

Service Manual

Telephone Equipment

Caller ID Compatible

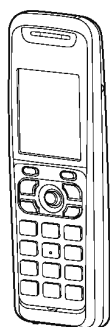
Model No. **KX-TG7411MEB**

KX-TG7412MEB

KX-TGA740MEB

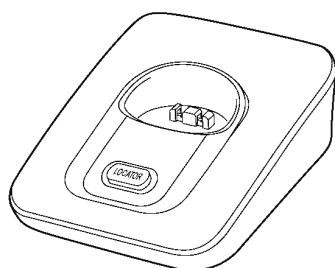
Expandable Digital Cordless Phone

B: Black Version
(for Mexico)

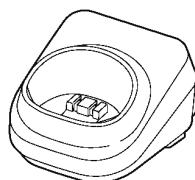


KX-TGA740MEB
(Handset)

DECT
6.0



KX-TG7411MEB
(Base Unit)



(Charger Unit)

Configuration for each model

Model No	Base Unit	Handset	Charger Unit	Expandable
KX-TG7411	1 (TG7411)	1 (TGA740)		Up to 6
KX-TG7412	1 (TG7411)	2 (TGA740)	1	Up to 6
KX-TGA740		1 (TGA740)	1	

* KX-TGA740 is also an optional accessory, which contains a handset and a charger.

* For the optional accessory (KX-TGA644), refer to KX-TG6411/6412/6413ME service manual.

 WARNING

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

IMPORTANT SAFETY NOTICE

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

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

If lead free solder was used in the manufacture of this product, the printed circuit boards will be marked PbF. Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.

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

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

Note for TABLE OF CONTENTS:

Because sections 5, 6 and 7 of this manual are extracts 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 manufacturer's Instructions.

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

Note:

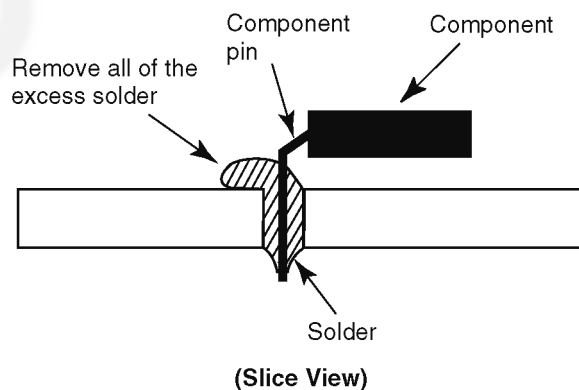
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

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

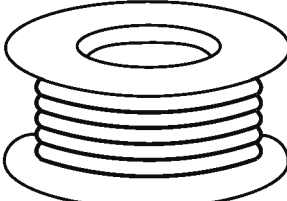
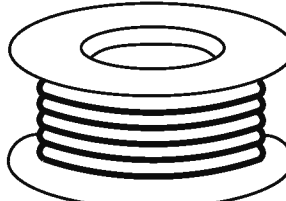
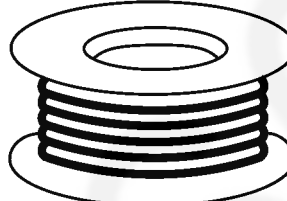
- PbF solder has a melting point that is 50 °F ~ 70 °F (30 °C ~ 40 °C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700 °F ± 20 °F (370 °C ± 10 °C).
- Exercise care while using higher temperature soldering irons.:
Do not heat the PCB for too long time in 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.

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

2.3. Discarding of P. C. Board

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

3 Specifications

■Standard:

DECT 6.0 (Digital Enhanced Cordless
Telecommunications 6.0)

■Number of channels:

120 Duplex Channels

■Frequency range:

1.91 GHz to 1.93 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:

115 mW (max.)

■Voice coding:

ADPCM 32 kbit/s

	Base Unit	Handset	Charger
Power source	AC Adaptor (PQLV219Z, 120 V AC, 60 Hz)	Rechargeable Ni-MH battery AAA (R03) size (1.2 V 630 mAh)	AC Adaptor (PQLV219Z, 120 V AC, 60 Hz)
Receiving Method	Super Heterodyne	Super Heterodyne	—
Oscillation Method	PLL synthesizer	PLL synthesizer	—
Detecting Method	Quadrature Discriminator	Quadrature Discriminator	—
Tolerance of OSC Frequency	13.824 MHz ±100 Hz	13.824 MHz ±100 Hz	—
Modulation Method	Frequency Modulation	Frequency Modulation	—
ID Code	40 bit	40 bit	—
Ringer Equivalence No. (REN)	0.1	—	—
Dialing Mode	—	Tone (DTMF)/Pulse	—
Redial	—	Up to 48 digits	—
Speed Dialer	—	Up to 32 digits (Phonebook)	—
Power Consumption	Standby: Approx. 1.1 W Maximum: Approx. 4.4 W	11 days at Standby, 5 hours at Talk	Standby: Approx. 0.1 W, Maximum: Approx. 2.6 W
Operating Conditions	0 °C - 40 °C 20 % – 80 % relative air humidity (dry)	0 °C - 40 °C 20 % – 80 % relative air humidity (dry)	0 °C - 40 °C 20 % – 80 % relative air humidity (dry)
Dimensions (H x W x D)	Approx. 52 mm x 98 mm x 150 mm	Approx. 159 mm x 48 mm x 32 mm	Approx. 51 mm x 75 mm x 88 mm
Mass (Weight)	Approx. 160 g	Approx. 130 g	Approx. 60 g

Note:

- Design and specifications are subject to change without notice.

Note for Service:

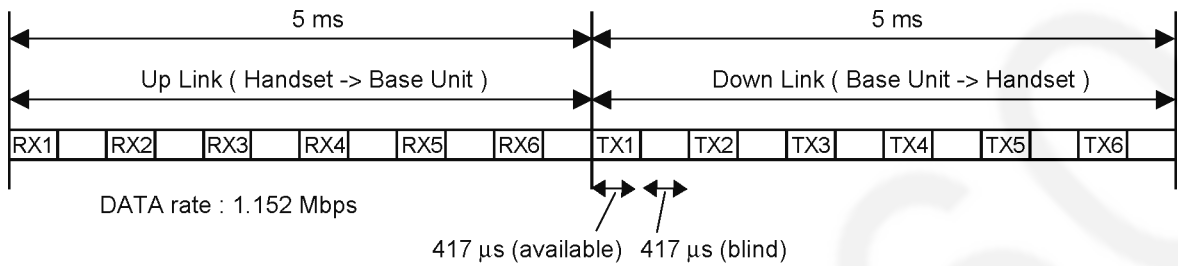
- Operation range: Up to 300 m outdoors, Up to 50 m indoors, depending on the condition.
- Analog telephone connection: Telephone Line

4 Technical Descriptions

4.1. US-DECT Description

The frequency range of 1.91 GHz-1.93 GHz is used. Transmitting and receiving carrier between base unit and handset is same frequency. Refer to **Frequency Table** (P.65).

4.1.1. TDD Frame Format

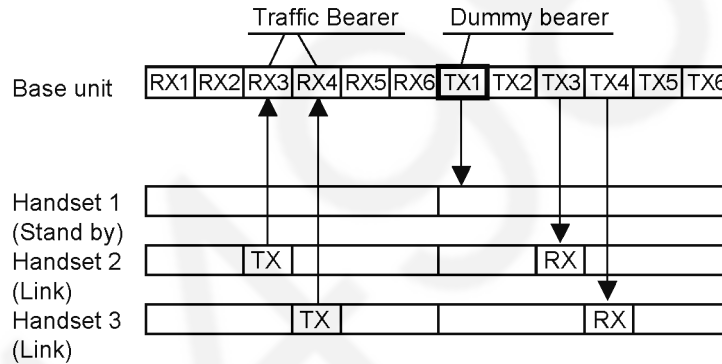


4.1.2. TDMA system

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

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

• 2 - Handsets Link



Traffic Bearer

A link is established between base unit and handset.

The state where duplex communication is performed.

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

Dummy Bearer

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

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

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

Note:

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

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

4.1.3. Signal Flowchart in the Radio Parts

Reception

A voice signal from TEL line is encoded to digital data "TXDATA" by DSP (IC501) in a base unit.
Then TXDATA goes to RF PART, and it's modulated to 1.9 GHz. The RF signal is amplified and fed to a selected antenna.

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

RFIC (IC701) compares RF signal levels and selects the antenna to be used. Then RFIC down-converts to 864 kHz IF signal from RX signal in the selected antenna, and demodulates it to digital data "RXDATA".

DSP (IC501) converts RXDATA into a voice signal and outputs it to speaker.

Transmission

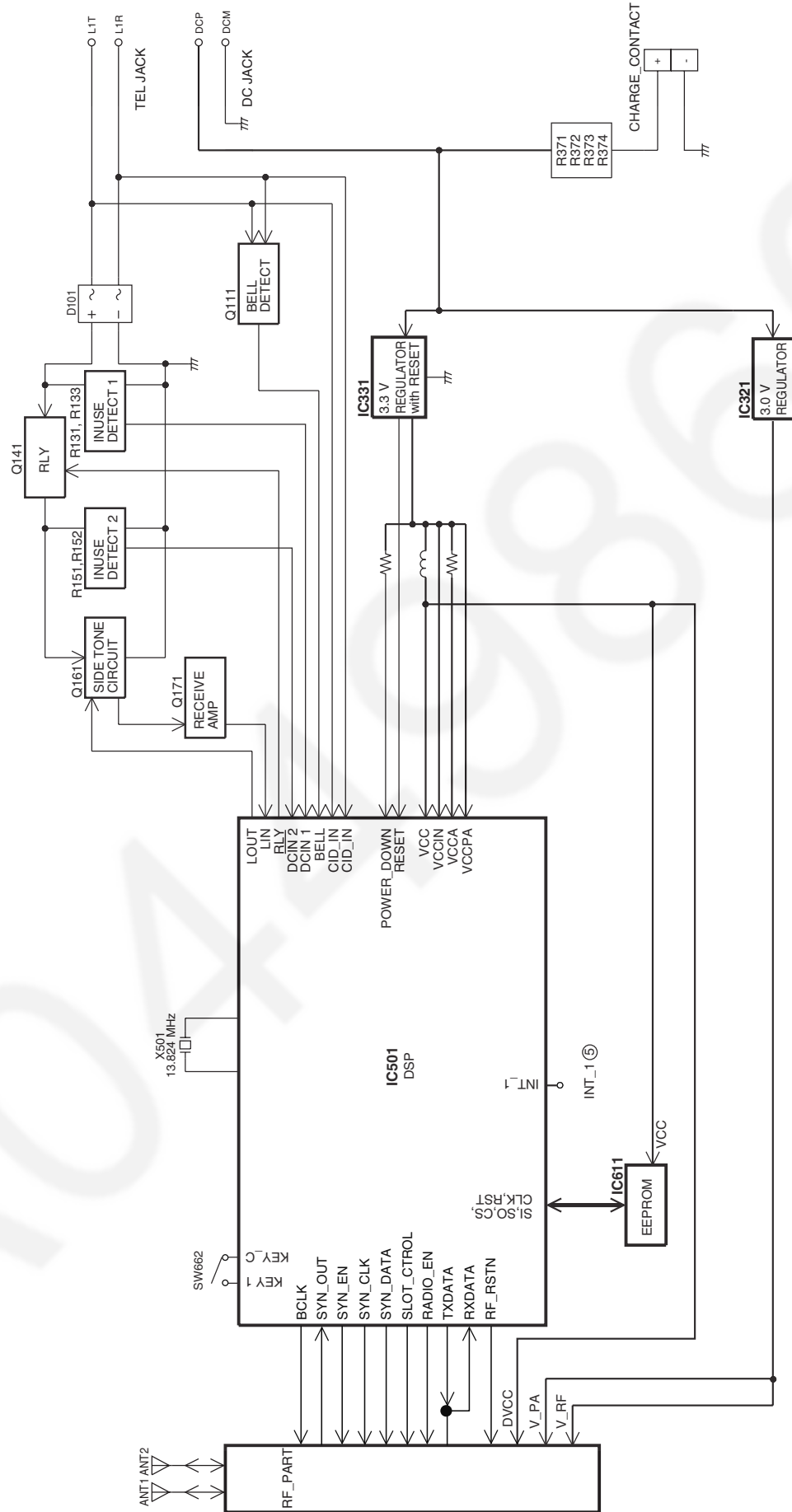
A voice signal from microphone is encoded to digital data "TXDATA" by DSP (IC501) in a handset.
Then TXDATA goes to RF PART, and it's modulated to 1.9 GHz. The RF signal is amplified and fed to a selected antenna.

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

RFIC (IC701) compares RF signal levels and selects the antenna to be used. Then RFIC down-converts to 864 kHz IF signal from RX signal in the selected antenna, and demodulates it to digital data "RXDATA".

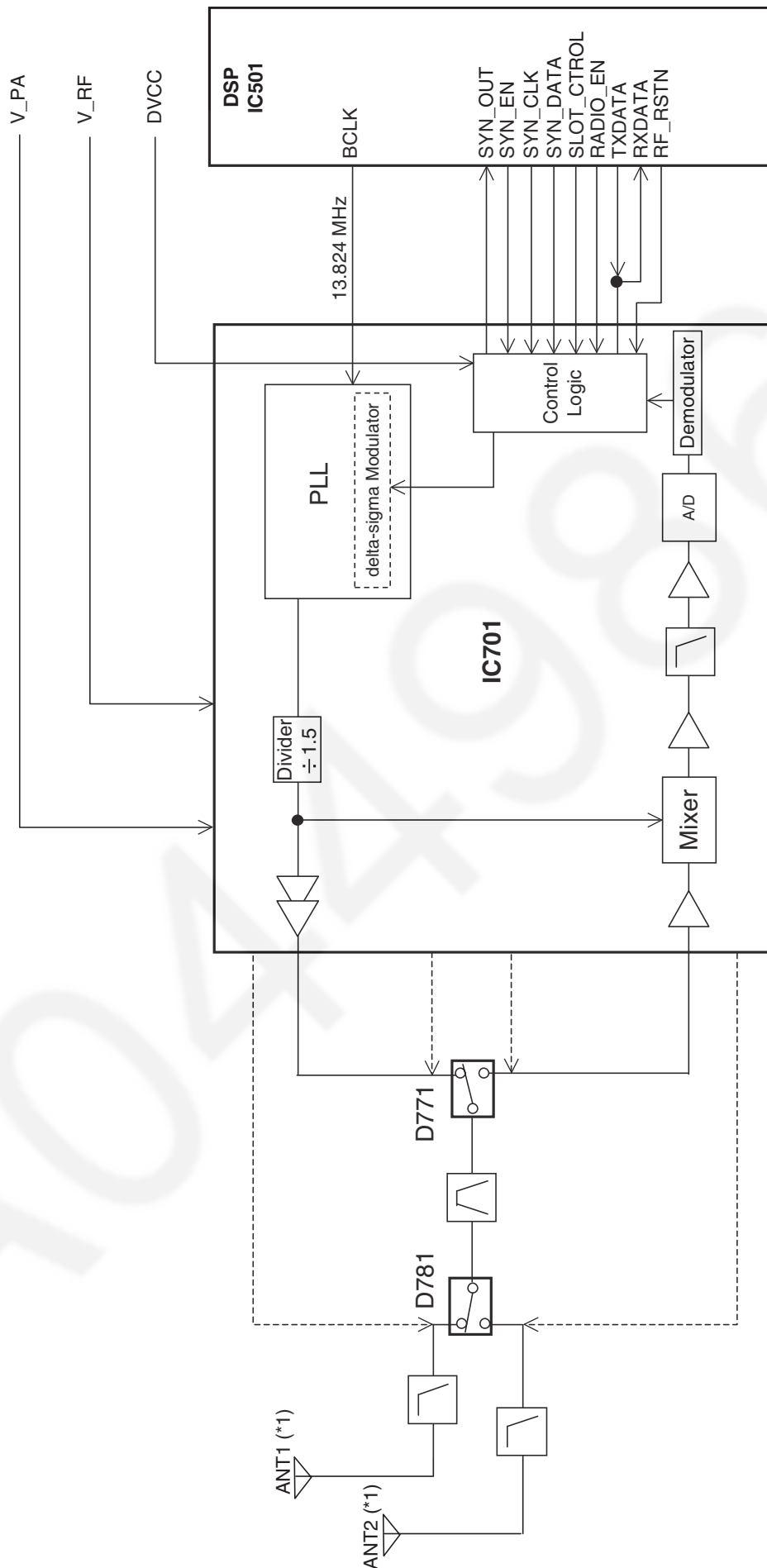
DSP (IC501) converts RXDATA into a voice signal and outputs it to TEL line.

4.2. Block Diagram (Base Unit_Main)



KX-TG7411/7412 BLOCK DIAGRAM (Base Unit_Main)

4.3. Block Diagram (Base Unit_RF Part)



KX-TG7411/7412 BLOCK DIAGRAM (Base Unit_RF Part)

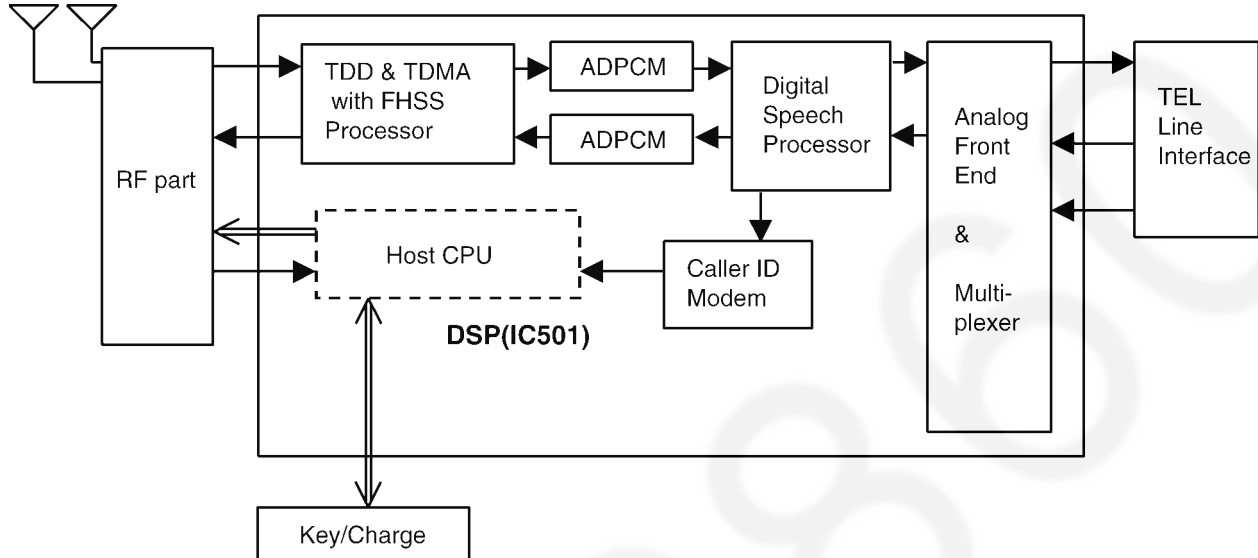
Note:
(*1) Antenna Type: wired dipole antenna

4.4. Circuit Operation (Base Unit)

General Description:

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

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



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

- **DTMF Generator**

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

- **Caller ID demodulation**

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

- **Digital Switching**

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

- **Block Interface Circuit**

RF part, LED, Key scan, Telephone line.

4.4.2. EEPROM (IC611)

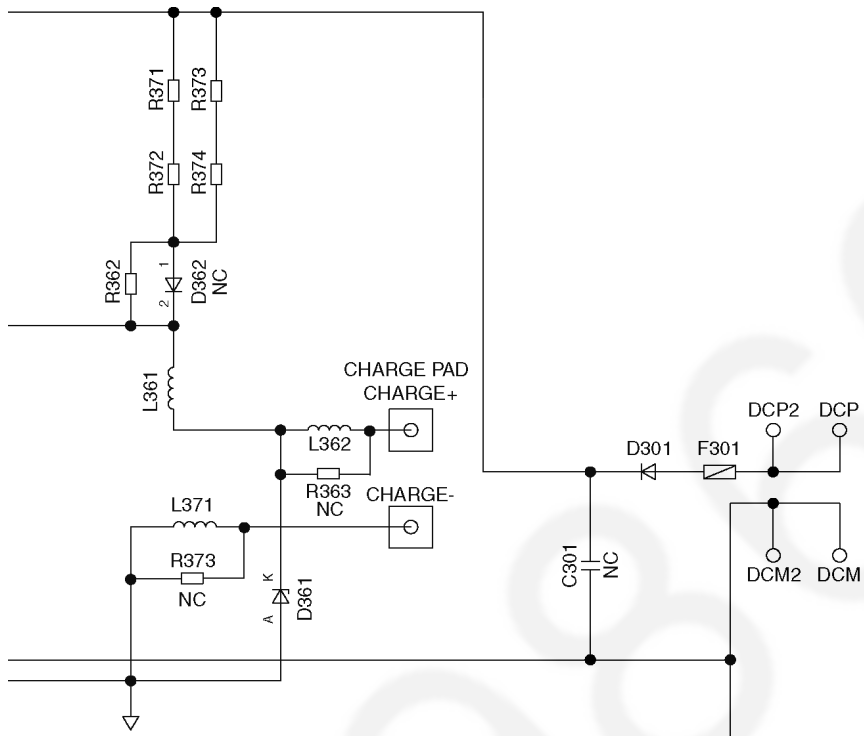
Following information data is stored.

