE0R00	0	
	R40	ERJ2GEJ103	10k	
	R41	ERJ2GEJ103	10k	
	R42	ERJ2GEJ103	10k	
	R45	ERJ6RSJR10V	0.1	
	R50	ERJ2GEJ332	3.3k	
	R51	ERJ2GEJ471	470	
	R52	ERJ2GEJ471	470	
	R53	ERJ2GEJ332	3.3k	
	R54	ERJ2GEJ103	10k	
	R55	ERJ2GE0R00	0	
	R56	ERJ2GE0R00	0	
ļ	R57	ERJ2GE0R00	0	
	R58	ERJ2GE0R00 ERJ2GEJ101	0	
	R63 R64	ERJ2GEJ101 ERJ2GEJ103	100 10k	
	R66	ERJ2GEJ103	1k	
	R107	ERJ2GEJ221	220	
	R108	ERJ2GEJ221	220	
	R152	ERJ2GE0R00	0	
	R203	D0GA563ZA006		
	R215	ERJ2GE0R00	0	
	R233	ERJ2GEJ102	1k	
	R234	ERJ2GEJ102	1k	
	R235	ERJ2GEJ102	1k	
	R238	ERJ2GEJ102	1k	
	R248	ERJ2GE0R00	0	
	R251	ERJ2GE0R00	0	
	R270	ERJ2GE0R00	0	
	R300	ERJ2GEJ221	220	
	R301	ERJ2GEJ221	220	
	R302	ERJ2GEJ221	220	
	R303	ERJ2GEJ221	220	
	R304	ERJ2GEJ221	220	
	R305	ERJ2GEJ221	220	
	R308	ERJ2GEJ101	100	
	R309	ERJ2GEJ101	100	
ļ	R310	ERJ2GEJ101	100 620	
	R801 R802	ERJ2GEJ621X		
L			270	
1		ERJ2GEJ271	270 11 <sub>2</sub>	
	R803	ERJ2GEJ102	1k	
	R803 R804	ERJ2GEJ102 ERJ2GEJ102	1k 1k	
	R803 R804 R805	ERJ2GEJ102 ERJ2GEJ102 ERJ2GEJ470	1k 1k 47	
	R803 R804 R805 R806	ERJ2GEJ102 ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221	1k 1k 47 220	
	R803 R804 R805 R806 R807	ERJ2GEJ102 ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221	1k 1k 47 220 220	
	R803 R804 R805 R806	ERJ2GEJ102 ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330	1k 1k 47 220	
	R803 R804 R805 R806 R807 L10	ERJ2GEJ102 ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221	1k 1k 47 220 220 33	
	R803 R804 R805 R806 R807 L10	ERJ2GEJ102 ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330	1k 1k 47 220 220 33 33 (CAPACITORS)	
	R803 R804 R805 R806 R807 L10	ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330	1k 1k 47 220 220 33 33 (CAPACITORS)	
	R803 R804 R805 R806 R807 L10 L11	ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330 F2A0J1010090	1k 1k 47 220 220 33 33 (CAPACITORS) 100 330	
	R803 R804 R805 R806 R807 L10 L11 C1	ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330 F2A0J1010090 F2A0J3310067	1k 1k 47 220 220 33 33 (CAPACITORS) 100 330	
	R803 R804 R805 R806 R807 L10 L11 C1 C2 C3	ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330 F2A0J1010090 F2A0J3310067 ECUV1A105KBV	1k 1k 47 220 220 33 33 (CAPACITORS) 100 330 1	
	R803 R804 R805 R806 R807 L10 L11 C1 C2 C3 C11	ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330 F2A0J1010090 F2A0J3310067 ECUV1A105KBV ECUE1A104KBQ	1k 1k 47 220 220 33 33 (CAPACITORS) 100 330 1 0.1	
	R803 R804 R805 R806 R807 L10 L11 C1 C2 C3 C11 C12	ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330 F2A0J1010090 F2A0J3310067 ECUV1A105KBV ECUE1A104KBQ	1k 1k 47 220 220 33 33 (CAPACITORS) 100 330 1 0.1	
	R803 R804 R805 R806 R807 L10 L11 C1 C2 C3 C11 C12 C13	ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330 F2A0J1010090 F2A0J3310067 ECUV1A105KBV ECUE1A104KBQ PQCUV0J106KB	1k 1k 47 220 220 33 33 (CAPACITORS) 100 330 1 0.1 10	
	R803 R804 R805 R806 R807 L10 L11 C1 C2 C3 C11 C12 C13 C15	ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330 F2A0J1010090 F2A0J3310067 ECUV1A105KBV ECUE1A104KBQ PQCUV0J106KB ECUE1A104KBQ	1k 1k 47 220 220 33 33 (CAPACITORS) 100 330 1 0.1 10 0.1 10	