- **Settings**

ex: ID code, Flash Time, Tone/Pulse

4.4.3.1. Charge Circuit

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



4.4.4. Reset Circuit

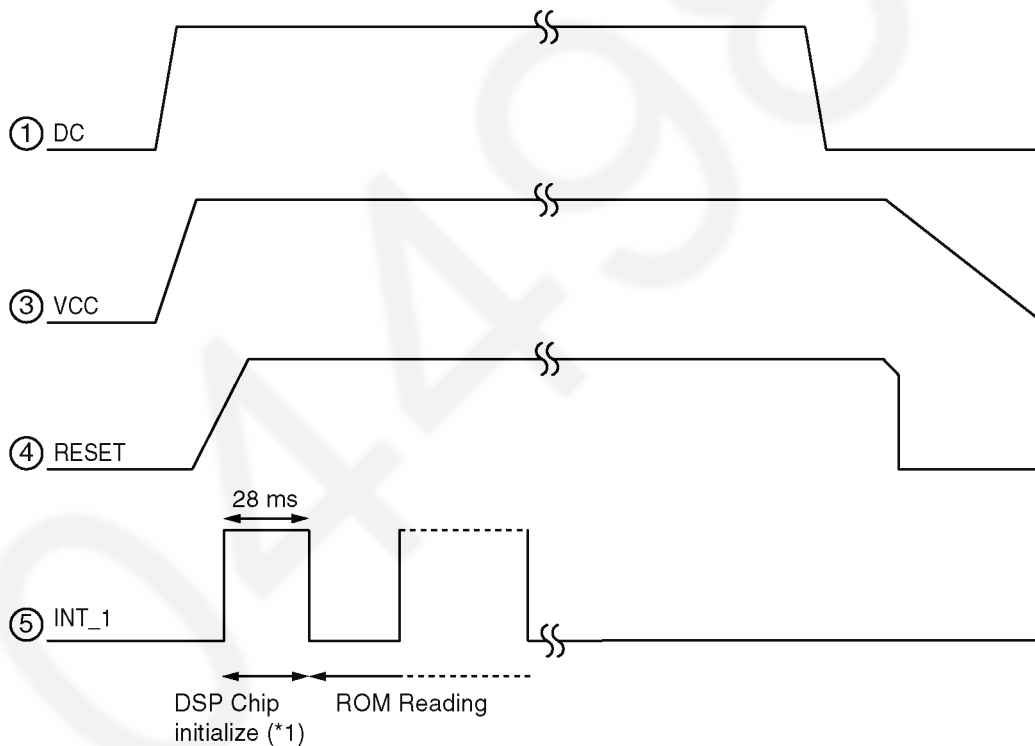
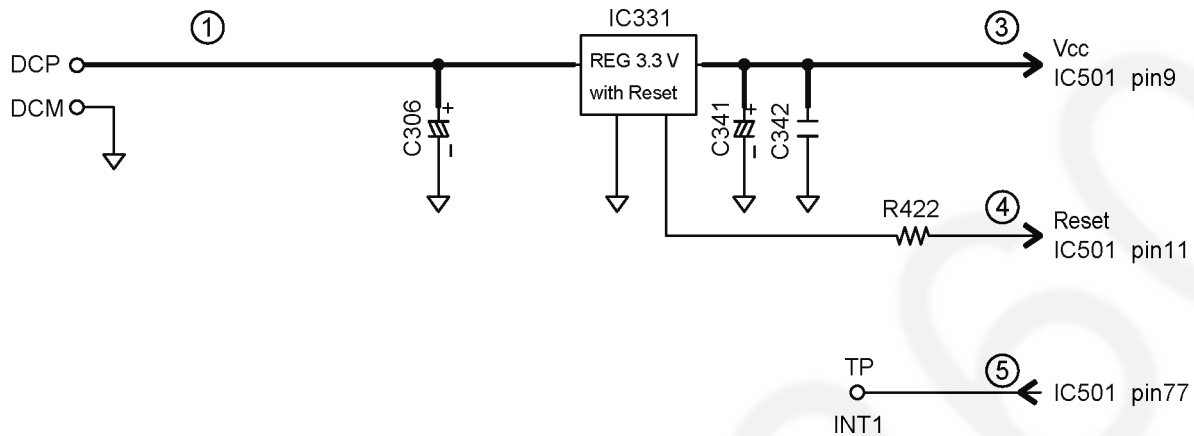
Function:

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

Circuit Operation:

When the AC Adaptor is inserted into the unit, then the voltage is shifted by IC331 and power is supplied to the DSP.

The set starts to operate when VCC goes up to 3.0 V or more in the circuit voltage diagram.



Note:

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

4.4.5. Telephone Line Interface

Telephone Line Interface Circuit:

Function

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

Bell signal detection and OFF HOOK circuit:

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

T → L101 → R111 → C111 → Q111 → DSP pin 58 [BELL]

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

T → L101 → D101 → Q141 → Q161 → R163 → R167 → D101 → L102 → P101 → R

ON HOOK Circuit:

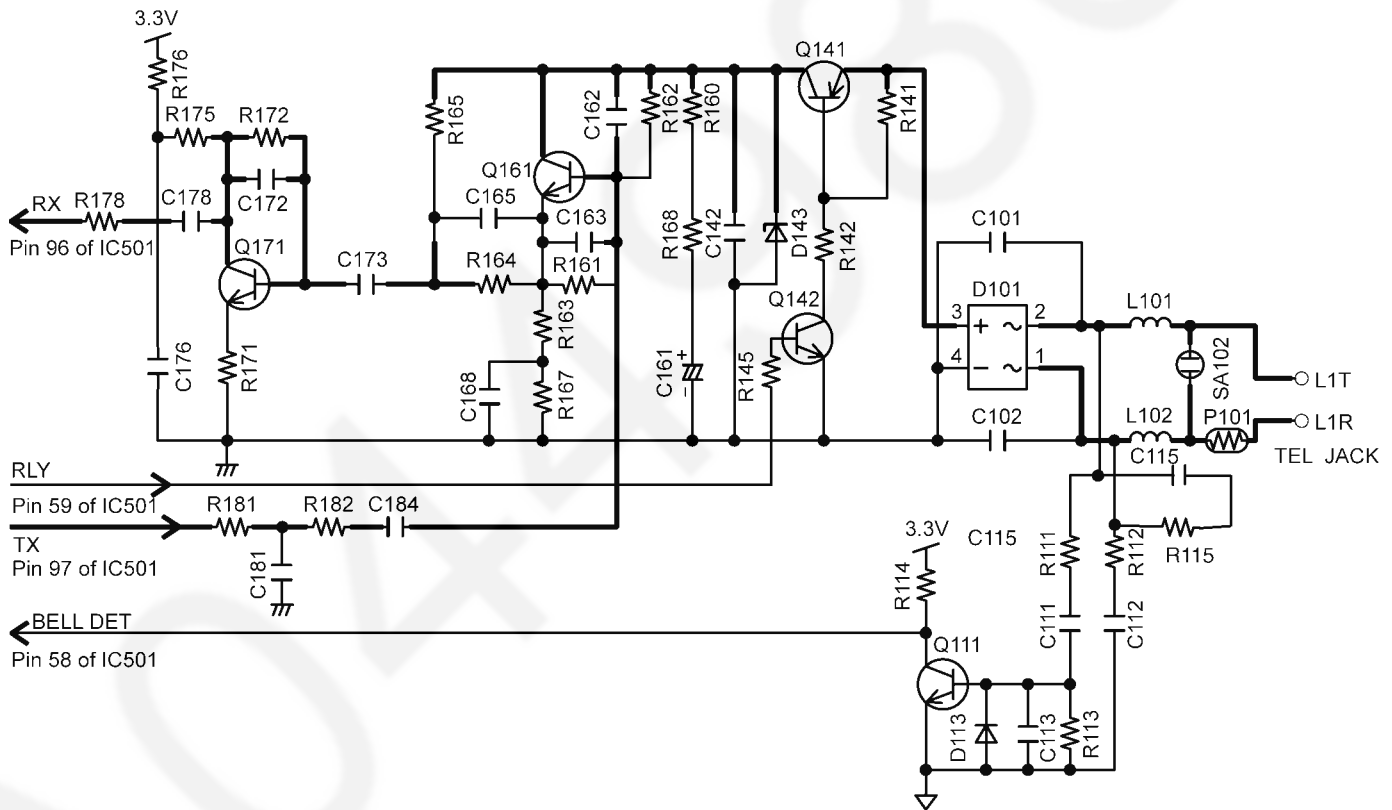
Q141 is open, Q141 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

Pulse Dial Circuit:

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

Side Tone Circuit:

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



4.4.6. Parallel Connection Detect Circuit

Function:

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

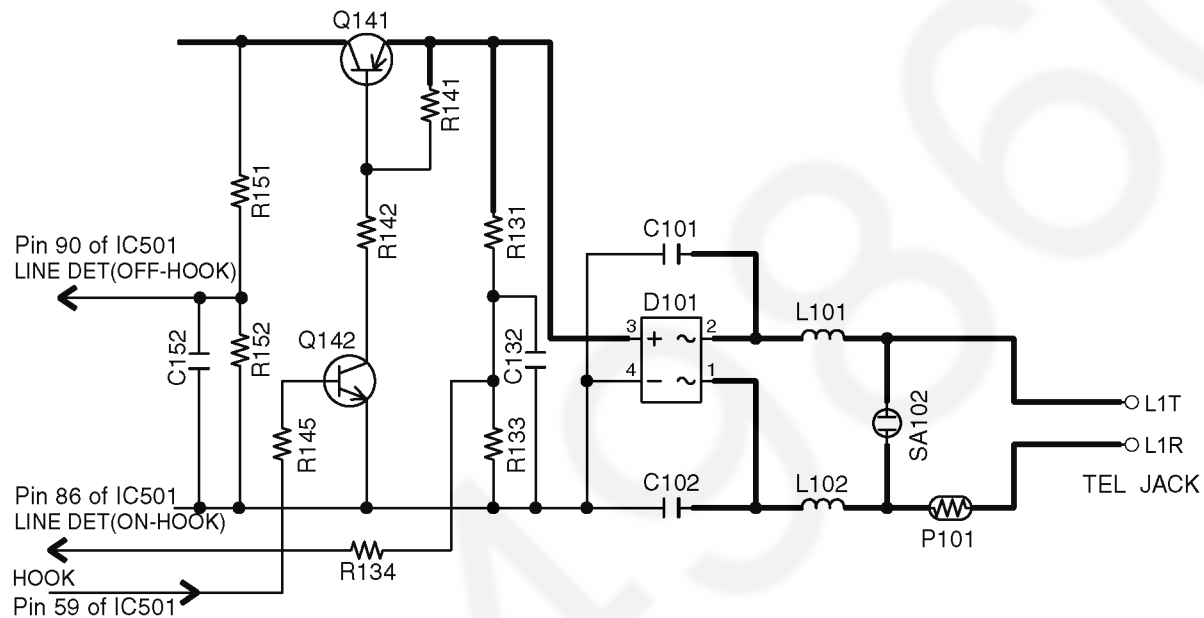
Circuit Operation:

Parallel connection detection when on hook:

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

Parallel connection detection when off hook:

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



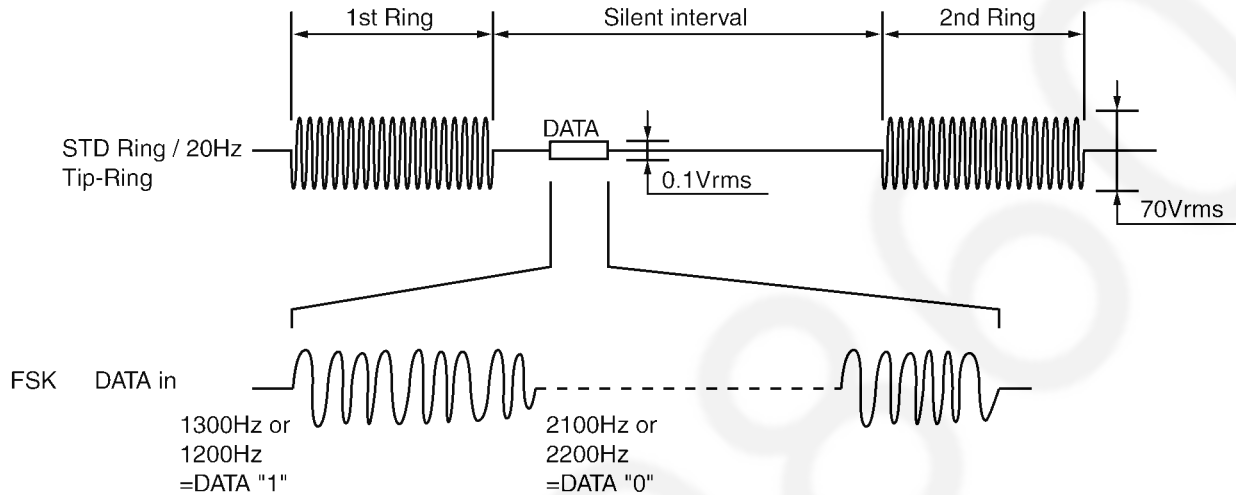
4.4.7. Calling Line Identification (Caller ID)/Call Waiting Caller ID

Function:

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

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

- FSK (Frequency Shift Keying) format

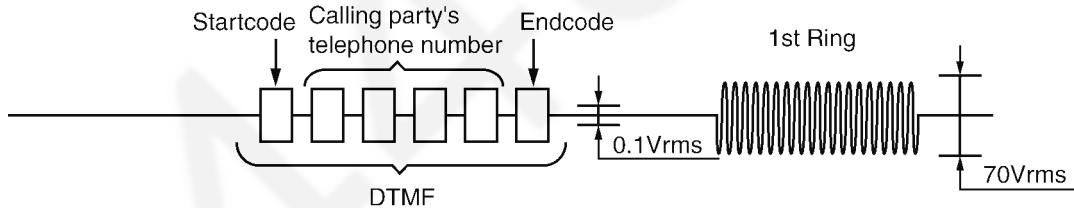


- DTMF format

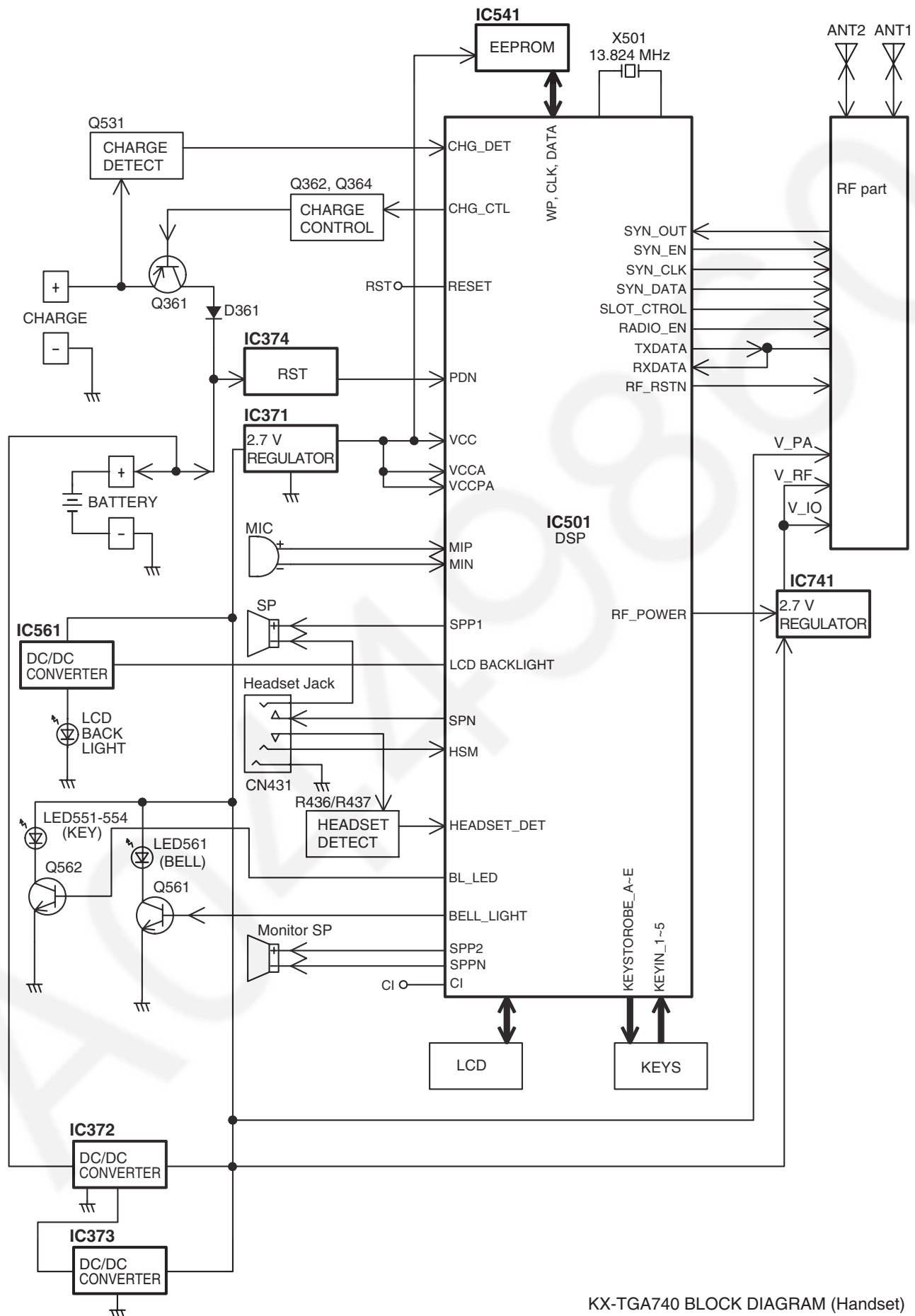
It is the method to send the telephone number of calling party with DTMF to the telephone. DTMF is sent before the first bell signal.

The data is sent in turn; first the start code, secondly the telephone number of calling party, lastly end code.

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

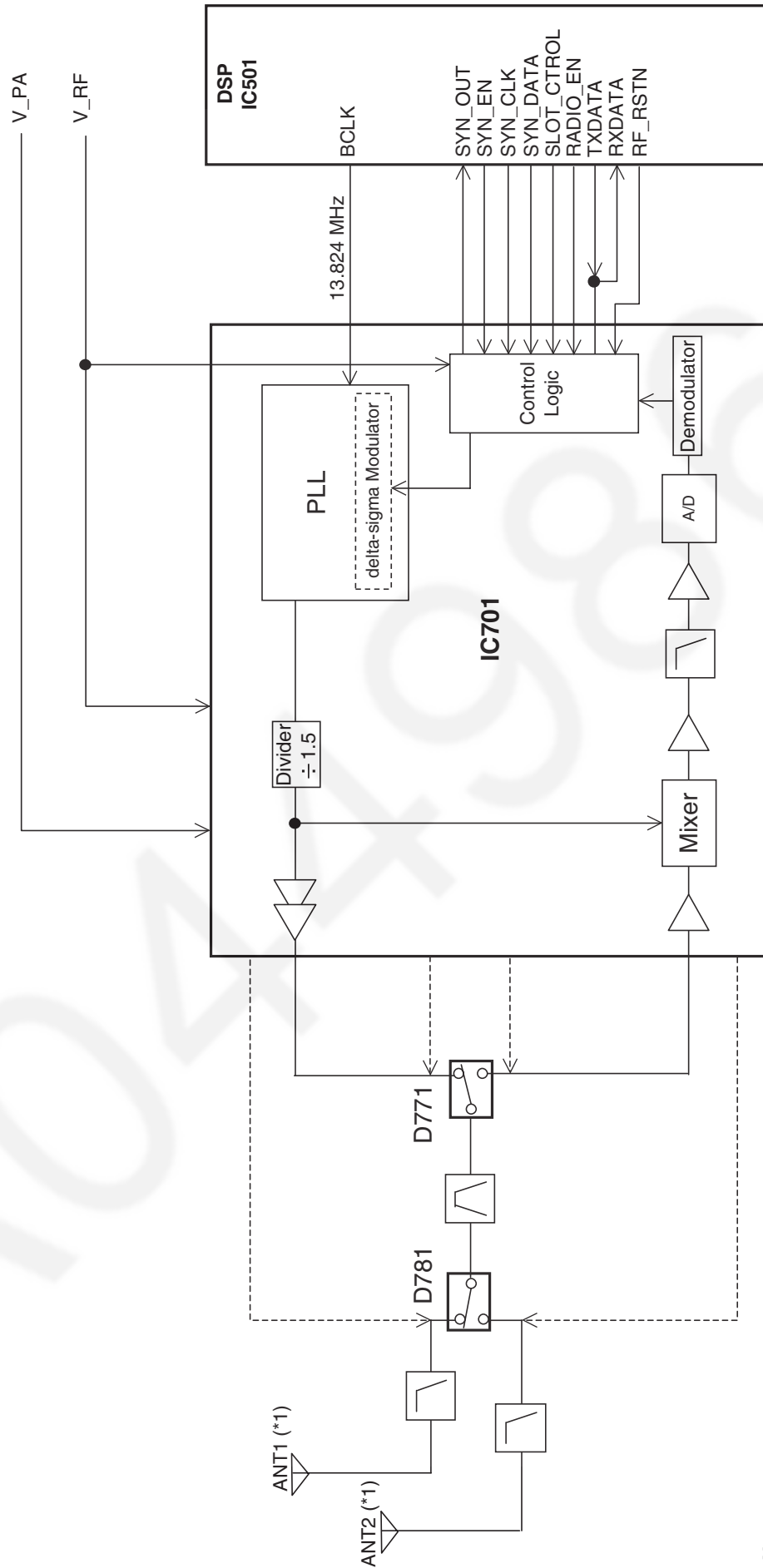


4.5. Block Diagram (Handset)



KX-TGA740 BLOCK DIAGRAM (Handset)

4.6. Block Diagram (Handset_RF Part)



KX-TGA740 BLOCK DIAGRAM (Handset_RF Part)

Note:

(*1) Antenna Type (difference between base unit and handset in Radio parts)

ANT1: patterned antenna

ANT2: wired dipole antenna

4.7. Circuit Operation (Handset)

4.7.1. Construction

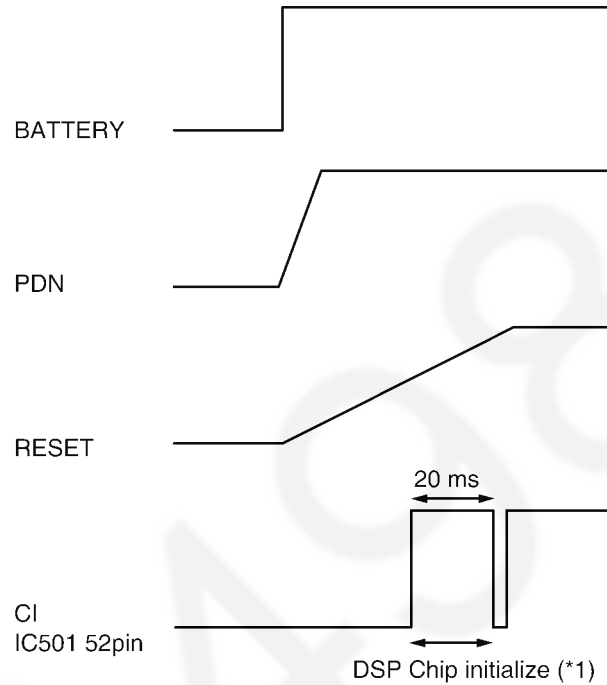
The circuit mainly consists of DSP and RF part as shown in the block diagram.

4.7.1.1. DSP: IC501

Function

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

Initial waves



Note:

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

4.7.1.2. RF part

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

4.7.1.3. EEPROM: IC541

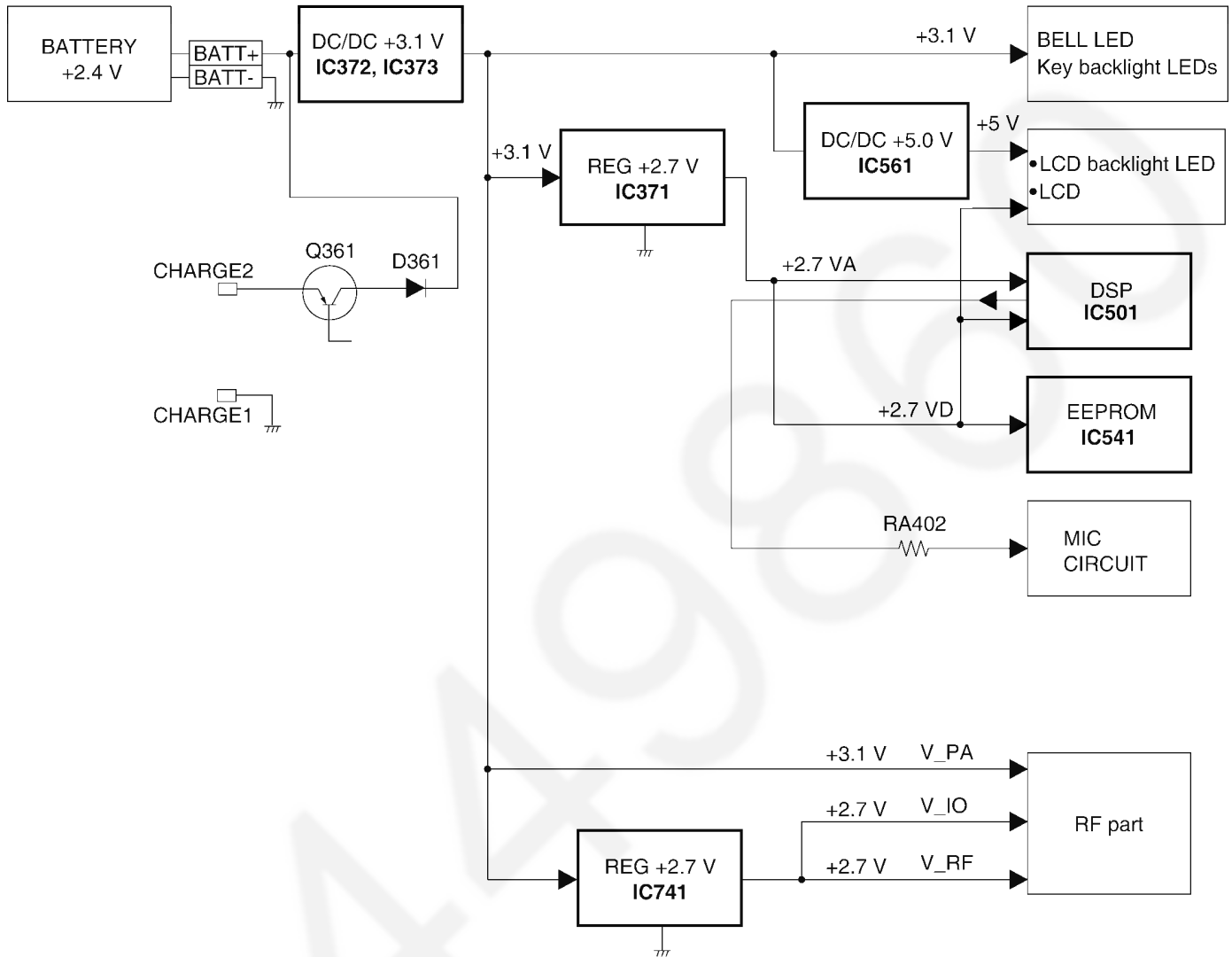
Setting data is stored.

ex: ID code, user setting

4.7.2. Power Supply Circuit

Voltage is supplied separately to each block.

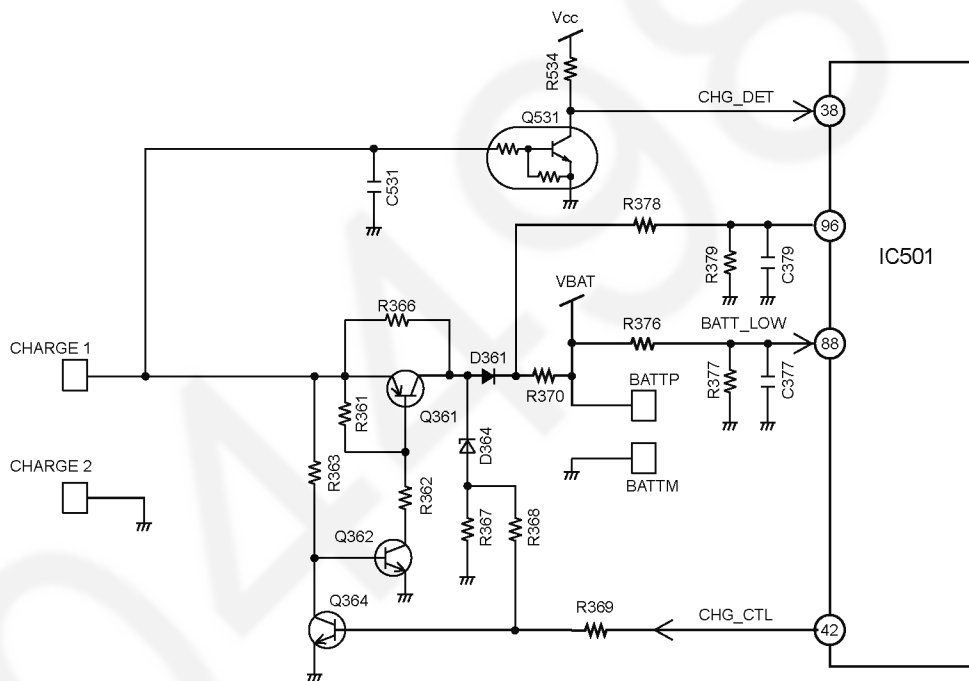
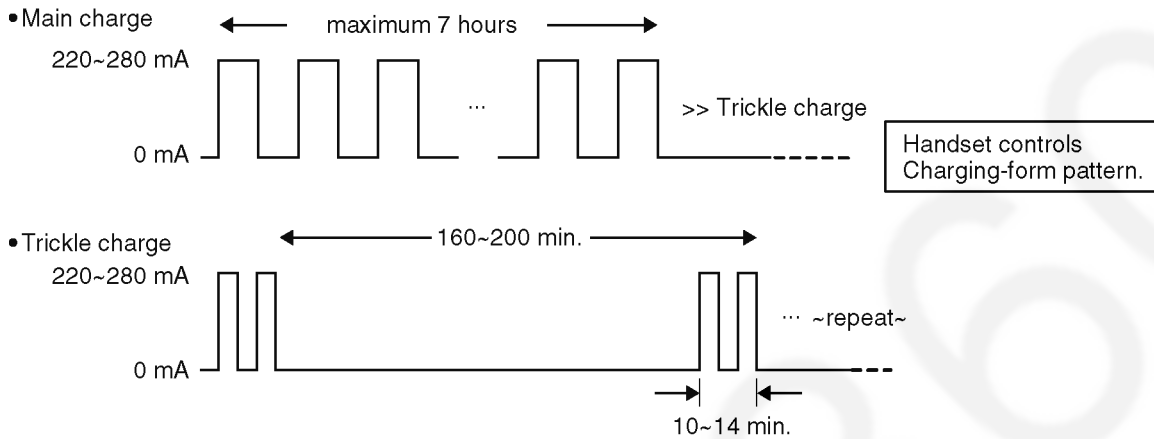
Block Diagram (Handset Power)



4.7.3. Charge Circuit

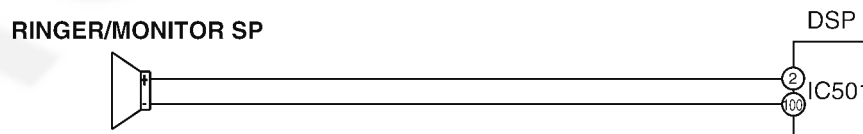
When the handset is put on the cradle of the base unit, the power is supplied from CHARGE+ and CHARGE- terminals to charge the battery via R366 or Q361. The voltage between CHARGE+ and CHARGE- flows Q531 → pin 38 of IC501, where the charge is detected. Then IC501 calculates the battery consumption amount from the previous charge, and it controls Q361/Q362/Q364 by pin 42 of IC501 until charging is complete. When charging is complete, the control pattern is switched to Trickle charging form from Operational charging form.

Charging form



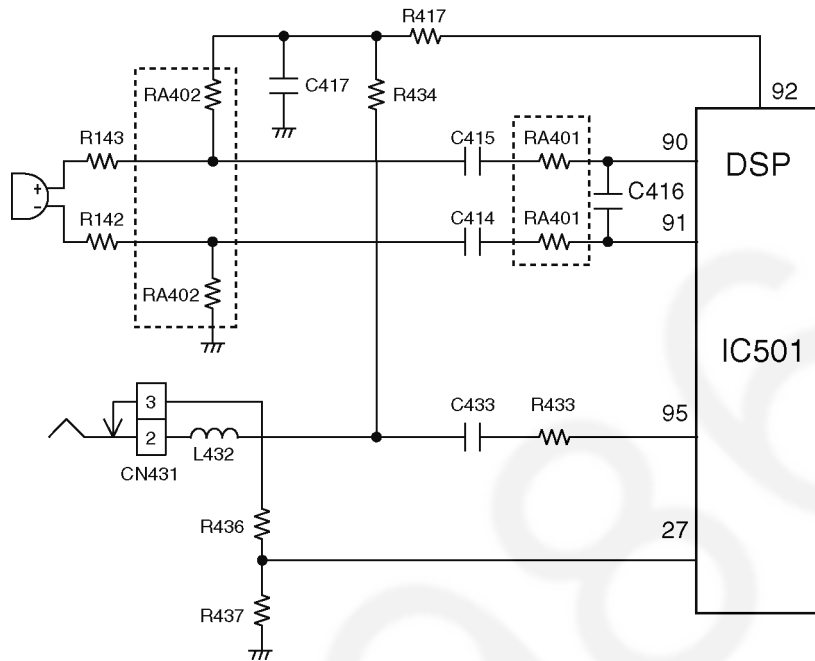
Pin 88 of IC501 monitors the battery voltage and detect BATT LOW at 2.34 V.

4.7.4. Ringer and Handset SP-Phone



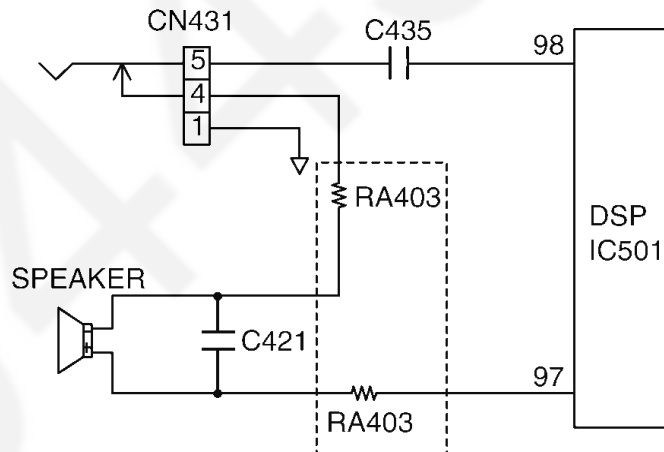
4.7.5. Sending Signal

The voice signal from the microphone is input to DSP (90, 91). CN431 is the headset jack. When the headphone is connected, the R436/R437 detects it. The input from the microphone of the handset (MIM, MIP) is cut and the microphone signal from the headset is input to DSP (95). Also the power for the microphone is supplied from DSP (92) and the power is turned OFF on standby.



4.7.6. Reception Signal

The voice signal from the base unit is output to DSP (98). This signal is led to the headset jack (CN431). The signal through the headset jack and the other signal output from DSP (97) drives the speaker. When the headset is inserted to the jack, the voice signal is cut at the jack, so the sound does not come out from the speaker, but from the headset only.



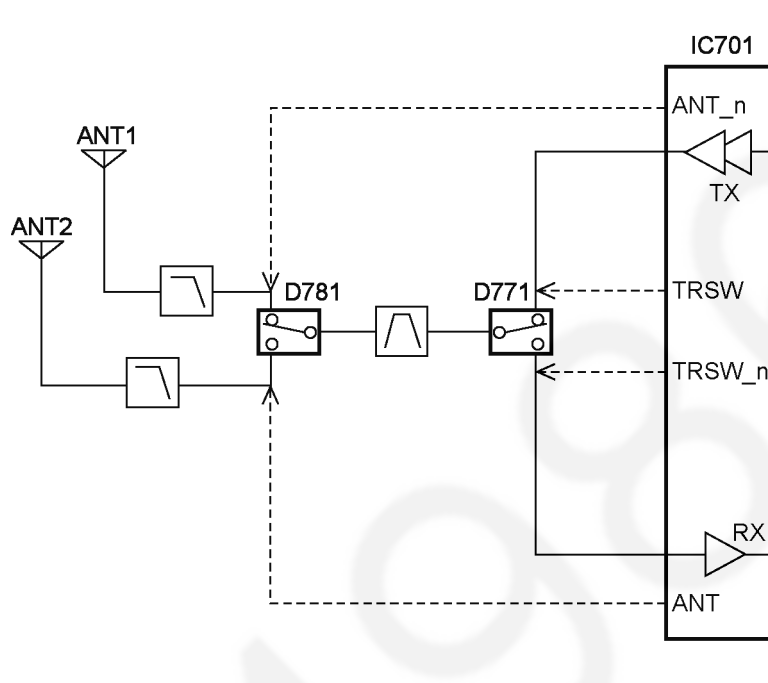
4.8. Circuit Operation (RF Part)

General Description:

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

4.8.1. Antenna-switch Circuit

IC701 controls D771 by TRSW/TRSW_n signals and carries out the switching of TX-mode/RX-mode. In the same way, IC701 controls D781 by ANT/ANT_n signals and carries out the switching of Antenna1 (ANT1)/Antenna2 (ANT2).



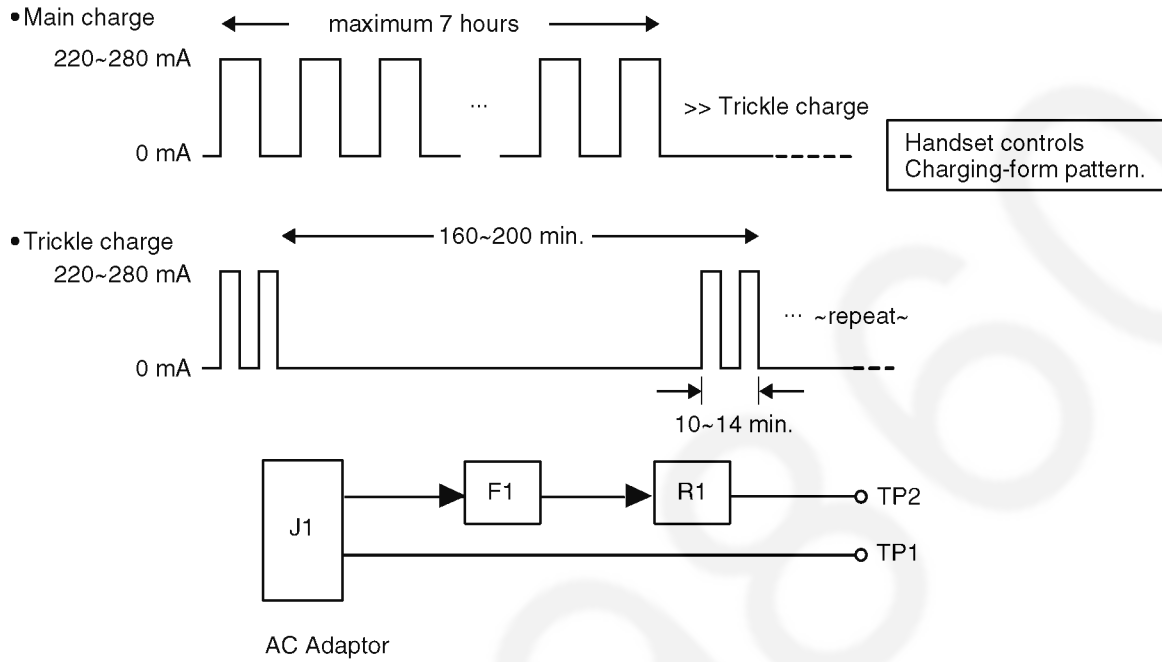
D771Control (TX/RX switch)		TRSW	
		High	Low
TRSW_n	High	---	RX-mode
	Low	TX-mode	---

D781Control (Antenna switch)		ANT	
		High	Low
ANT_n	High	---	ANT1
	Low	ANT2	---

4.9. Circuit Operation (Charger Unit)

The voltage from the AC adaptor is supplied to the charge circuits. Main charge (220~280 mA at the Battery) of maximum 7-hours is started soon after the handset is placed on the charger unit. Then it changes to Trickle charge to prevent from over-charging.

Charging form



The route for this is as follows: DC+pin of J1(+) → F1 → R1 → CHARGE+pad → Handset → CHARGE-pad → DC-pin of J1(-).

4.10. Signal Route

SIGNAL ROUTE	IN	→	ROUTE	→	OUT
HANDSET TX	HANDSET MIC - R412/R413 - C414/C415 - RA401 - IC501(91/90 - 20) - <HANDSET_RF_TX_ROUTE> - ANT. --- ---ANT. - <BASE_UNIT_RF_RX_ROUTE> - IC501(34 - 97) - R181 - R182 - C184 - Q161 - Q141 - D101 - L101/[L102 - P101] - T/R(TEL LINE)				
HANDSET RX	T/R(TEL LINE) - L101/[P101 - L102] - D101 - Q141 - R165 - C173 - Q171 - C178 - R178 - IC501(96 - 18) - <BASE_UNIT_RF_TX_ROUTE> - ANT. --- --- ANT. - <HANDSET_RF_RX_ROUTE> - IC501(36 - 98/97) - [C435 - L434 - HEADSET_JACK(5 - 4) - RA403]/RA403 - HANDSET SPEAKER				
HEADSET TX	HEADSET_JACK(2) - C433 - R433 - IC501(95 - 20) - <HANDSET_RF_TX_ROUTE> - ANT. --- ---ANT. - <BASE_UNIT_RF_RX_ROUTE> - IC501(34 - 97) - R181 - R182 - C184 - Q161 - Q141 - D101 - L101/[L102 - P101] - T/R(TEL LINE)				
HEADSET RX	T/R(TEL LINE) - L101/[P101 - L102] - D101 - Q141 - R165 - C173 - Q171 - C178 - R178 - IC501(96 - 18) - <BASE_UNIT_RF_TX_ROUTE> - ANT. --- --- ANT. - <HANDSET_RF_RX_ROUTE> - IC501(36 - 98) - C435 - L434 - HEADSET_JACK(5)				
HANDSET SP-Phone TX	HANDSET MIC - R412/R413 - C414/C415 - RA401 - IC501(91/90 - 20) - <HANDSET_RF_TX_ROUTE> - ANT. --- ---ANT. - <BASE_UNIT_RF_RX_ROUTE> - IC501(34 - 97) - R181 - R182 - C184 - Q161 - Q141 - D101 - L101/[L102 - P101] - T/R(TEL LINE)				
HANDSET SP-Phone RX	T/R(TEL LINE) - L101/[P101 - L102] - D101 - Q141 - R165 - C173 - Q171 - C178 - R178 - IC501(96 - 18) - <BASE_UNIT_RF_TX_ROUTE> - ANT. --- --- ANT. - <HANDSET_RF_RX_ROUTE> - IC501(36 - 2/100) - MONITOR SP				
DTMF SIGNAL TO TEL LINE	IC501(97) - R181 - R182 - C184 - Q161 - Q141 - D101 - L101/[L102 - P101] - T/R(TEL LINE)				
CALLER ID	T/R(TEL LINE) - L101/[P101 - L102] - C121/C122 - R121/R122 - IC501(89/88)				
BELL DETECTION	T/R(TEL LINE) - L101/[P101 - L102] - R111/R112 - C111/C112 - Q111 - IC501(58)				

Note:

 : inside of Handset

RF part signal route

SIGNAL ROUTE	IN	→	ROUTE	→	OUT
HANDSET RF [TX_ROUTE]	R736 - IC701(20 - 9/10) - L751/C751 - C765 - L754 - D771 - C776 - D781 - L795/L791 - C797/C793 - ANT1/ANT2				
HANDSET RF [RX_ROUTE]	ANT1/ANT2 - C797/C793 - L795/L791 - D781 - C776 - D771 - C773 - IC701(7/8 - 20)				
BASE UNIT RF [TX_ROUTE]	R736 - IC701(20 - 9/10) - L751/C751 - C765 - L754 - D771 - C776 - D781 - L795/L791 - C797/C793 - ANT1/ANT2				
BASE UNIT RF [RX_ROUTE]	ANT1/ANT2 - C797/C793 - L795/L791 - D781 - C776 - D771 - C773 - IC701(7/8 - 20)				

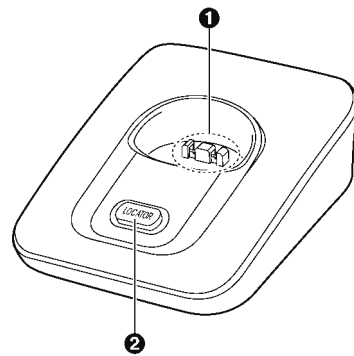
Note:

 : inside of Handset

5 Location of Controls and Components

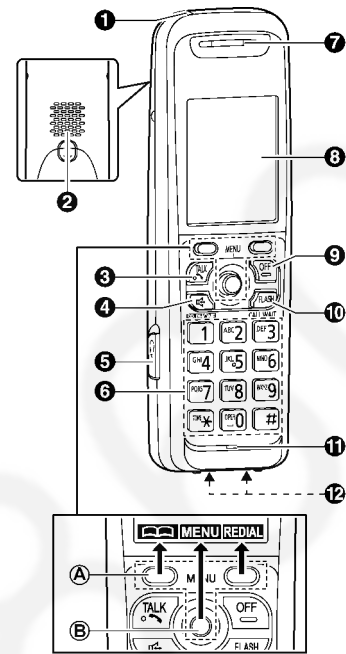
5.1. Controls

5.1.1. Base Unit



- ① Charge contacts
② [LOCATOR] (Locator)

5.1.2. Handset



- ① Charge indicator
Ringer indicator
Message indicator
② Speaker
③ [TALK] (TALK)
④ [SP-PHONE] (SP-PHONE: Speakerphone)
⑤ Headset jack
⑥ Dial keypad
[*] (TONE: Tone)
⑦ Receiver
⑧ Display
⑨ [OFF] (Off)
⑩ [FLASH]
[CALL WAIT] (Call wait)
⑪ Microphone
⑫ Charge contacts

■ Control type

Ⓐ Soft keys

The handset features 2 soft keys and a joystick. By pressing a soft key, or by pressing the center of the joystick, you can select the feature shown directly above it on the display.

Ⓑ Joystick

By pushing the joystick ([▲], [▼], [◀], or [▶]) repeatedly, you can:

- scroll through (up, down, left, or right) various lists or items
- adjust the receiver or speaker volume (up or down) while talking

- As all multiple items cannot be displayed on screen at the same time, you can quickly search the desired item to move screens by pushing the joystick right or left, instead of scrolling down or up line by line.