	R803 R804 R805 R806 R807 L10 L11 C1 C2 C3 C11 C12 C13 C15 C40	ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330 F2A0J1010090 F2A0J3310067 ECUV1A105KBV ECUE1A104KBQ PQCUV0J106KB ECUE1A104KBQ ECUV1A105KBV ECUE1A104KBQ	1k 1k 47 220 220 33 33 (CAPACITORS) 100 330 1 0.1 10 0.1 10 0.1 1	
	R803 R804 R805 R806 R807 L10 L11 C1 C2 C3 C11 C12 C13 C15 C40	ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330 F2A0J1010090 F2A0J3310067 ECUV1A105KBV ECUE1A104KBQ PQCUV0J106KB ECUE1A104KBQ ECUV1A105KBV ECUE1A104KBQ	1k 1k 47 220 220 33 33 (CAPACITORS) 100 330 1 0.1 10 0.1 10 0.1 1 10 0.1	
	R803 R804 R805 R806 R807 L10 L11 C1 C2 C3 C11 C12 C13 C15 C40 C43 C44 C45 C46	ERJ2GEJ102 ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330 F2A0J1010090 F2A0J3310067 ECUV1A105KBV ECUE1A104KBQ ECUV1A105KBV ECUE1A104KBQ ECUV1A105KBV ECUE1A104KBQ ECUV1A105KBV ECUE1A104KBQ ECUE1A104KBQ	1k 1k 47 220 220 33 33 (CAPACITORS) 100 330 1 0.1 10 0.1 11 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1	
	R803 R804 R805 R806 R807 L10 L11 C1 C2 C3 C11 C12 C13 C15 C40 C43 C44 C45	ERJ2GEJ102 ERJ2GEJ102 ERJ2GEJ470 ERJ2GEJ221 ERJ2GEJ221 ERJ2GEJ330 ERJ2GEJ330 F2A0J1010090 F2A0J3310067 ECUV1A105KBV ECUE1A104KBQ PQCUV0J106KB ECUE1A104KBQ ECUV1A105KBV ECUE1A104KBQ ECUV1A105KBV	1k 1k 47 220 220 33 33 (CAPACITORS) 100 330 1 0.1 10 0.1 11 0.1 10 0.1 10 0.1 10 0.1 10 0.1 10 0.1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C49	ECUV1A105KBV	1	
	C50	ECUV1A105KBV	1	
	C51	ECUV1A105KBV	1	
	C52	PQCUV0J106KB	10	
	C53	PQCUV0J106KB	10	
	C72	ECUE1H100DCQ	10p	
	C73	ECUE1H100DCQ	10p	
	C80	ECUV1A105KBV	1	
	C96	ECUE1H101JCQ	100p	
	C97	ECUE1H101JCQ	100p	
	C103	ECUE1H101JCQ	100p	
	C104	ECUE1H101JCQ	100p	
	C105	ECUE1H101JCQ	100p	
	C117	ECUE1H100DCQ	10p	
	C118	ECUE1H100DCQ	10p	
	C124	ECUE1H100DCQ	10p	
	C125	ECUE1H100DCQ	10p	
	C147	ECUV1C105KBV	1	
	C172	ECUE1A104KBQ	0.1	
	C173	ECUV1C105KBV	1	
	C174	ECUV1C105KBV	1	
	C175	ECUV1C105KBV		
	C176	ECUV1C105KBV		
	C177	ECUV1C474KBV	0.47	
	C178	ECUV1C474KBV	0.47	
	C179	ECUV1C474KBV	0.47	
	C180	ECUV1C474KBV	0.47	
	C181	ECUV1C474KBV	0.47	
	C182	F1G1H3R3A480	3.3p	
	C183	F1H0J4750002	4.7	
	C184	ECUV1H020CCV	_	S
	C185	ECUV1H020CCV	2p	S
	C801	F1G1H7R0A480	7p	
	C802	F1G1H2R4A480	-	
	C803	F1G1H1R3A480	1.3p	
	C804	F1G1H2R4A480	2.4p	
	C808	ECUE1A104KBQ	0.1	
	C809	ECUE1H100DCQ	10p	
	C810	F1G1H1R6A480	1.6p	
	C811	ECUE1H100DCQ	_	
	C812	F1G1H7R0A480	_	
	C813	F1G1H1R6A480	1.6p	
	C814	ECUE1H332KBQ	0.0033	
	C819	ECUE1H100DCQ	10p	
	C820	F1G1HR75A480	0.75p	
	C822	ECUE1H101JCQ	100p	
	C825	ECUE1H100DCQ	_	
	C826	F1G1H1R5A480		
	C827	ECUE1H100DCQ	•	
	C832	F1G1H7R0A480	_	
	C833	F1G1H7R0A480	_	
	C834	F1G1H1R0A480	1p	
	C837	F1G1HR50A480	_	
	C841	ECUE1H101JCQ	100p	
	C842	ECUE1H101JCQ	_	
			(OTHERS)	
	MIC100	L0CBAY000016		
	E101	L5DZBYY00013	LIQUID CRYSTAL DISPLAY (*3)	
	E102	PQHX11378Z	COVER, LCD COVER SHEET	
	E103	PQHR11195Z	TRANS PARENT PLATE, LCD PLATE	PMMA-H
	E104	PNHR1003Z	GUIDE, LCD	ABS-HB
	E105	PNMC1003Z	MAGNETIC SHIELD, CASE (*4)	
	E106	PQWE10050Z	BATTERY TERMINAL	
		1		i
	X1	H0J103500026	CRYSTAL OSCILLATOR (*2)	