5.2. Display

Handset display items

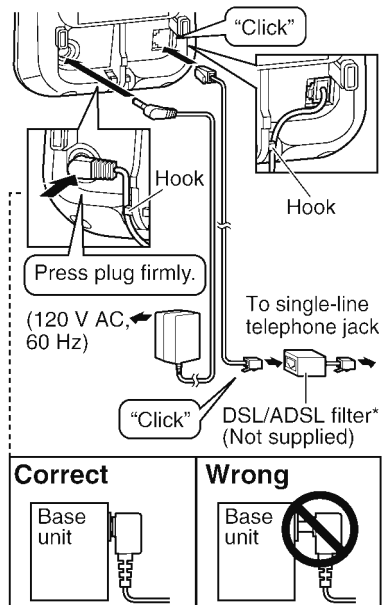
Item	Meaning
	Within range of a base unit
	Out of range of a base unit
	The line is in use. • When flashing: – The call is put on hold. • When flashing rapidly: An incoming call is now being received.
	Speaker is on.
	Ringer volume is off.
	Night mode is on.
	Clarity booster is on.
	Alarm is on.
	Handset number
	Battery level
	Blocked call

6 Installation Instructions

6.1. Connections

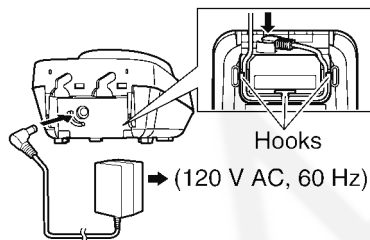
- Use only the supplied Panasonic AC adaptor PQLV219Z.

Base unit



*For DSL/ADSL service users

Charger



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.

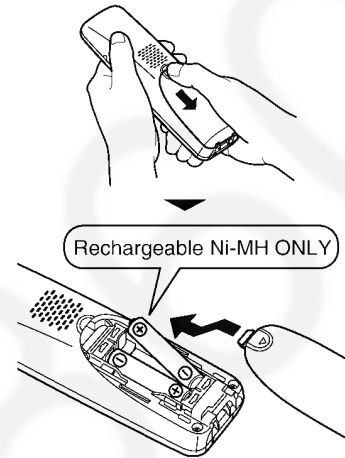
During a power failure

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. Emergency power can be supplied to the unit by connecting a Panasonic battery back-up power supply KX-TCA230.

6.2. Battery

6.2.1. Battery Installation

- USE ONLY Ni-MH batteries AAA (R03) size.
- Do NOT use Alkaline/Manganese/Ni-Cd batteries.
- Confirm correct polarities ($\oplus$, $\ominus$).



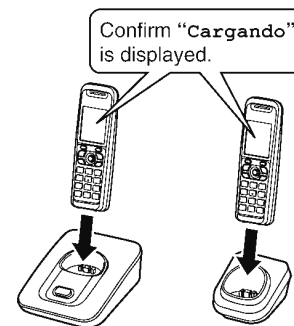
Note:

- Use the supplied rechargeable batteries. For replacement, we recommend using the Panasonic rechargeable batteries HHR-4EPT or HHR-4MPT.
- Wipe the battery ends ($\oplus$, $\ominus$) with a dry cloth.
- Avoid touching the battery ends ($\oplus$, $\ominus$) or the unit contacts.

6.2.2. Battery Charge

Charge for about 7 hours.

- When the batteries are fully charged, the charge indicator goes off.



Note:

- It is normal for the handset to feel warm during charging.
- Clean the charge contacts of the handset, base unit, and charger with a soft and 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

Icon	Battery level
	High
	Medium
	Low
	Needs charging.
	Empty

Note:

- The batteries need to be charged if:
 - the handset beeps while you are engaged in a call.

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

Operation	Operating time
In continuous use	5 hours max.* ¹
Not in use (standby)	11 days max.

*1 When the clarity booster feature is turned on:
3 hours max.

Note:

- 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 customize the unit by programming the following features using the handset.
To access the features, there are 2 methods:

- scrolling through the display menus
- using the direct commands
- Direct command is the main method used in this service manual.
- The displays may be slightly different depending on whether you select "Un elemento" or "Multi elemento" as the display mode. The displays shown in this service manual are "Un elemento".

7.1.1. Programming by Scrolling through the Display Menus

- 1 **[MENU]** (center of joystick)
- 2 Select the desired top-menu by pushing the joystick in any direction. → **[SELEC.]**
- 3 Push the joystick down or up to select the desired item in sub-menu 1. → **[SELEC.]**
 - In some cases, you may need to select from sub-menu 2. → **[SELEC.]**
- 4 Push the joystick down or up to select the desired setting. → **[GUARDA]**
 - This step may vary depending on the feature being programmed.
 - To exit the operation, press **[OFF]**.

Main menu	Sub-menu 1	Sub-menu 2
Lista de Llamada →}	–	–
Ajustar Fecha / Hr ⌚	Fecha y hora ^{**1}	–
	Alarma	–
	Ajustar hora ^{**1}	–
Acceso a M.V. ☎	–	–
Intercom •)))	–	–
Ajuste inicial ⚙	Ajustar Timbre	Vol. de timbre
		Tipo de timbre
		Modo nocturno
		– Enc. / Apag.
		– Inicio / Fin
	Ajustar Fecha / Hr	Fecha y hora ^{**1}
		Alarma
		Ajustar hora ^{**1}

Main menu	Sub-menu 1	Sub-menu 2
Ajuste inicial 	Mensaje de Voz	Guardar # de MV ^{*1}
		Detectar Tono MV ^{*1}
	Bloqueo llamadas ^{*1}	—
	Alerta Mensaje	—
	Configura Pantalla	Modo de Pantalla
		Contraste LCD
	Tono Tecla	—
	Cont. Automátic.	—
	Ingrese Cód.Área ^{*1}	—
	Ajustes de Línea	Ajustar Marcación ^{*1}
		Ajustar Tiem Flash ^{*1}
		Ajustar Modo línea ^{*1}
	Registrar	Registrar Auricular
Ajustar Timbre 		Desregistrar
	Cambiar Idioma	Pantallas
	Vol. de timbre	—
	Tipo de timbre	—
	Modo nocturno	Enc. / Apag.
		Inicio / Fin

^{*1} If you program these settings using one of the handsets, you do not need to program the same item using another handset.

7.1.2. Programming using the Direct Commands

- 1 **[MENU]** (center of joystick) → **[⇐]**
- 2 Enter the desired feature code.
- 3 Enter the desired setting code. → **[GUARDA]**
 - This step may vary depending on the feature being programmed.
 - To exit the operation, press **[OFF]**.

Note:

- In the following table, <> indicates the default settings.

Feature	Feature code	Setting code	System setting ^{*1}
Alarma	[7][2][0]	[1]: Una vez [2]: Diariamente [0]: <Apagado>	—
Cont. Automático. ^{*2}	[2][0][0]	[1]: Encendida [0]: <Apagada>	—
Blq S/ Notif (Block calls without phone number)	[2][4][0]	[1]: Encendido [0]: <Apagado>	●
Bloqueo llamadas	[2][1][7]	—	●
Lista de Llamada	[2][1][3]	—	—
Fecha y hora	[1][0][1]	—	●
Desregistrar	[1][3][1]	—	—
Modo de Pantalla	[1][9][2]	[1]: Multi elemento [0]: <Un elemento>	—
Intercom	[2][7][4]	—	—
Tono Tecla ^{*3}	[1][6][5]	[1]: <Encendido> [0]: Apagado	—
Contraste LCD (Display contrast)	[1][4][5]	[1]–[6]: Level 1–6 <3>	—
Alerta Mensaje	[3][4][0]	[1]: <Encendida> [0]: Apagada	—
Modo nocturno (On/Off)	[2][3][8]	[1]: Encendido [0]: <Apagado>	—
Modo nocturno (Start/End)	[2][3][7]	<23:00/06:00>	—
Registrar Auricular	[1][3][0]	—	—
Tipo de timbre ^{*4} (Handset)	[1][6][1]	[1]–[3]: Tono <1>–3 [4]–[7]: Melodía 1–4	—
Ingrese Cód.Área	[2][5][5]	—	●
Vol. de timbre ^{*5} (Handset)	[1][6][0]	[1]: Low [2]: Medium [3]: <High> [0]: Off	—
Ajustar Marcación	[1][2][0]	[1]: Pulsos [2]: <Tonos>	●
Ajustar Tiem Flash ^{*6}	[1][2][1]	[0]: 900ms [1]: 700ms [2]: 600ms [3]: 400ms [4]: 300ms [5]: 250ms [*]: 200ms [⇐]: 160ms [6]: 110ms [7]: <100ms> [8]: 90ms [9]: 80ms	●
Ajustar Modo línea ^{*7}	[1][2][2]	[1]: A [2]: 	●
Guardar # de MV	[3][3][1]	—	●
Ajustar hora ^{*8} (Caller ID subscribers only)	[2][2][6]	[1]: ID llam aut [0]: <Manual>	●
Acceso a M.V.	[3][3][0]	—	—
Detectar Tono MV	[3][3][2]	[1]: Encendido [0]: <Apagado>	●

- *1 If "System setting" column is checked, you do not need to program the same item using another handset.
- *2 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.
- *3 Turn this feature off if you prefer not to hear key tones while you are dialing or pressing any keys, including confirmation tones and error tones.
- *4 If 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 When the ringer volume is turned off, $\propto$ is displayed and the handset does not ring for outside calls.
However even when the ringer volume is set to off, the handset rings at the low level for alarm, and intercom calls, and paging.
- *6 The flash time depends on your telephone exchange or host PBX. Contact your PBX supplier if necessary.
- *7 Generally, the line mode setting should not be adjusted. If **ENUSO** is not displayed when another phone connected to the same line is in use, you need to change the line mode to "A".
- *8 If the Caller ID time and date display service is available in your area, this feature allows the unit to automatically adjust the date and time setting when caller information is received. To use this feature, set the date and time first.

7.2. Error Messages

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

Display message	Cause/solution
Ocupado or Sist. Ocupado Intente Más Tarde	• The called unit is in use. • Other units are in use and the system is busy. Try again later. • The handset you are using is too far from the base unit. Move closer and try again. • The handset's registration may have been canceled. Re-register the handset.
Verif. Línea	• The supplied telephone line cord has not been connected yet or not connected properly. Check the connections.
Error!	• The handset's registration has failed. Move the handset and base unit away from all electrical appliances and try again.
No válido	• There is no handset registered to the base unit matching the handset number you entered. • The handset is not registered to the base unit. Register the handset.
No enlace a base Rec Adap base princ	• The handset has lost communication with the base unit. Move closer to the base unit and try again. • Unplug the base unit's AC adaptor to reset the unit. Reconnect the adaptor and try again. • The handset's registration may have been canceled. Re-register the handset.
Requiere suscrip a ID de Llam	• 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.
Guardar # de MV	• You have not stored the voice mail access number. Store the number.
Use batería Recargable	• A wrong type of battery such as Alkaline or Manganese was inserted. Use only the rechargeable Ni-MH batteries.

7.3. Troubleshooting

If you still have difficulties after following the instructions in this section, disconnect the base unit's AC adaptor, then reconnect the base unit's AC adaptor. Remove the batteries from the handset, and then insert the batteries into the handset again.

General use

Problem	Cause/solution
The unit does not work.	• Make sure the batteries are installed correctly. • Fully charge the batteries. • Check the connections. • Unplug the base unit's AC adaptor to reset the unit. Reconnect the adaptor and try again. • The handset has not been registered to the base unit. Register the handset.
I cannot hear a dial tone.	• The base unit's AC adaptor or telephone line cord is not connected. Check the connections. • 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. • 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.
The indicator on the handset flashes slowly.	• New voice mail messages have been recorded. Listen to the new voice mail messages.

Programmable settings

Problem	Cause/solution
While programming, the handset starts to ring.	• A call is being received. Answer the call and start again after hanging up.
I cannot register a handset to a base unit.	• The maximum number of handsets (6) is already registered to the base unit. Cancel unused handset registrations from the base unit. • Place the handset and the base unit away from other electrical appliances.

Battery recharge

Problem	Cause/solution
The handset beeps and/or  flashes.	• Battery charge is low. Fully charge the batteries.
I fully charged the batteries, but  still flashes or  is displayed.	• Clean the charge contacts and charge again. • It is time to replace the batteries.
I fully charged the batteries, but the operating time seems to be shorter.	• Clean the battery ends ($\oplus$, $\ominus$) and the charge contacts with a dry cloth and charge again.

Making/answering calls, intercom

Problem	Cause/solution
 is displayed.	• The handset is too far from the base unit. Move closer. • The base unit's AC adaptor is not properly connected. Reconnect AC adaptor to the base unit. • 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. • The handset is not registered to the base unit. Register it.
Noise is heard, sound cuts in and out.	• 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. • Move closer to the base unit. • 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.
The handset does not ring.	• The ringer volume is turned off. Adjust the ringer volume. • Night mode is turned on. Turn it off.
I cannot make a call.	• The dialing mode may be set incorrectly. Change the setting. • The handset is too far from the base unit. Move closer and try again.

Caller ID

Problem	Cause/solution
Caller information is not displayed.	• You must subscribe to Caller ID service. Contact your service provider/telephone company for details. • If your unit is connected to any additional telephone equipment such as a Caller ID box or cordless telephone line jack, 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 displayed late.	• Depending on your service provider/telephone company, the unit may display the caller's information at the 2nd ring or later. • Move closer to the base unit.
Time on the unit has shifted.	• Incorrect time information from incoming Caller ID changes the time. Set the time adjustment to "Manual" (off).

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 an authorized service center.

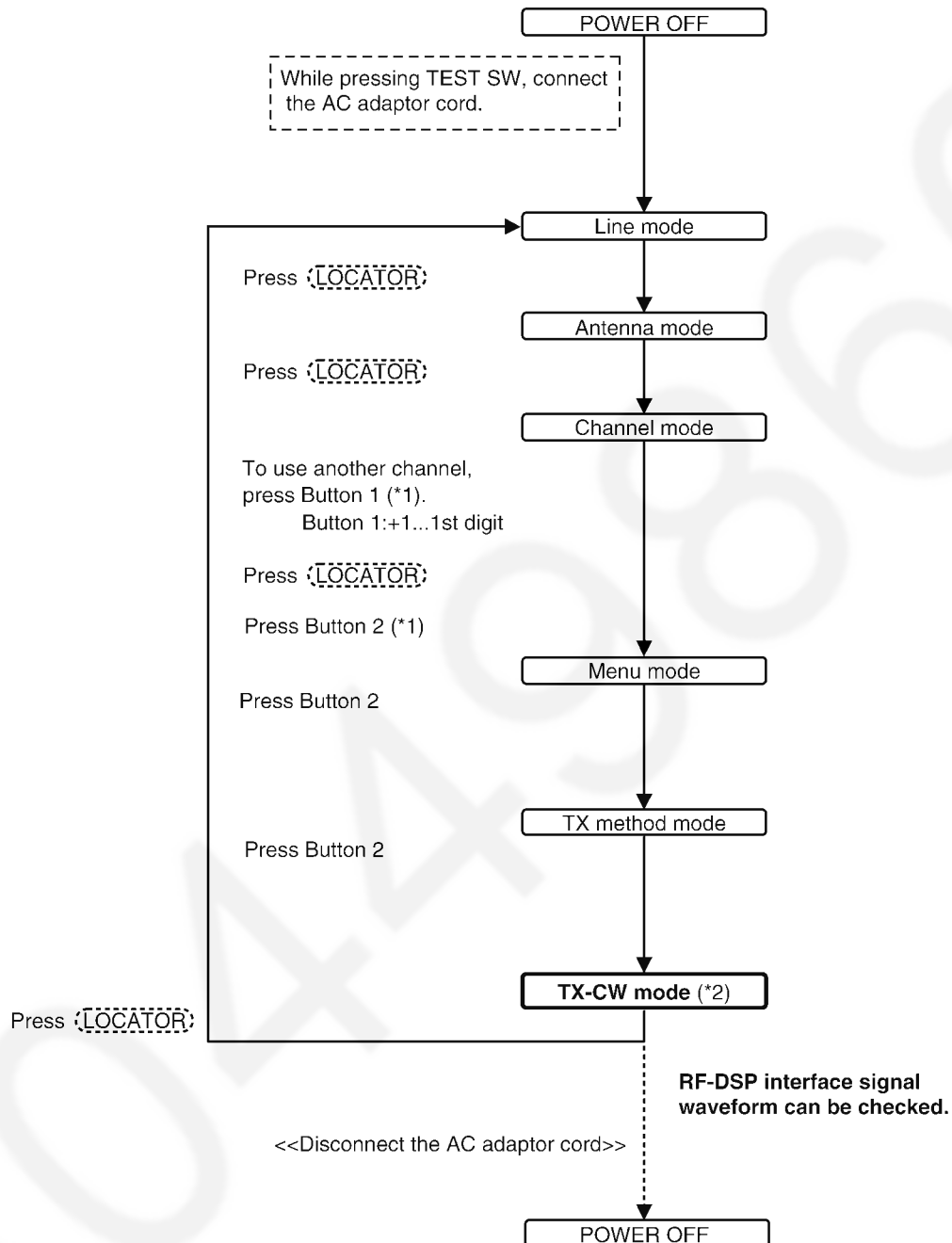
Caution:

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

8 Test Mode

8.1. Adjustment and Test Mode Flow Chart

8.1.1. TX-CW Mode for Base Unit

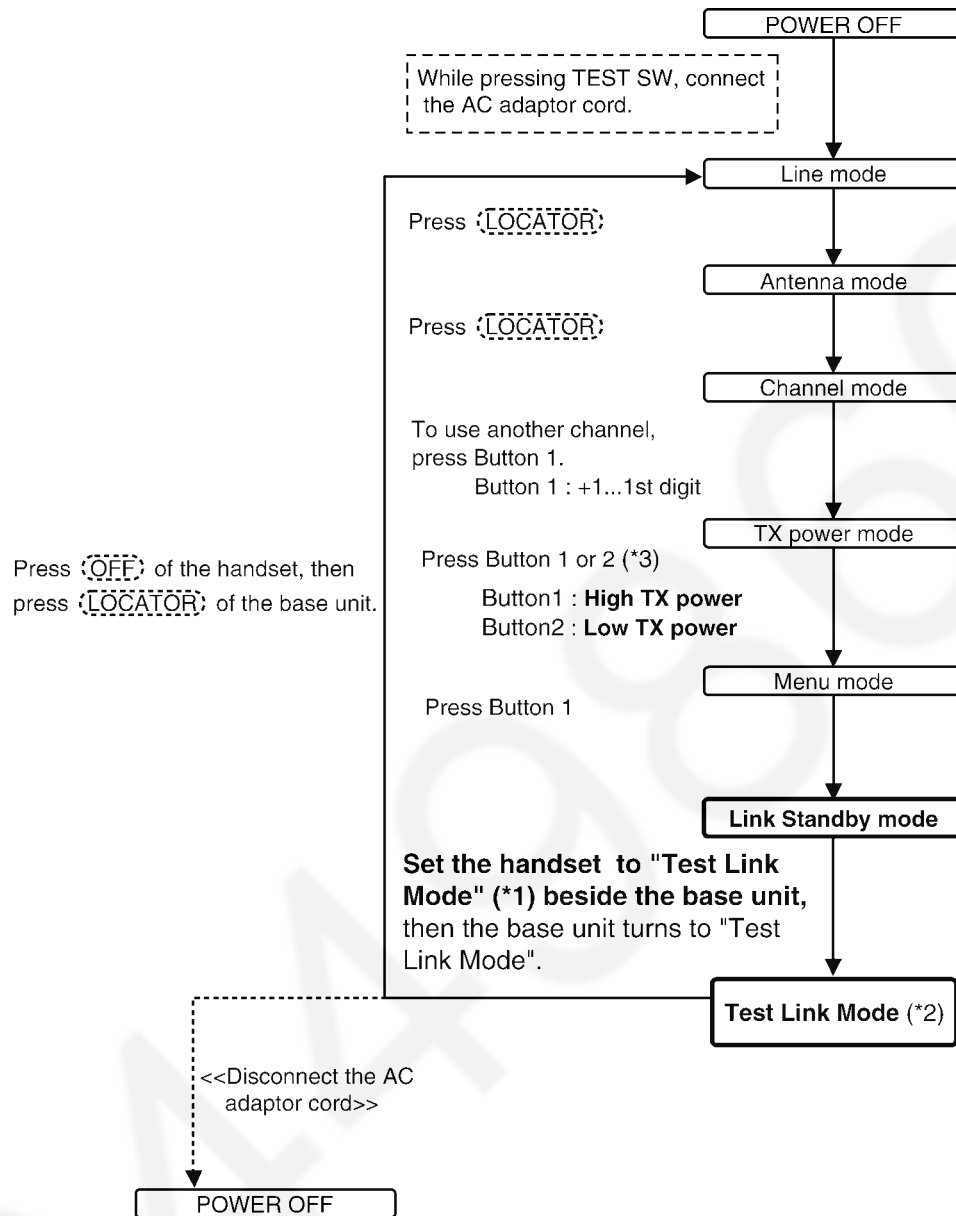


Note:

(*1) When you check test mode, connect to the external Buttons because Base Unit has only LOCATOR key. Refer to **Bottom View** (P.86).

(*2) Refer to **Check Table for RF part** (P.52).

8.1.2. Test Link Mode for Base Unit



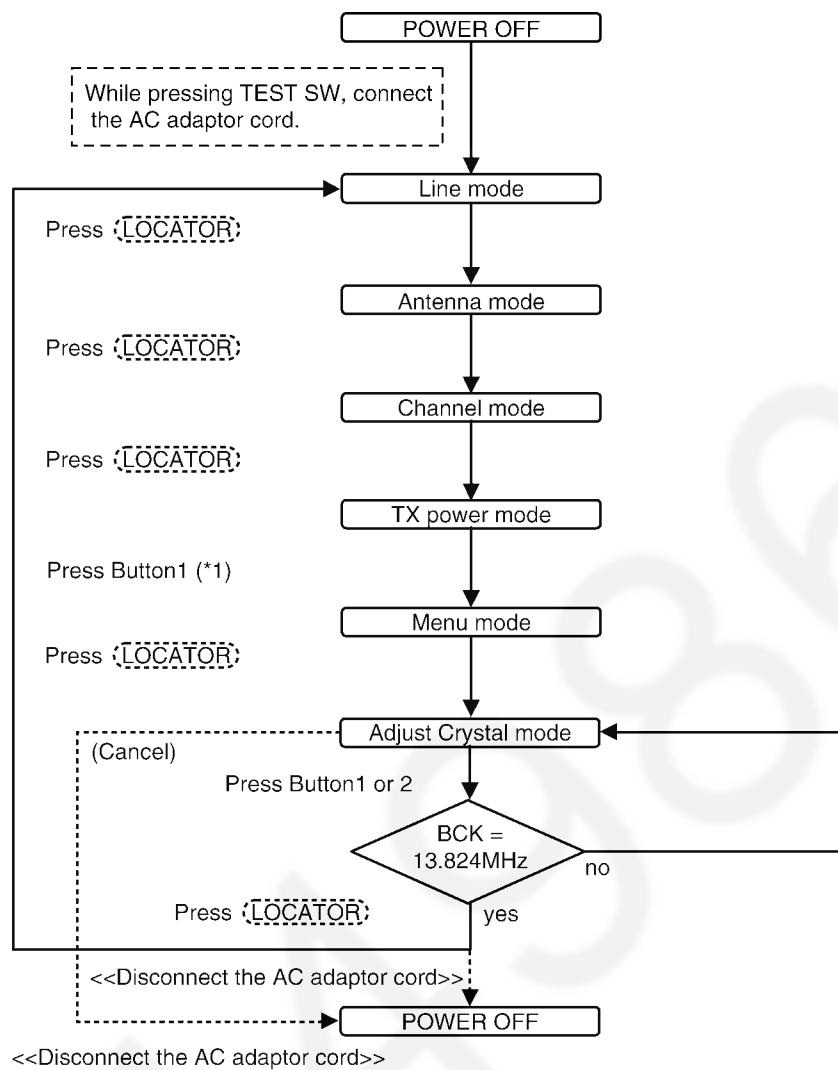
Note:

(*1) Refer to **Test Link Mode for Handset** (P.43). If you can not proceed to the next step, refer to **Registering a Handset to a Base Unit** (P.50).

(*2) Refer to **Check Table for RF part** (P.52).

(*3) When you check test mode, connect to the external Buttons because Base Unit has only LOCATOR key. Refer to **Bottom View** (P.86).

8.1.3. Adjustment Mode for Base Unit



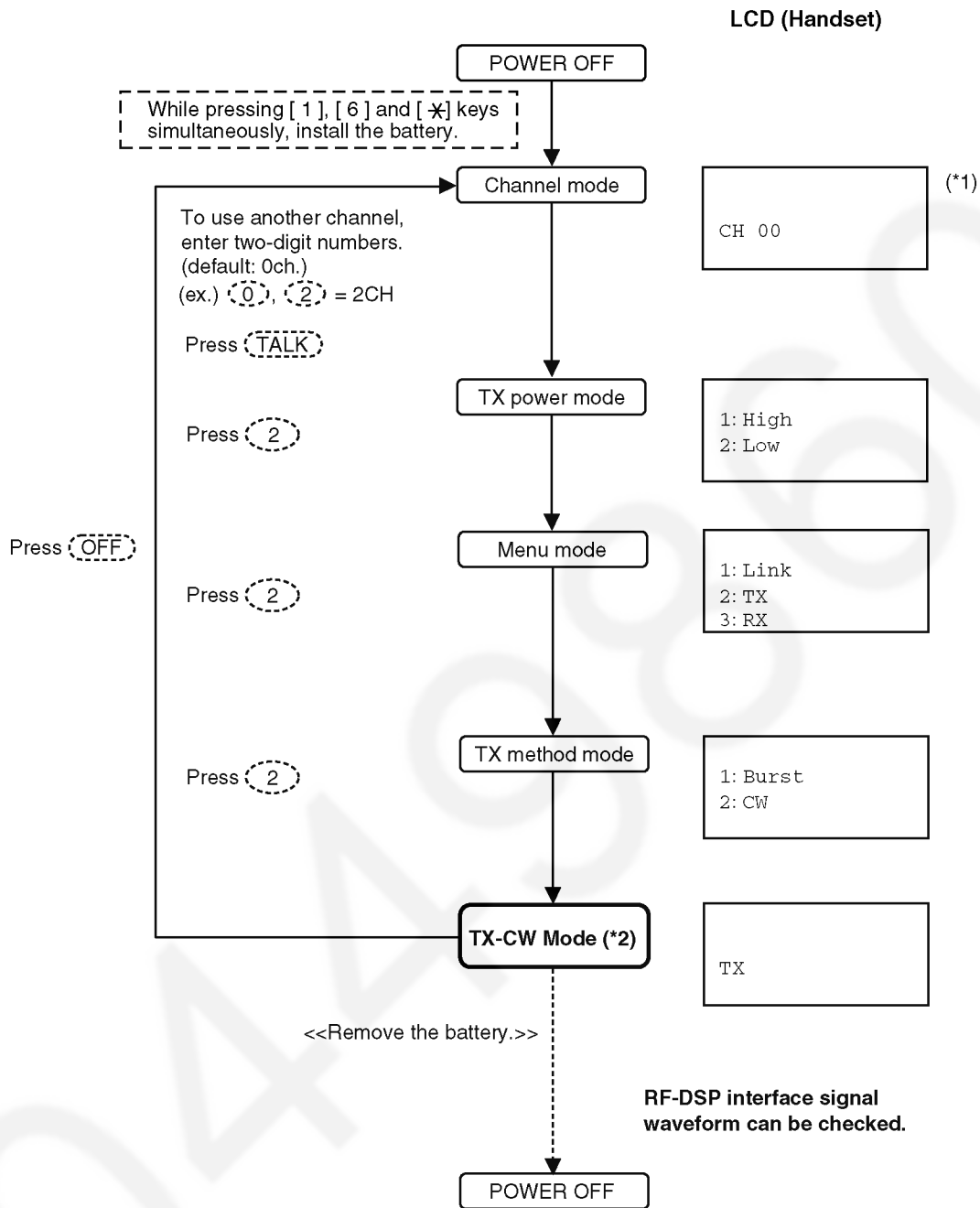
Cross Reference

Check and Adjust Frequency (Base Unit) (P.62)

Note:

(*1) When you check test mode, connect to the external Buttons because Base Unit has only LOCATOR key. Refer to **Bottom View** (P.86).

8.1.4. TX-CW Mode for Handset



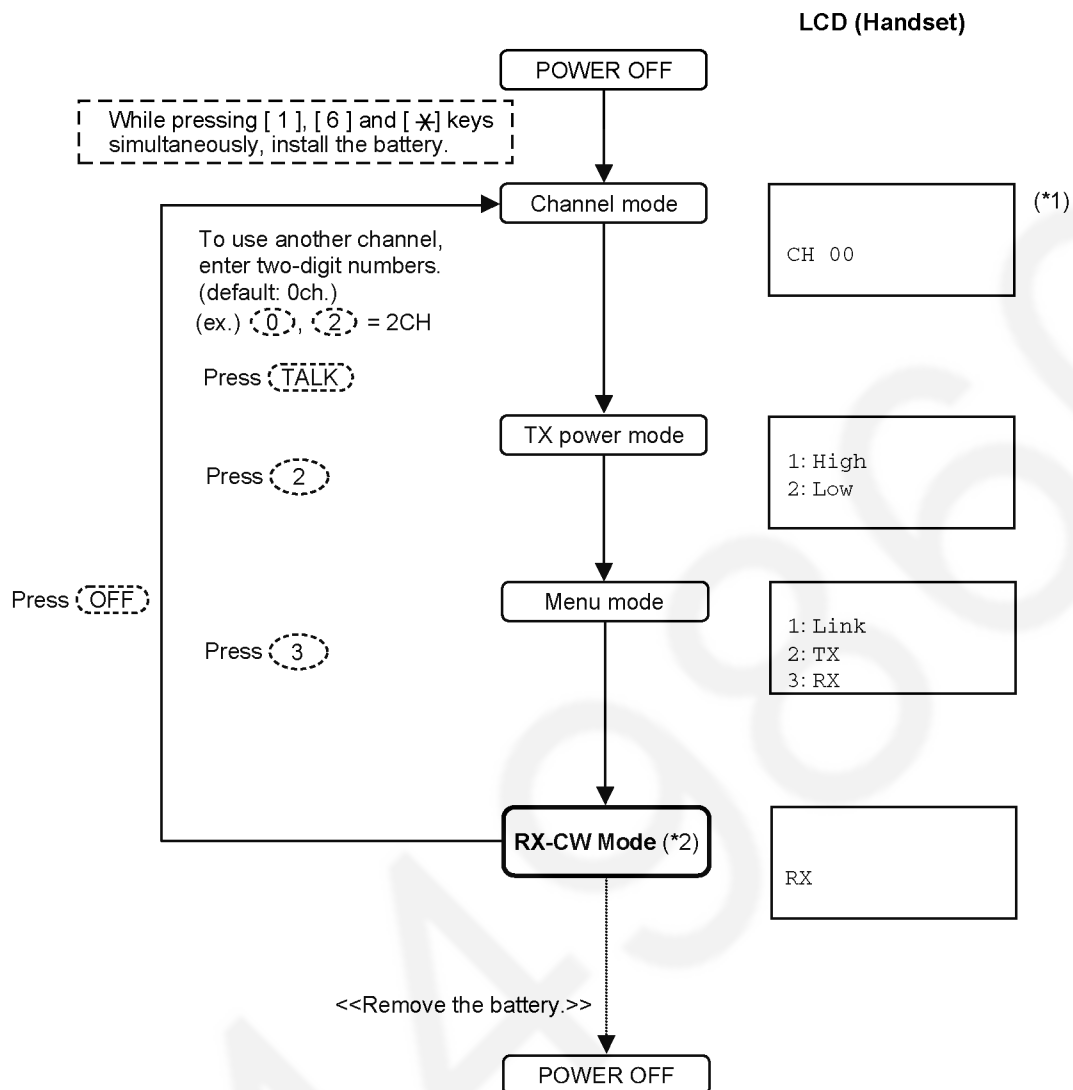
Note:

(*1) LCD displays the Channel number.

(exception: default/ CH00 = 0ch.)

(*2) Refer to **Check Table for RF part** (P.52).

8.1.5. RX-CW Test Mode for Handset

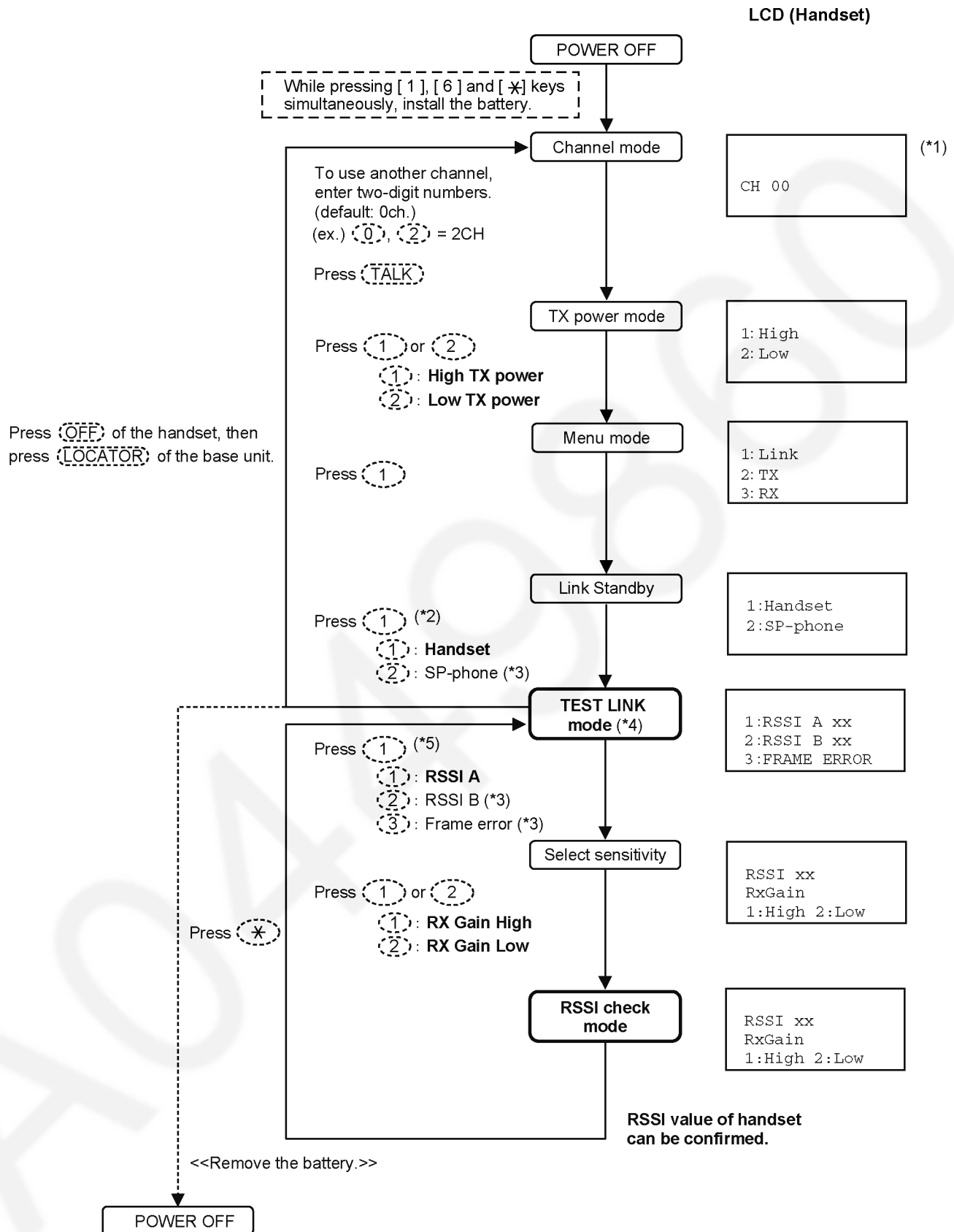


Note:

(*1) LCD displays the Channel number.
(exception: default/ CH00 = 0ch.)

(*2) Refer to **Check Table for RF part** (P.52).

8.1.6. Test Link Mode for Handset



Note:

(*1) LCD displays the Channel number.
(exception: default/ CH00 = 0ch.)

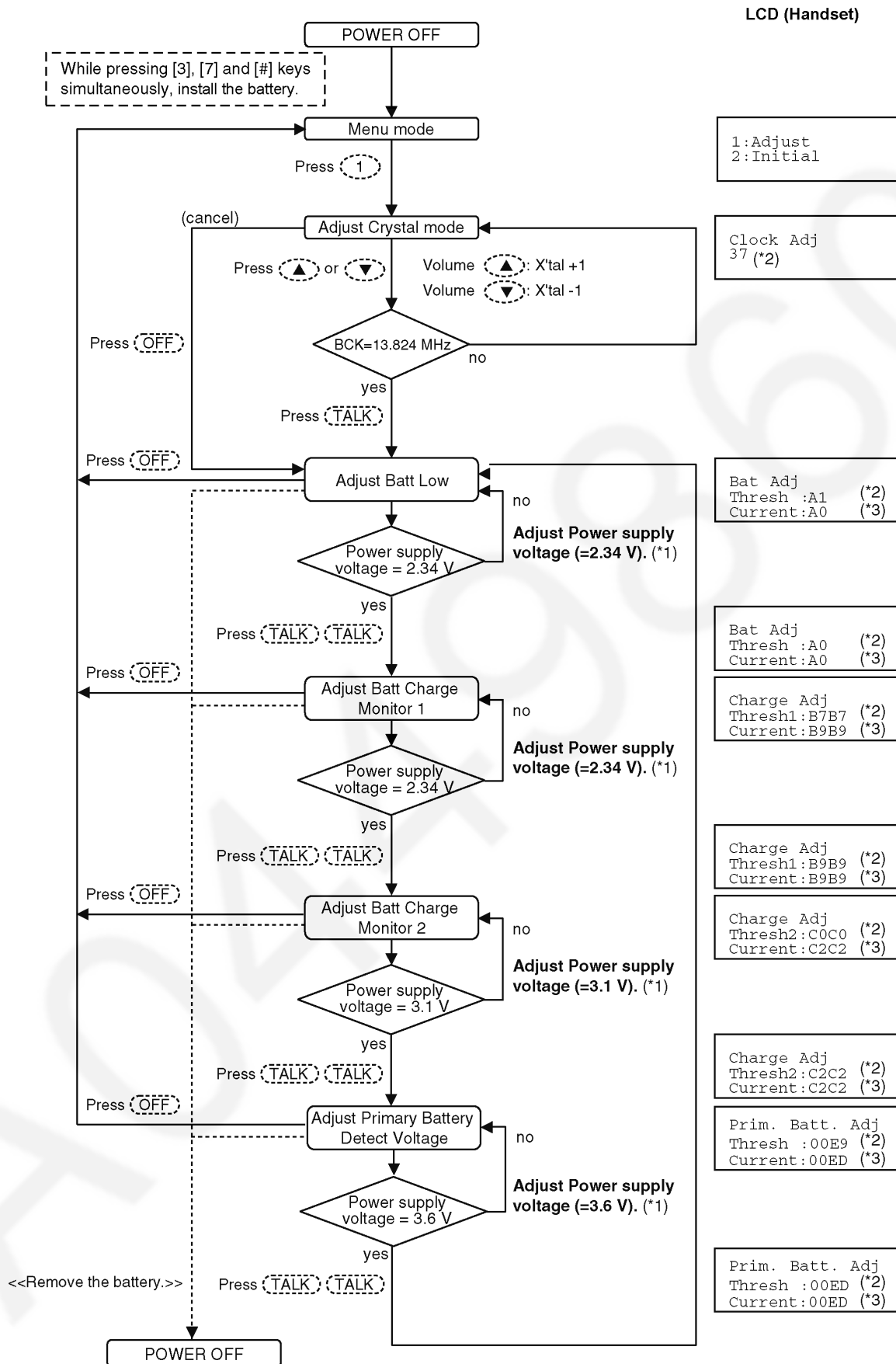
(*2) If can not proceed to the next step, refer to **Registering a Handset to a Base Unit** (P.50).

(*3) for factory use only.

(*4) Refer to **Check Table for RF part** (P.52).

(*5) Operation for regular base unit. Refer to **CHART1** in the **TEST RANGE Check** (P.53).

8.1.7. Adjustment Mode for Handset



Cross Reference

(*1) Adjust Battery Low Detector Voltage (Handset) (P.62)

Note:

(*2) These are the default values.

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

9 Service Mode

9.1. How to Clear User Setting

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

This operation should not be performed for a usual repair.

9.1.1. Base Unit

1. Register the dummy handset to the base unit you want to initialize. (*1)(*2)
2. Press the **[OFF]** key to make the handset idle.
3. Press **[1]**, **[5]**, **[9]** and **[*]** keys on the handset at the same time.
4. After a short time a beep sound is heard from the handset and its LCD display disappears.
 - At this point initialization is complete.
 - Be careful that both base unit and handset are initialized.
 - At this time the handset is switched to STOP mode so it is necessary to remove and re-insert the handset battery to restart the handset.
5. Remove and re-insert the handset battery to re-start the handset.
6. Select **[Deregistration]** on the handset menu to release the handset's registration. (*3)

Attention:

Dummy handset is necessary if you want to initialize the base unit only.

The base unit and handset can be initialized at the same time using the original handset though the procedure listed above except step 1 and 6.

Note:

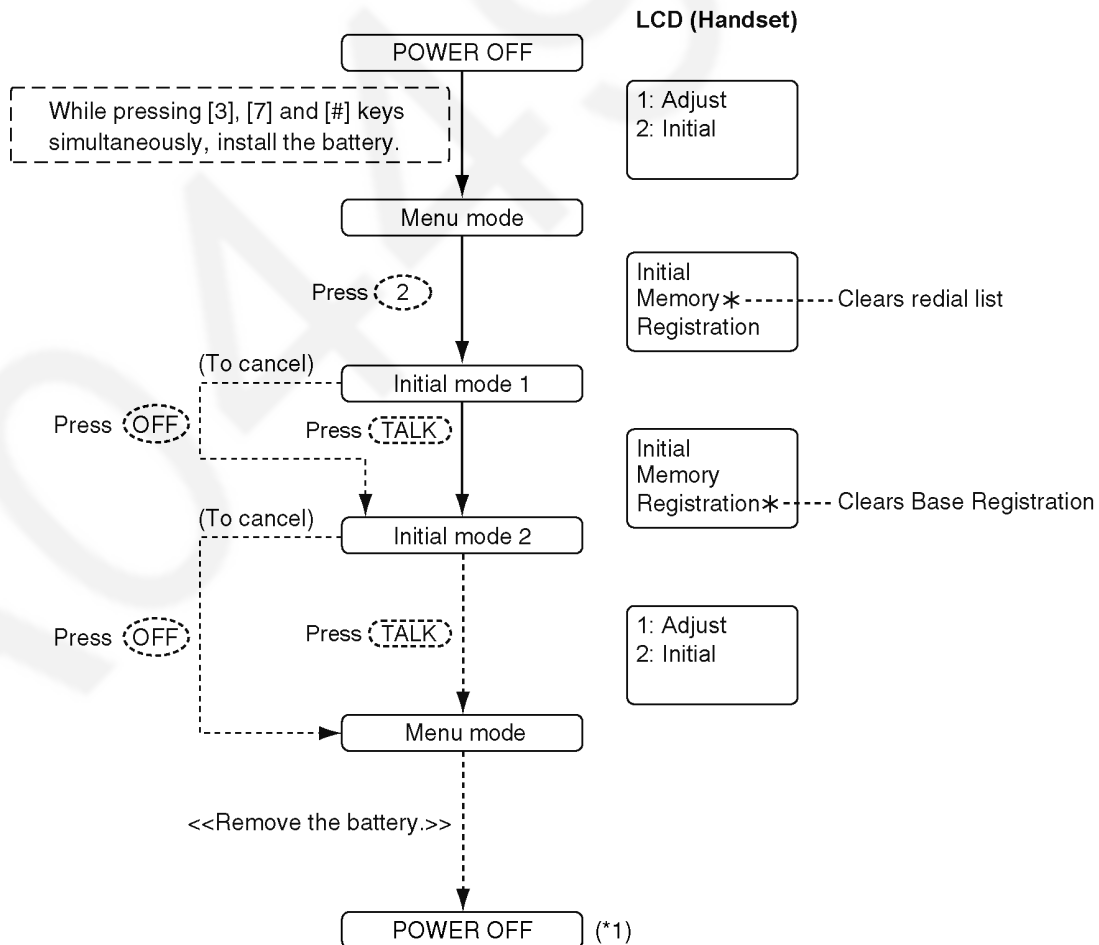
(*1) Refer to **Registering a Handset to a Base Unit** (P.50).

(*2) If registration is failed, deregister all handsets from the base unit and register again.

Refer to **Deregistering All Handsets by the Base Unit** (P.50).

(*3)Refer to **Deregistering a Handset** (P.50).