## 15.5.3. Charger Unit

### 15.5.3.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	200	PNLC1001ZB	CHARGER UNIT ASS'Y without NAME PLATE (RTL) (for KX-TGA731EXB)	
	200	PNLC1001YF	CHARGER UNIT ASS'Y without NAME PLATE (RTL) (for KX- TGA731EXF)	
	200	PNLC1001YS	CHARGER UNIT ASS'Y without NAME PLATE (RTL) CHARGER UNIT (RTL) (for KX-TGA731BXS)	
	200-1	PNKM1015Z1	CABINET BODY (for KX-TGA731BXB)	PS-HB
	200-1	PNKM1015Y5	CABINET BODY (for KX- TGA731BXF)	PS-HB
	200-1	PNKM1015Y3	CABINET BODY (for KX- TGA731BXS)	PS-HB
	200-2	PNJT1010Z	CHARGE TERMINAL	
	200-3	PNKF1012Z1	CABINET COVER (for KX- TGA731BXB)	ABS-HB
	200-3	PNKF1012Z4	CABINET COVER (for KX-TGA731BXF)	ABS-HB
	200-3	PNKF1012Z2	CABINET COVER (for KX-TGA731BXS)	ABS-HB
	200-4	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	
	201	PNGT1359Z	NAME PLATE (for KX- TGA731BXB)	
	201	PNGT1360X	NAME PLATE (for KX-TGA731BXF)	
	201	PNGT1360Y	NAME PLATE (for KX- TGA731BXS)	

### 15.5.3.2. Main P.C.Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB200	PQWPTGA721CH	MAIN P.C.BOARD ASS'Y (RTL)	
			(DIODE)	
	D1	B0JAME000095	DIODE(SI)	
			(JACK)	
	J1	K2ECYB000001	JACK	S
			(RESISTOR)	
	R1	ERG2SJ100E	10	
			(FUSE)	
	F1	K5H302Y00003	FUSE	

# 15.5.4. Accessories and Packing Materials

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

### 15.5.4.1. KX-TG7331BXM/BXT

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
Δ	A1	PQLV207BXU	AC ADAPTOR	
	A2	PQJA10075Z	CORD, TELEPHONE	S
	A3	PNQX1230Z	INSTRUCTION BOOK (*1) (for English)	
	A4	PNQW1175Z	LEAFLET, QUICK GUIDE (for Arabic)	
	A5	PNQW1176Z	LEAFLET, QUICK GUIDE (for Persian)	
	P1	PQPP10152Z	PROTECTION COVER (for Base Unit)	
	P2	XZB08X25B02	PROTECTION COVER (for Handset)	

### KX-TG7331BX//KX-TGA731BX

Safety	Ref.	Part No.	Part Name & Description	Remarks
	No.			
	P3	PNPK1595Z	GIFT BOX	

### 15.5.4.2. KX-TGA731BXB/BXF/BXS

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	A101	PQLV209BXU	AC ADAPTOR	
	A102	PNQX1170Z	INSTRUCTION BOOK (for English) (*1)	
	A103	PNQX1171Z	INSTRUCTION BOOK (for Arabic) (*1)	
	A104	PNQX1172Z	INSTRUCTION BOOK (for Persian) (*1)	
	P101	XZB08X25B02	PROTECTION COVER (for Handset)	
	P102	XZB13X19C03	PROTECTION COVER (for Charger Unit)	
	P103	PNPK1576Z	GIFT BOX	

### 15.5.5. Screws

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

## 15.5.6. Fixtures and Tools

### Note:

- (\*1) See The Setting Method of JIG (Base Unit) (P.57), and The Setting Method of JIG (Handset) (P.61).
- (\*2) When replacing the Handset LCD, See **How to** Replace the Handset LCD (P.56).

Safety	Ref. No.	Part No.	Part Name & Description Remarks
		PQZZ1CD300E	JIG CABLE (*1)
		PQZZTG7331BX	BATCH FILE CD-ROM (*1)
		PQZZ430PIR	TIP OF SOLDERING IRON (*2)
		PQZZ430PRB	RUBBER OF SOLDERING IRON (*2)

K.O KXTG7331BXM KXTG7331BXT KXTGA731BXM KXTGA731BXB KXTGA731BXB KXTGA731BXF KXTGA731BXS