9.1.2. Handset



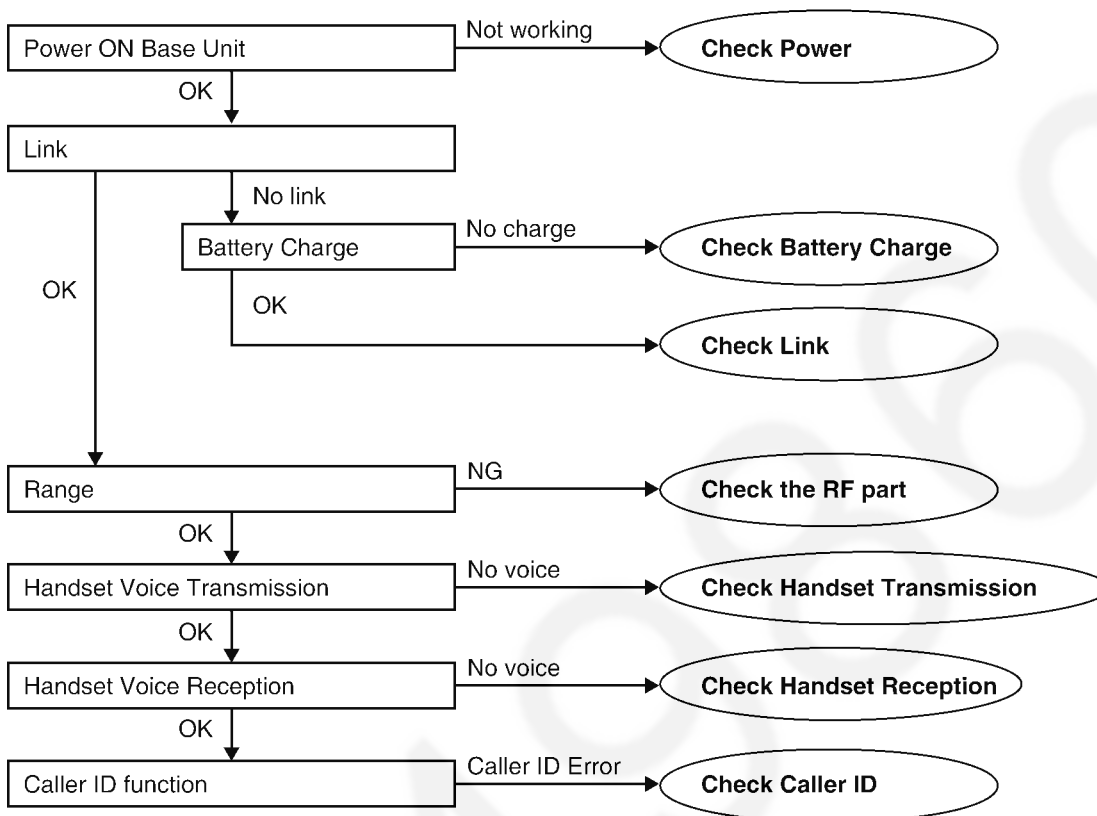
Note:

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

10 Troubleshooting Guide

10.1. Troubleshooting Flowchart

FLOW CHART



Cross Reference:

Check Power (P.47)

Check Battery Charge (P.47)

Check Link (P.48)

Check the RF part (P.49)

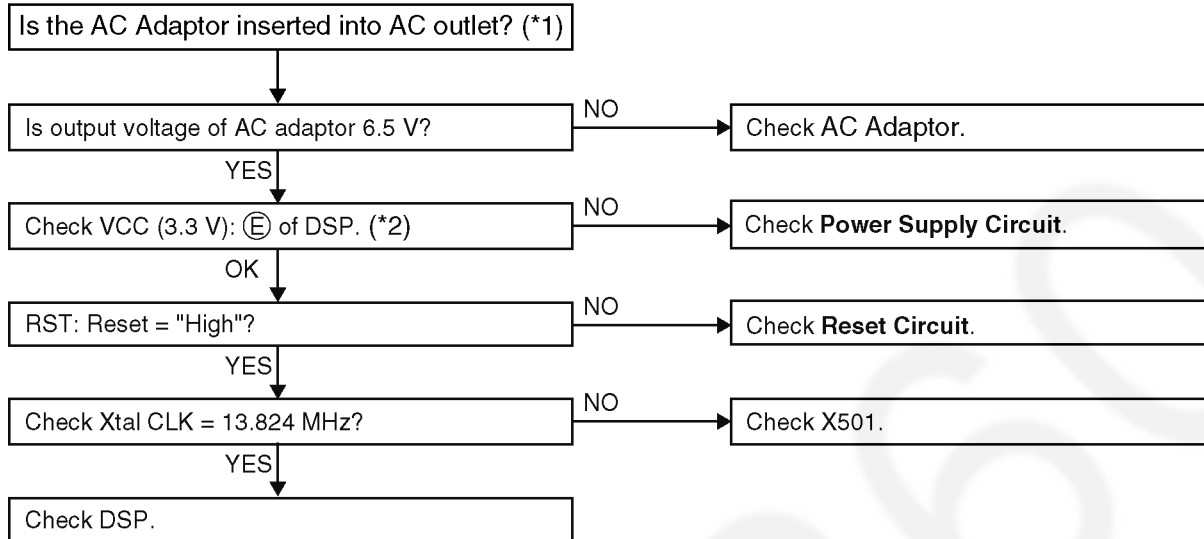
Check Handset Transmission (P.56)

Check Handset Reception (P.56)

Check Caller ID (P.56)

10.1.1. Check Power

BASE UNIT



Cross Reference:

Power Supply Circuit (P.12)

Reset Circuit (P.14)

Note:

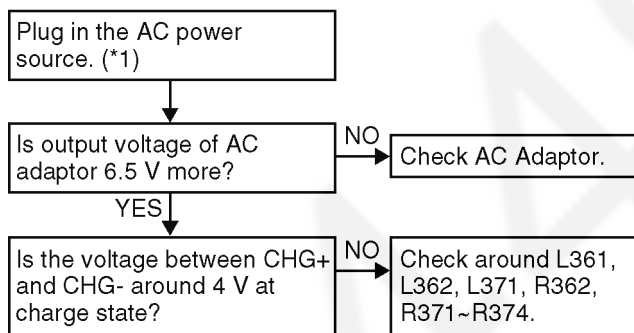
DSP is IC501.

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

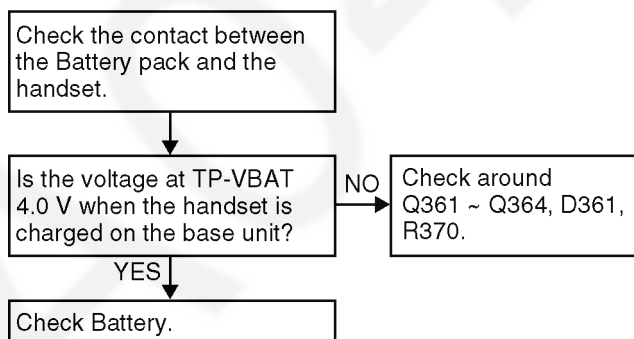
(*2) Refer to **Circuit Board (Base Unit_Main)** (P.85).

10.1.2. Check Battery Charge

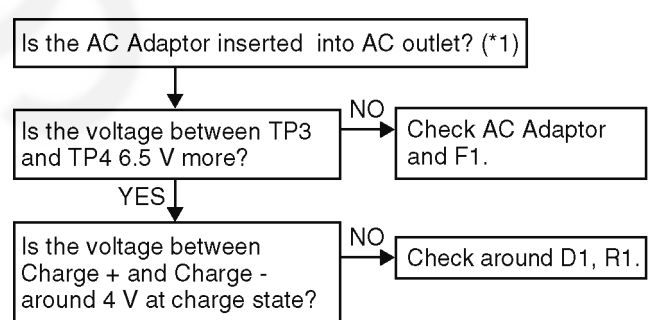
BASE UNIT



HANDSET



CHARGER UNIT

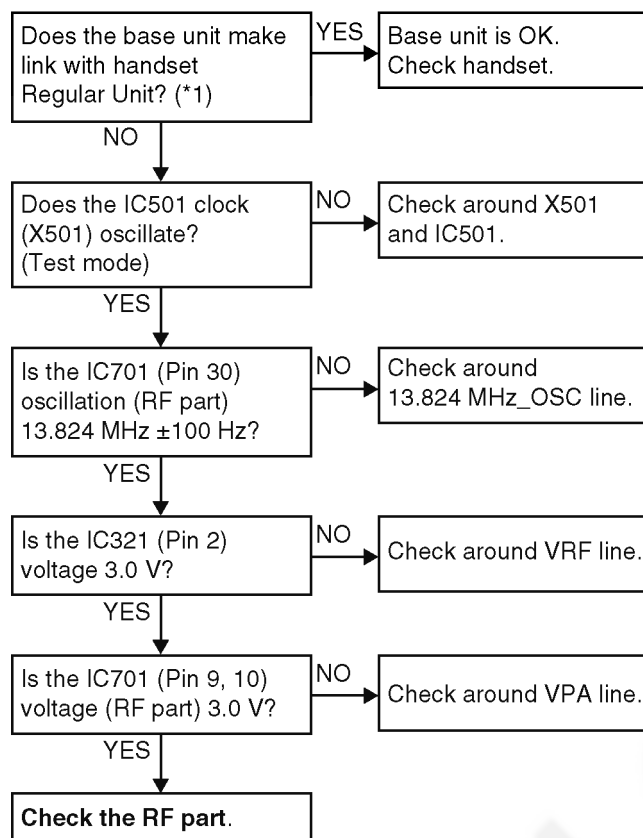


Note:

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

10.1.3. Check Link

BASE UNIT

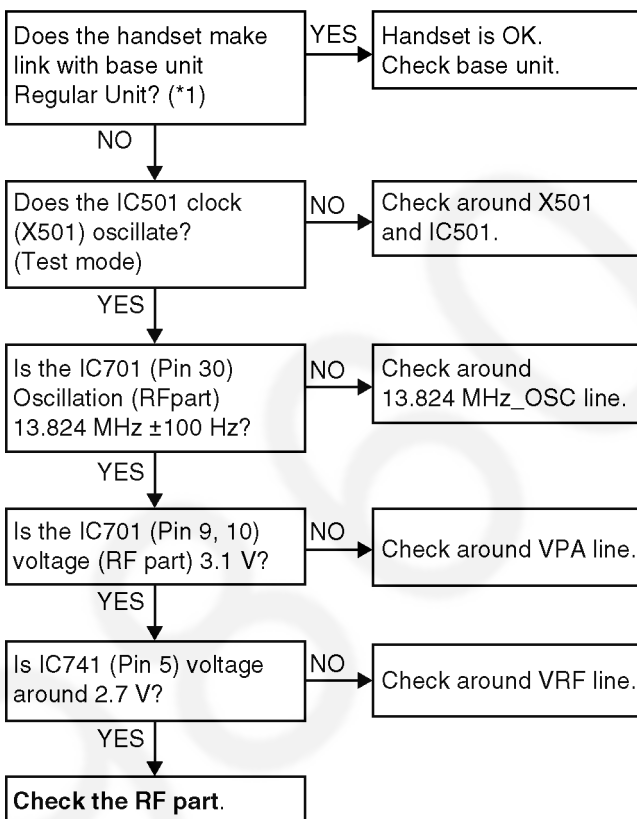


Note:

DSP is IC501.

(*1) Refer to **Finding out the Defective part** (P.49).

HANDSET



Cross Reference:

Check the RF part (P.49)

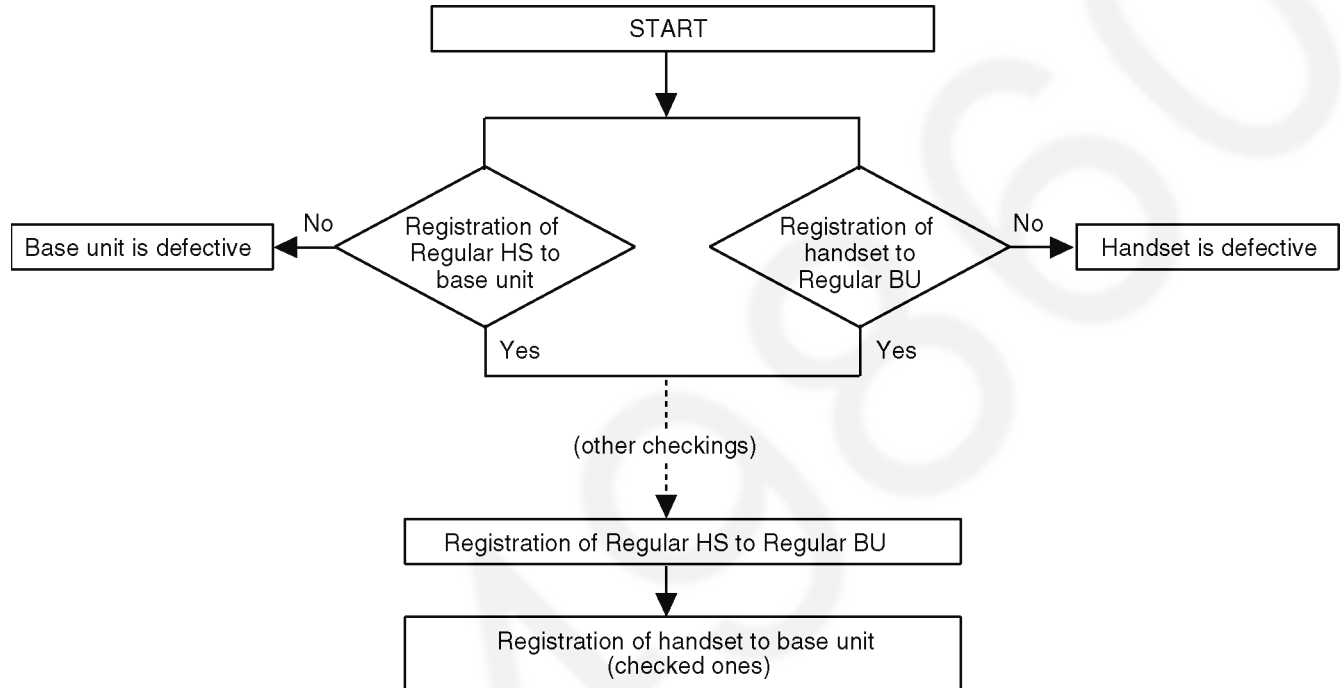
10.1.4. Check the RF part

10.1.4.1. Finding out the Defective part

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

After All the Checkings or Repairing

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



Note:

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

10.1.4.1.1. Registering a Handset to a Base Unit

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

- 1 **Handset:**
[MENU] (center of joystick) → [Ⓜ][1][3][0]
- 2 **Base unit:**
Press and hold [LOCATOR] for about 4 seconds . (No registration tone)
 - 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.
- 3 **Handset:**
Press [OK], then wait until a long beep sounds.
- 4 [OFF]

Note:

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

10.1.4.1.2. Deregistering a Handset

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

- 1 [MENU] (center of joystick) → [Ⓜ][1][3][1]
- 2 [3][3][5] → [OK]
- 3 Select the handset you want to cancel by pressing the desired handset number.
- 4 [▼]/[▲]: “s1” → [SELEC.]

10.1.4.1.3. Deregistering All Handsets by the Base Unit

Base unit:

- 1 Connect the AC adaptor cord while pressing [LOCATOR].
- 2 Press and hold [LOCATOR] again until a long beep sounds.

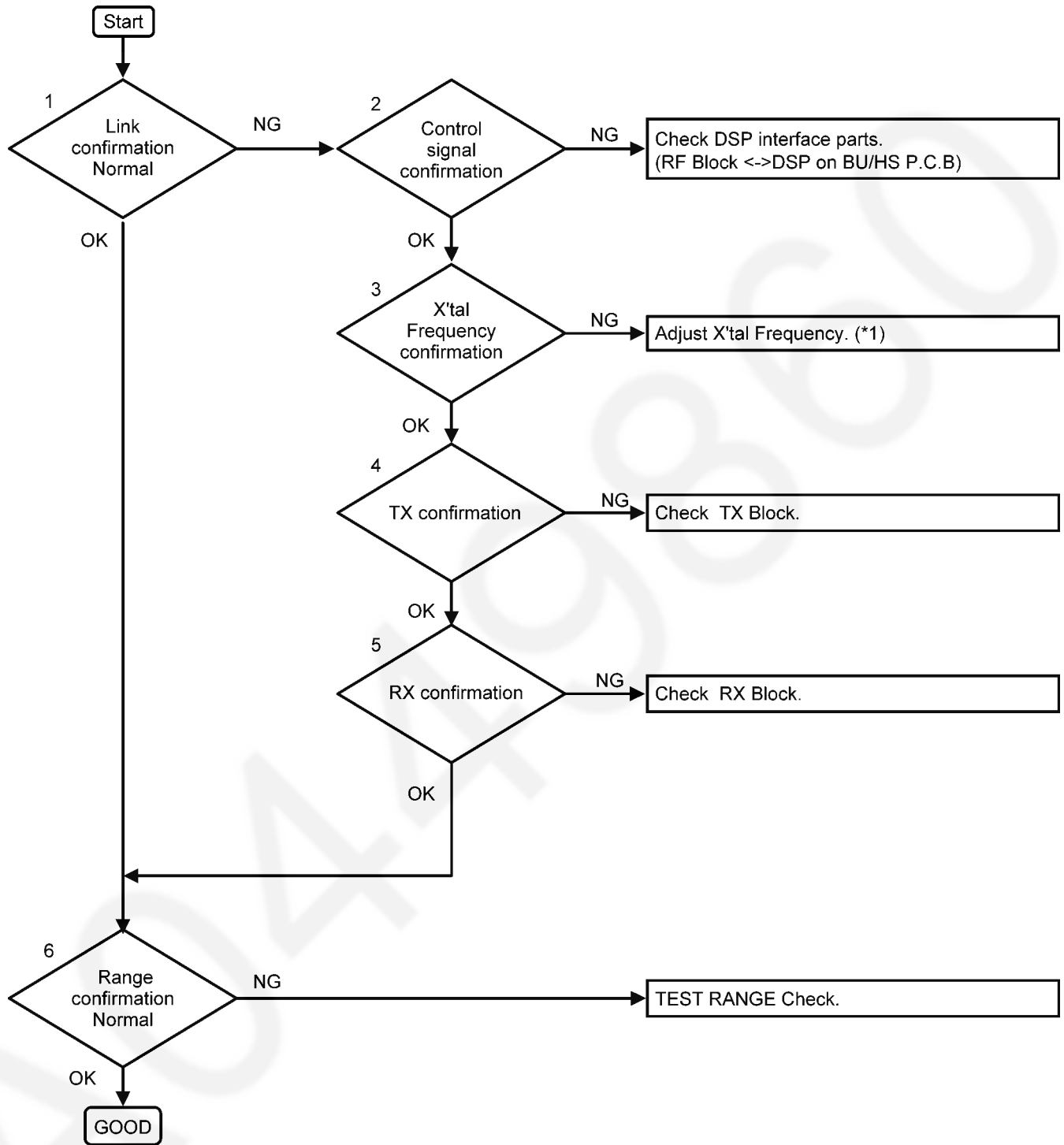
Important:

When deregistering all handsets by the base unit, the registration information of all handsets in the base unit is erased.

However the registration information in each handset will still remain.

10.1.4.2. RF Check Flowchart

Each item (1 ~ 6) of RF Check Flowchart corresponds to **Check Table for RF part** (P.52).
Please refer to the each item.



Note:

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

10.1.4.3. Check Table for RF part

No.	Item	BU (Base Unit) Check	HS (Handset) Check
1	Link Confirmation Normal HS, BU Mode [Normal Mode]	1. Register Regular HS to BU (to be checked). 2. Press [Talk] key of the Regular HS to establish link.	1. Register HS (to be checked) to Regular BU. 2. Press [Talk] key of the HS to establish link.
2	Control signal confirmation HS, BU Mode: [Normal Mode] (*1)	Check DSP interface. (*2)	Check DSP interface. (*3) Check signal at power-on.
3	X'tal Frequency confirmation (*7) HS, BU Mode: [Adjustment] (*4)	Check X'tal Frequency. (13.824000 MHz $\pm$ 100 Hz)	Check X'tal Frequency. (13.824000 MHz $\pm$ 100 Hz)
4	TX confirmation Regular HS (BU) Mode: [Test RX Mode] BU (HS) Mode: [Test TX_Burst Mode]	1. Place Regular HS 15 cm away from a checked BU. 2. Confirm "TXDATA" waveform of BU (*6) and "RXDATA" waveform of Regular HS by Digital Oscilloscope.	1. Place Regular BU 15 cm away from a checked HS. 2. Confirm "TXDATA" waveform of HS (*5) and "RXDATA" waveform of Regular BU by Digital Oscilloscope.
5	RX confirmation Regular HS (BU) Mode: [Test TX_Burst Mode] BU (HS) Mode: [Test RX Mode]	1. Place Regular HS 15 cm away from a checked BU. 2. Confirm "RXDATA" waveform of BU (*6) and "TXDATA" waveform of Regular HS by Digital Oscilloscope.	1. Place Regular BU 15 cm away from a checked HS. 2. Confirm "RXDATA" waveform of HS (*5) and "TXDATA" waveform of Regular BU by Digital Oscilloscope.
6	Range Confirmation Normal HS, BU Mode: [Normal Mode]	1. Register Regular HS to BU (to be checked). 2. Press [Talk] key of the Regular HS to establish link. 3. Compare the range of the BU (being checked) with that of the Regular BU.	1. Register HS (to be checked) to Regular BU. 2. Press [Talk] key of the HS to establish link. 3. Compare the range of the HS (being checked) with that of the Regular HS.

Note:

 (*1)(*4) **Adjustment and Test Mode Flow Chart** (P.38)

 (*2)(*3) **RF-DSP Interface Signal Wave Form** (P.54)

 (*5) **Handset Reference Drawing** (P.64)

 (*6) **Base Unit Reference Drawing** (P.63)

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

10.1.4.4. TEST RANGE Check

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

Item	BU (Base Unit) Check	HS (Handset) Check
Range Confirmation TX TEST (TX Power check) HS, BU Mode: [Test Link Mode] (*1)	1. Register Regular HS to BU (to be checked). 2. Set BU to "Test Link mode". 3. Set Regular HS to "Test Link mode". *Set TX Power and RX Sensitivity of the BU and the Regular HS by CHART1. * At distance of about 5 m between HS and BU, Link OK = TX Power of the BU is OK. No Link = TX Power of the BU is NG.	1. Register HS (to be checked) to Regular BU. 2. Set Regular BU to "Test Link mode". 3. Set HS to "Test Link mode". *Set TX Power and RX Sensitivity of the HS and the Regular BU by CHART1. * At distance of about 20 m between HS and BU, Link OK = TX Power of the HS is OK. No Link = TX Power of the HS is NG.
Range Confirmation RX TEST (RX sensitivity check) HS, BU Mode: [Test Link Mode] (*1)	1. Register Regular HS to BU (to be checked). 2. Set BU to "Test Link mode". 3. Set Regular HS to "Test Link mode". *Set TX Power and RX Sensitivity of the BU and Regular HS by CHART1. * At distance of about 5 m between HS and BU, Link OK= RX Sensitivity of the BU is OK. No Link = RX Sensitivity of the BU is NG.	1. Register HS (to be checked) to Regular BU. 2. Set Regular BU to "Test Link mode". 3. Set HS to "Test Link mode". * Set TX Power and RX Sensitivity of Checking_HS and Regular_BU by CHART1. * At distance of about 5 m between HS and BU, Link OK= RX Sensitivity of the HS is OK. No Link = RX Sensitivity of the HS is NG

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

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

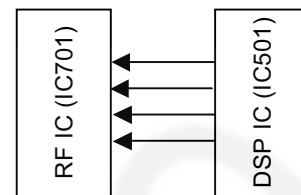
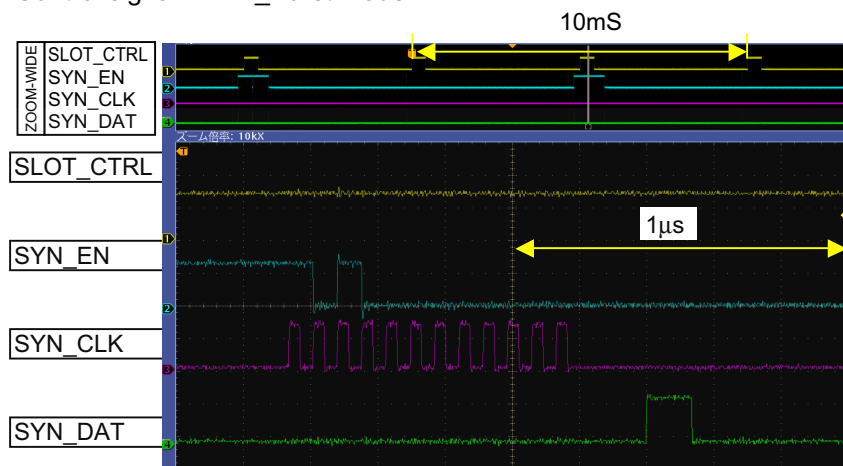
	HS (to be checked)		Regular_BU	
	TX Power	RX Sens.	TX Power	RX Sens.
HS (Handset) TX Power Check	High	High	High	High
HS (Handset) RX Sensitivity Check	High	High	Low	High

Note:

(*1) **Adjustment and Test Mode Flow Chart (P.38)**

10.1.4.5. RF-DSP Interface Signal Wave Form

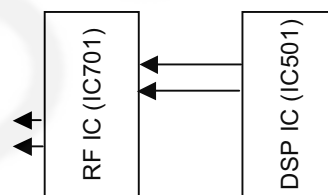
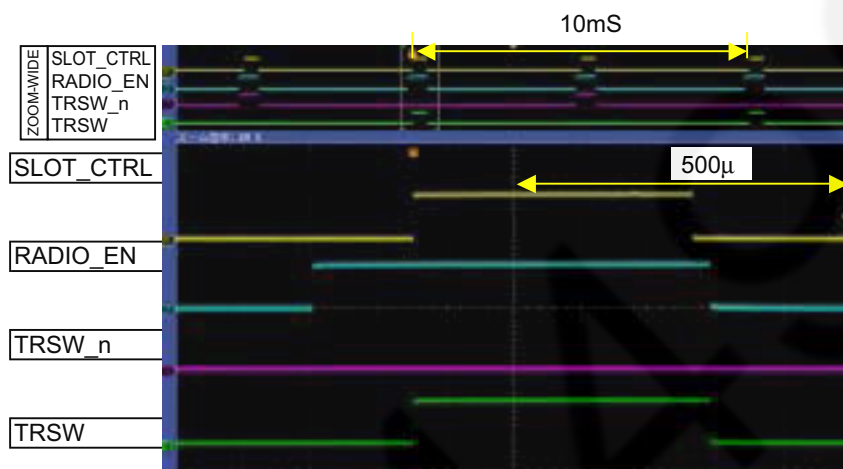
Control signal in TX_Burst mode



Pin Number

Signal	IC701	IC501	
	BS/HS	BS	HS
SLOT_CTRL	22	19	21
SYN_EN	25	28	30
SYN_CLK	24	29	31
SYN_DAT	23	30	32

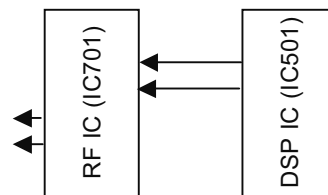
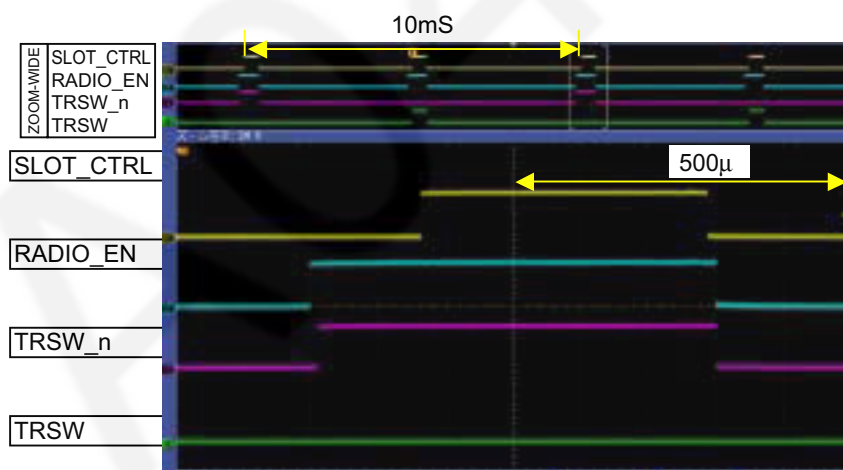
TRSW signal of TX zone in TX_Burst mode



Pin Number

Signal	IC701	IC501	
	BS/HS	BS	HS
SLOT_CTRL	22	19	21
RADIO_EN	21	24	26
TRSW_n	11	-	-
TRSW	6	-	-

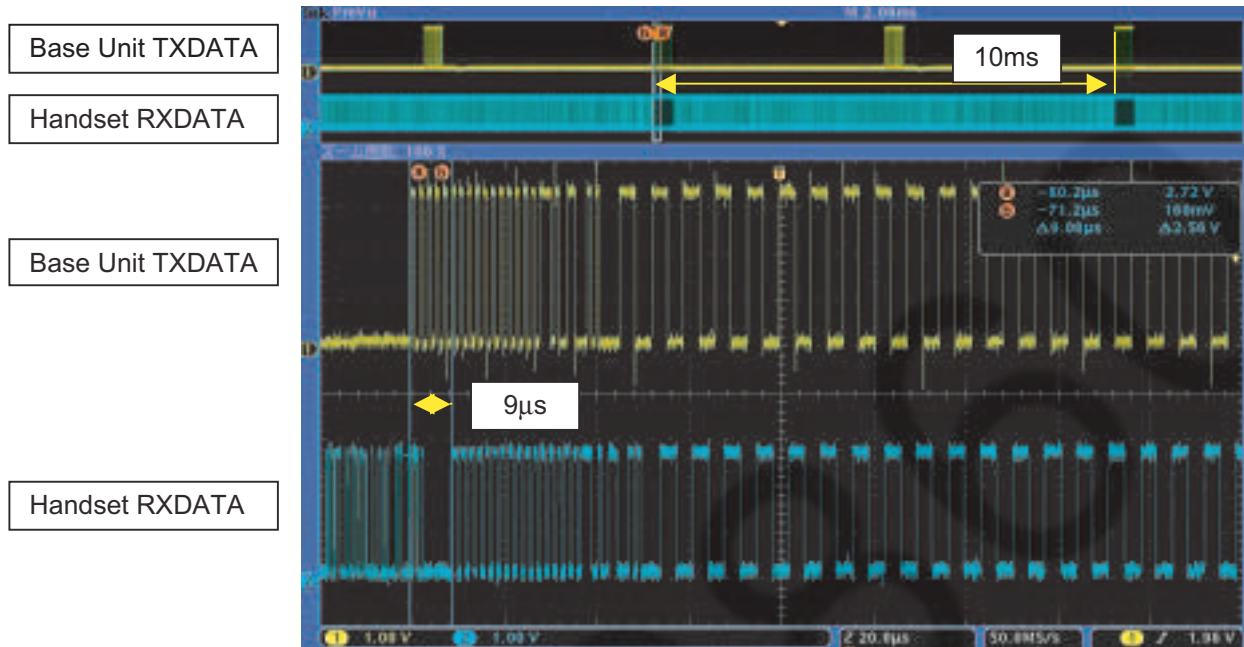
TRSW signal of RX zone in TX_Burst mode



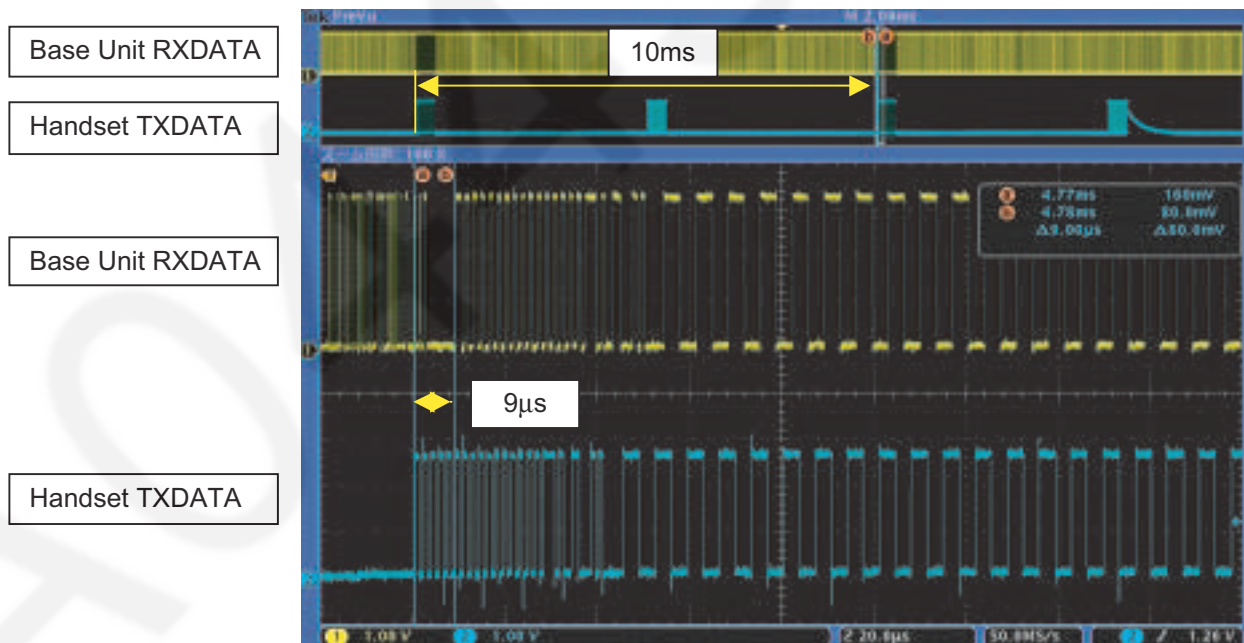
Pin Number

Signal	IC701	IC501	
	BS/HS	BS	HS
SLOT_CTRL	22	19	21
RADIO_EN	21	24	26
TRSW_n	11	-	-
TRSW	6	-	-

Base Unit TXDATA and Handset RXDATA on TXO signal-line
(TX Confirmation of BS or RX confirmation of HS)



Handset TXDATA and Base unit RXDATA on TXO signal-line
(RX Confirmation of BS or TX confirmation of HS)



10.1.5. Check Handset Transmission

Check MIC of handset.



Check handset Tx in **Signal Route**.

Cross Reference:

Signal Route (P.26)

10.1.6. Check Handset Reception

Check speaker of handset.



Check handset Rx in **Signal Route**.

Cross Reference:

Signal Route (P.26)

Note:

When checking the RF part, Refer to **Check the RF part** (P.49).

10.1.7. Check Caller ID

BASE UNIT

Did bell ring?
(Message indicator
blinks)

NO

Check bell signal detection in
Telephone Line Interface.

YES

Check **Calling Line Identification (Caller ID)/
Call Waiting Caller ID**.

Cross Reference:

Telephone Line Interface (P.15)

Calling Line Identification (Caller ID)/Call Waiting Caller ID (P.17)

Note:

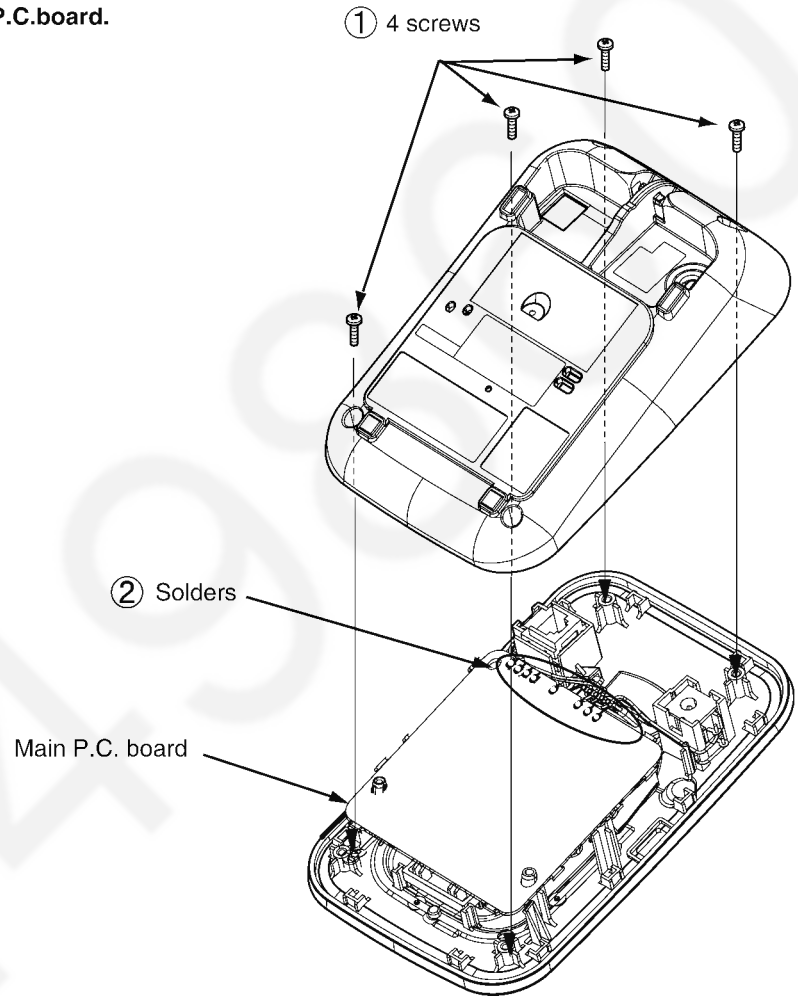
- Make sure the format of the Caller ID service of the Telephone company that the customer subscribes to.
- It is also recommended to confirm that the customer is really a subscriber of the service.

11 Disassembly and Assembly Instructions

11.1. Disassembly Instructions

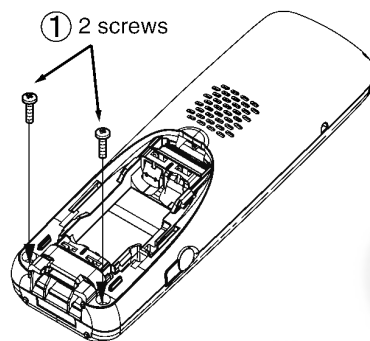
11.1.1. Base Unit

- ① Remove the 4 screws to remove the cabinet cover.
- ② Remove solders to remove the main P.C.board.

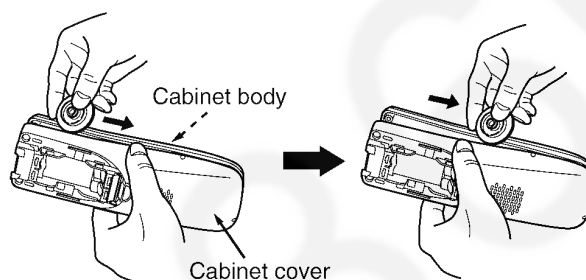


11.1.2. Handset

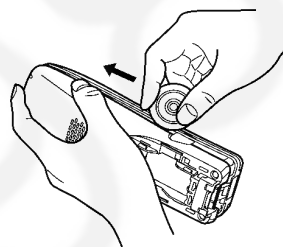
- ① Remove the 2 screws.



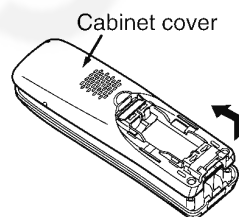
- ② Insert a JIG (PQDJ10006Y) between the cabinet body and the cabinet cover, then pull it along the gap to open the cabinet.



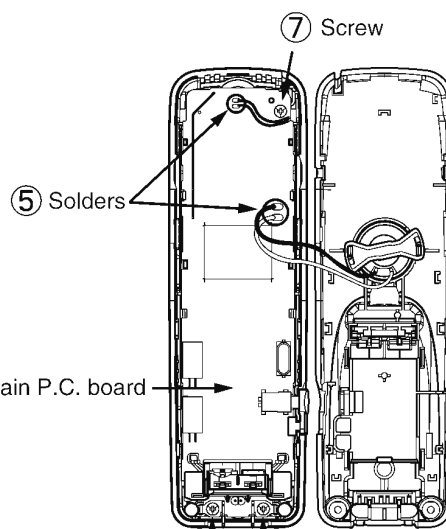
- ③ Likewise, open the other side of the cabinet.



- ④ Remove the cabinet cover by pushing it upward.



- ⑤ Remove the solders.



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

Main P.C. board

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

⑥ 2 charge terminals

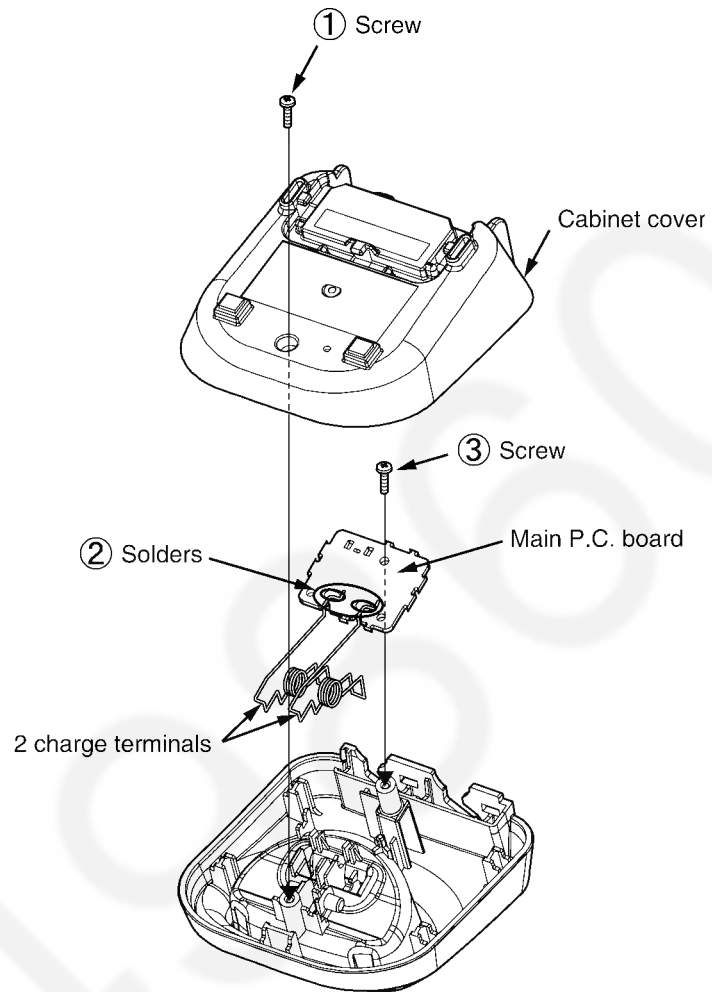
⑥ 2 screws

11.1.3. Charger Unit

- ① Remove the screw to remove the cabinet cover.

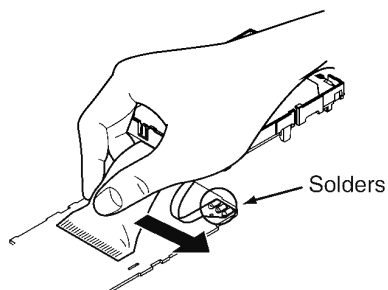
- ② Remove the solders to remove the 2 charge terminals.

- ③ Remove the screw to remove the main P.C. board.



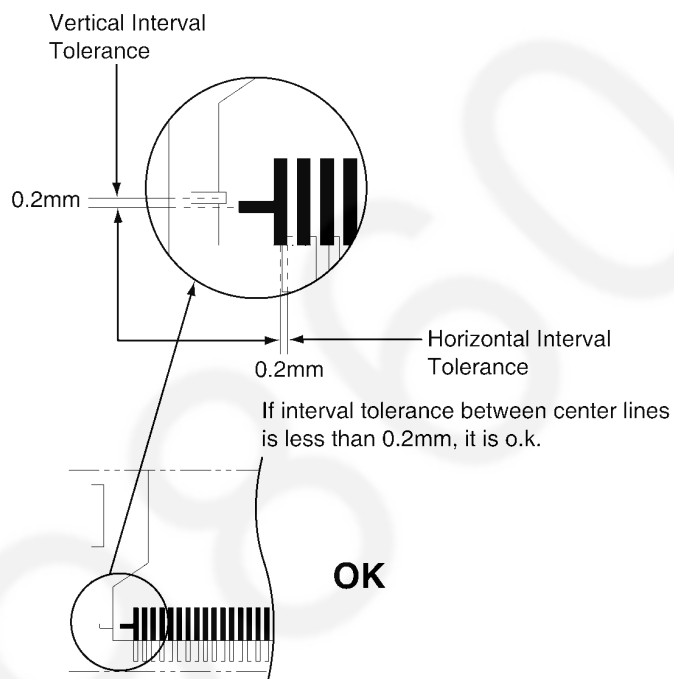
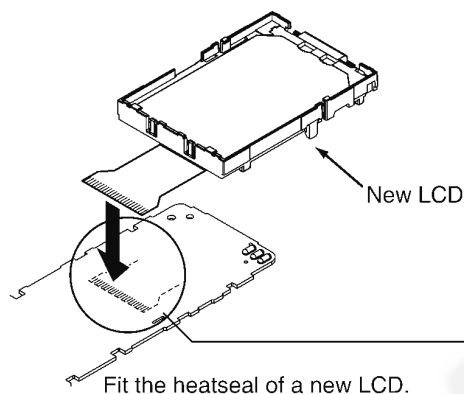
11.2. How to Replace the Handset LCD

①

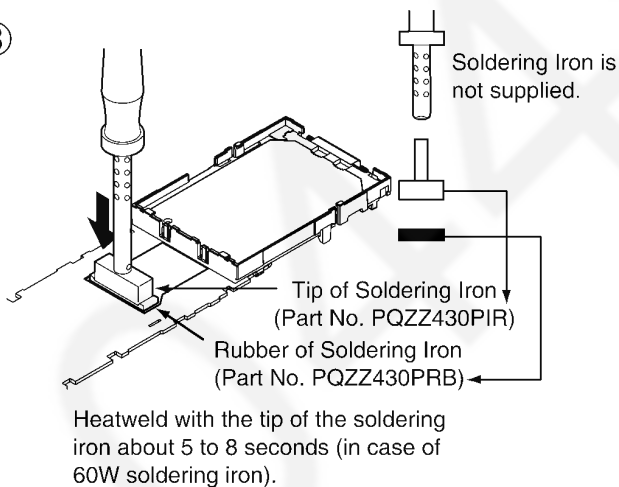


Remove the solders of the FPC (Flexible Printed Circuit), then peel off the FPC (Flexible Flat Cable) from the P.C. board, in the direction of the arrow. Take care to ensure that the foil on the P.C. board is not damaged.

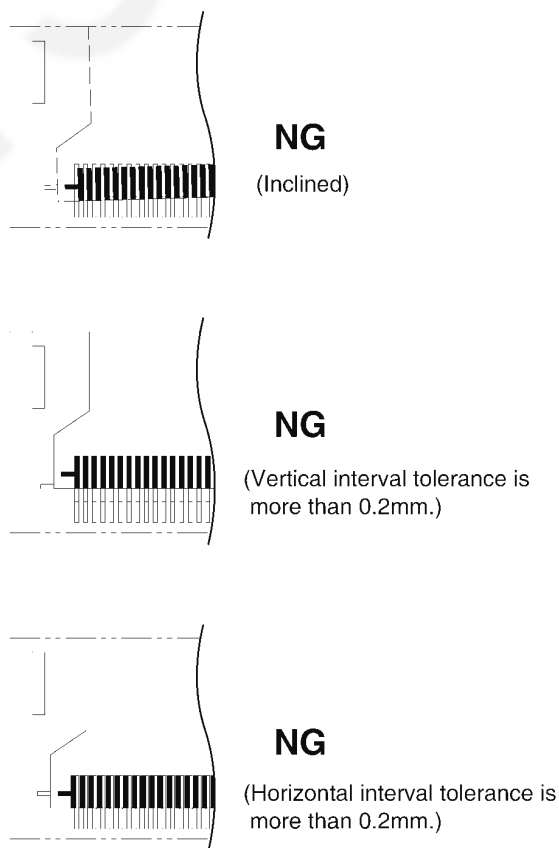
②



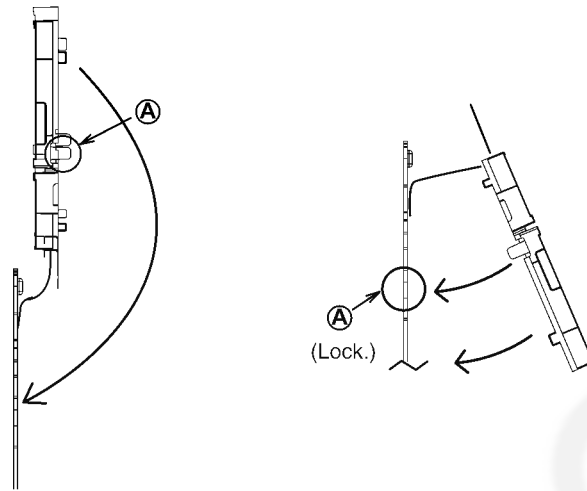
③



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

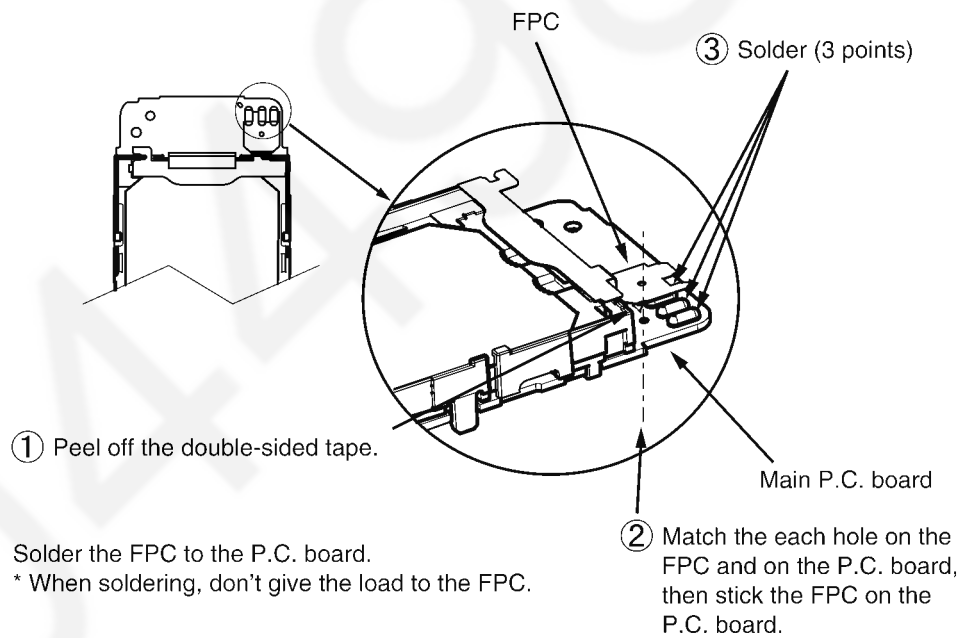


④



Attach LCD to P.C.B. and lock with part of ④.

⑤



12 Measurements and Adjustments

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

12.1.1. Preparation

Equipment: Frequency counter

Check Point for measurement: BCK

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

12.1.2. Check and Adjust Frequency (Base Unit)

1. Set up base unit in TEST mode.
2. Press following keys in order to Adjust Crystal mode. [LOCATOR], [LOCATOR], [LOCATOR], [Button 1] (*1), [LOCATOR].
Check BCK frequency.
3. If the BCK frequency is out of the checking tolerance ($\pm$ 100 Hz), adjust to Adjustment tolerance ($\pm$ 30 Hz) by pressing [Button1] (*1) or [Button 2] (*1) key.
Adjustment Tolerance: 13.824 MHz $\pm$ 30 Hz
4. Press [LOCATOR] key to write the new frequency factor in Memory.
5. Turn the power off. Then this value is available.

Note:

(*1) When you check test mode, connect to the external Buttons because Base Unit has only LOCATOR key. Refer to **Bottom View** (P.86).

-Insert AC adaptor during checking.

Cross Reference:

Adjustment Mode for Base Unit (P.40)

12.1.3. Check and Adjust Frequency (Handset)

1. Set DC power supply to 2.6 V.
2. Set up handset in TEST mode (Adjustment flow).
3. Press [1] key to Adjust Crystal mode ("Clock Adj." is displayed on LCD). Check BCK frequency.
4. If the BCK frequency is out of the checking tolerance ($\pm$ 100 Hz), adjust to Adjustment tolerance ($\pm$ 30 Hz) by pressing [▲] or [▼] key.
Adjustment Tolerance: 13.824 MHz $\pm$ 30 Hz
5. Press [TALK] key to write the new frequency factor in EEPROM.
6. Turn the power off. Then this value is available.

Cross Reference:

Adjustment Mode for Handset (P.44)

12.1.4. Adjust Battery Low Detector Voltage (Handset)

After handset's DSP (IC501) or EEPROM (IC541) replacement, Re-writing Battery Low voltage to EEPROM is required.
With following handset Adjustment Flow, adjust DC power supply and DC voltmeter by the procedure below.

1. Set DC power supply to 2.6 V.
2. Set up handset in TEST mode (Adjustment flow).
3. Press [1] key and [OFF] key to Adjust Batt Low mode. ("Bat Adj." is displayed on LCD)
4. Change the voltage of the DC power supply to 2.34 V accurately. Check the voltage at P.C. board pads because some voltage drops occur due to the usage of long or thin cables.
5. Press [TALK] key twice to write voltage value in EEPROM.
6. Press [TALK] key twice to write charge value 1 in EEPROM.
7. Change the voltage of the DC power supply to 3.1 V accurately.
8. Press [TALK] key twice to write charge value 2 in EEPROM.
9. Change the voltage of the DC power supply to 3.6 V accurately.
10. Press [TALK] key twice to write primary battery detect value in EEPROM.
11. Turn the power off. Then this value is available.

Note:

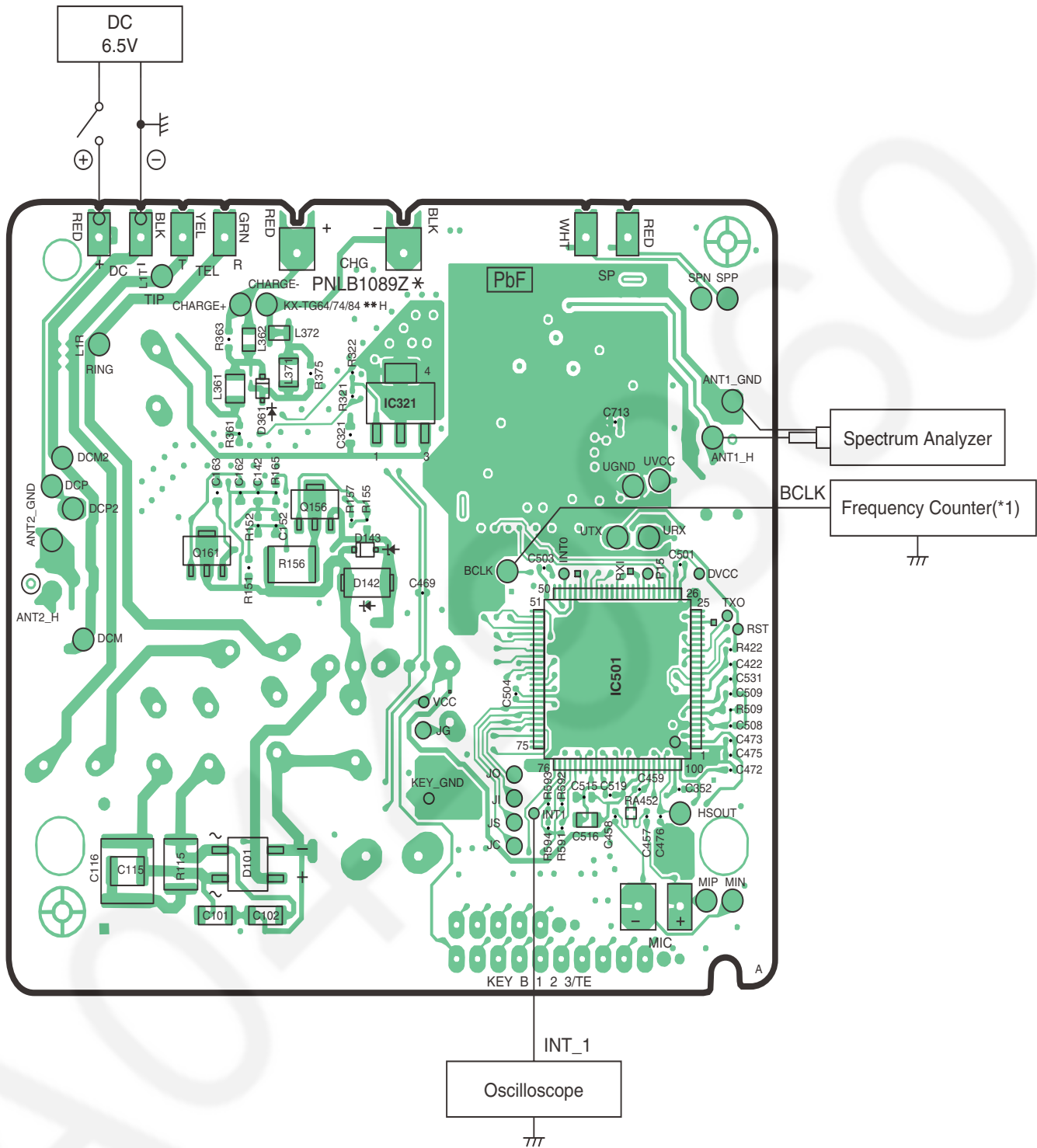
Refer to **Handset Reference Drawing** (P.64) for connection of DC power supply and voltmeter.

Cross Reference:

Adjustment Mode for Handset (P.44)

12.2. Base Unit Reference Drawing

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



Note:

(*1) is referred to No.3 of **Check Table for RF part** (P.52).

[illegible]

64

12.4. Frequency Table

	Ch. (hex)	TX/RX Frequency (MHz)
Channel 0	00	1928.448
Channel 1	01	1926.720
Channel 2	02	1924.992
Channel 3	03	1923.264
Channel 4	04	1921.536
Channel 5	05	1919.808
Channel 6	06	1918.080
Channel 7	07	1916.352
Channel 8	08	1914.624
Channel 9	09	1912.896

13 Miscellaneous

13.1. CPU Data (Base Unit)

13.1.1. IC501

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

PIN	I/O	Description	High	High_Z	Low
60	D.O	NC	--	--	--
61	D.O	NC	--	--	--
62	D.O	NC	--	--	--
63	D.I	KEY_IN3	Non	--	Key In
64	D.I	KEY_IN2	Non	--	Key In
65	D.I	KEY_IN1	Non	--	Key In
66	GND	GND	--	--	GND
67	VCC	VCC	VCC	--	--
68	D.O	TCK	--	--	--
69	D.I	TMS	--	--	--
70	D.O	TDI	--	--	--
71	D.O	TD0	--	--	--
72	D.O	NC	--	--	--
73	D.O	NC	--	--	--
74	D.O	NC	--	--	--
75	D.O	NC	--	--	--
76	D.O	NC	--	--	--
77	D.O	NC(INT1)	--	--	--
78	D.O	NC	--	--	--
79	D.O	NC	--	--	--
80	D.O	NC	--	--	--
81	D.O	UART_TX	High	--	Low
82	D.I	UART_RX	High	--	Low
83	D.O	NC	--	--	--
84	GND	GND	--	--	GND
85	A.I	PDN	--	--	--
86	A.I	DCIN1	--	--	--
87	A.O	VREF	--	--	--
88	A.I	MIP	--	--	--
89	A.I	MIN	--	--	--
90	A.I	DCIN2	--	--	--
91	A.I	NC	--	--	--
92	GND	GNDA	--	--	--
93	A.I	NC	--	--	--
94	A.I	NC	--	--	--
95	VCC	VCCA	--	--	--
96	A.I	LIN0	--	--	--
97	A.O	LOUT0	--	--	--
98	A.O	NC	--	--	--
99	VCC	VCCPA	--	--	--
100	A.O	NC	--	--	--

Note:

- The mark "*" in the I/O column means the port is controlled by the firmware.

13.2. CPU Data (Handset)

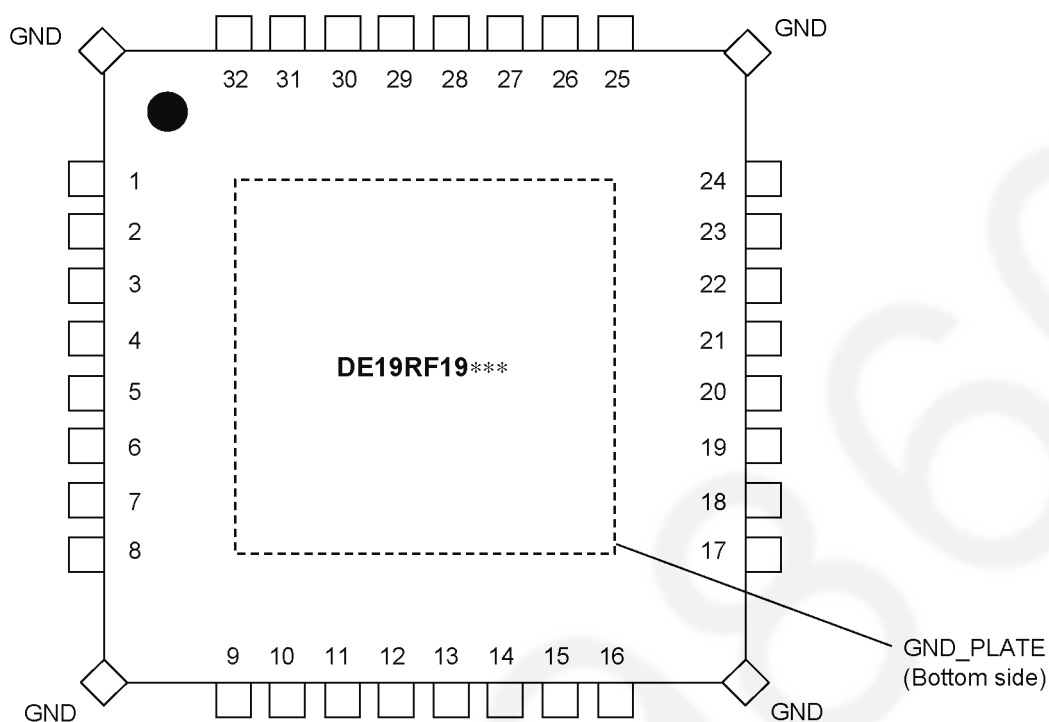
13.2.1. IC501

PIN	Description	I/O	High	High_Z	Low
1	GND1(GNDPA)	GND	--	--	--
2	SPP2	A.O	--	--	--
3	BCLK	A.O	--	--	--
4	(NC)	-	--	--	--
5	XIN	A.I	--	--	--
6	XOUT	A.O	--	--	--
7	VDD	VDD	--	--	--
8	VCCIN	VCC	--	--	--
9	GND2	GND	--	--	--
10	GND3	GND	--	--	--
11	GND4	A.I	--	--	--
12	GND5	A.O	--	--	--
13	RST	A.O	Nonactive	--	Active
14	(FL_RST)	D.O	Active	--	--
15	(FL_SO)	D.O	--	--	--
16	(FL_DI)	D.O	--	--	--
17	(FL_CS)	D.O	--	--	--
18	(NC)	D.O	--	--	--
19	SYN_OUT	D.I	--	--	--
20	TX_DATA	D.O	--	--	--
21	SLOT_CTRL	D.O	--	--	--
22	(NC)	D.O	--	--	--
23	RF_POWER	D.O	--	--	--
24	(NC)	D.O	--	--	--
25	RF_RSTN	D.O	Active	--	Nonactive
26	RADIO_EN	D.O	--	--	--
27	HEAD_DET	D.I	Nonactive	--	Active
28	GND6	GND	--	--	--
29	VCC1	VCC	--	--	--
30	SYN_LE	D.O	--	--	--
31	SYN_CLK	D.O	--	--	--
32	SYN_DATA	D.O	--	--	--
33	(NC)	D.O	--	--	--
34	TX_EN	D.O	Active	--	Nonactive
35	KEY_BL_LED	D.O	Active	--	--
36	RX_DATA	D.I	--	--	--
37	(NC)	D.I	--	--	--
38	CHG_DET	D.I	Nonactive	--	Active
39	(NC)	D.I	--	--	--
40	LCD_BACK_LIGHT	D.O	Active	--	Nonactive
41	(NC)	D.O	--	--	--
42	CHG_CTL	D.O	Active	Nonactive	--
43	(NC)	D.O	--	--	--
44	(NC)	D.O	--	--	--
45	(NC)	D.O	--	--	--
46	SCL	D.O	--	--	--
47	SID	D.O	--	--	--
48	GND7	GND	--	--	--
49	VCC2	VCC	--	--	--
50	RESET	D.O	Nonactive	--	Active
51	(FL_CLK)	D.O	--	--	--
52	CI	D.O	--	--	--
53	(NC)	D.O	--	--	--
54	(NC)	D.O	--	--	--
55	ANT_LED	D.O	Active	--	Nonactive
56	A0	D.O	--	--	--
57	(NC)	D.O	--	--	--
58	(NC)	D.O	--	--	--
59	LCD_POWER	D.O	Active	--	Nonactive
60	(NC)	D.O	--	--	--
61	CS1	D.O	--	--	--
62	(NC)	D.O	--	--	--

PIN	Description	I/O	High	High_Z	Low
63	KEYSTROBE_E	D.O	--	Nonactive	Active
64	KEYSTROBE_D	D.O	--	Nonactive	Active
65	KEYSTROBE_C	D.O	--	Nonactive	Active
66	KEYSTROBE_B	D.O	--	Nonactive	Active
67	KEYSTROBE_A	D.O	--	Nonactive	Active
68	GND8	GND	--	--	--
69	VCC3	VCC	--	--	--
70	TEST_CLK	D.I	--	--	--
71	TEST_MODE_SELECT	D.I	--	--	--
72	TEST_DATA_IN	D.I	--	--	--
73	TEST_DATA_OUT	D.O	--	--	--
74	KEYIN_1	D.I	Nonactive	--	Active
75	KEYIN_2	D.I	Nonactive	--	Active
76	KEYIN_3	D.I	Nonactive	--	Active
77	KEYIN_4	D.I	Nonactive	--	Active
78	KEYIN_5	D.I	Nonactive	--	Active
79	FB1	D.O	--	--	--
80	FB2	D.O	--	--	--
81	EEPROM_CLK	D.O	--	--	--
82	EEPROM_DATA	D.I.O	--	--	--
83	UART_TX	D.O	--	--	--
84	UART_RX	D.I	--	--	--
85	EEPROM_WP	D.O	Active	--	Nonactive
86	GND9	GND	--	--	--
87	PDN	A.I	--	--	--
88	IBAT1	A.I	--	--	--
89	VREF	A.O	--	--	--
90	MIP	A.I	--	--	--
91	MIN	A.I	--	--	--
92	MICBIAS	A.I	--	--	--
93	GND10 (GNDA)	GND	--	--	--
94	VCCA	VCC	--	--	--
95	HS_MIC_IN	A.I	--	--	--
96	IBAT2	A.I	--	--	--
97	SPP1	A.O	--	--	--
98	SPN	A.O	--	--	--
99	VCC4 (VCCPA)	VCC	--	--	--
100	SP_OUT_N	A.O	--	--	--

13.3. Explanation of IC Terminals (RF Part)

13.3.1. IC701



Pin	Description	I/O
1	VCC_VCO	VCC
2	PAEN	O
3	ATST_p	O
4	ATST_n	O
5	ANT_n	O
6	TRSW	O
7	RXp	I
8	RXn	I
9	TX_p	O
10	TX_n	O
11	TRSW_n	O
12	ANT	O
13	VCC_FE	VCC
14	VDD_IF	VCC
15	VCC_IF	VCC
16	VDD_DIG_b	VCC
17	VCC_DIG	VCC

Pin	Description	I/O
18	RSTN	I
19	VCC_IO	VCC
20	TR_DATA	I/O
21	RADIOEN	I
22	SLOT_CTRL	I
23	SYN_DAT	I
24	SYN_CLK	I
25	SYN_EN	I
26	SYN_OUT	O
27	VDD_DIG_t	VCC
28	DTEST	O
29	DTST1	O
30	REF_IN	I
31	VCC_DIV	VCC
32	VCC_PLL	VCC
GND_PLATE		GND

13.4. How to Replace the Flat Package IC

13.4.1. 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.

- Flux

Recommended Flux: Specific Gravity → 0.82.

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

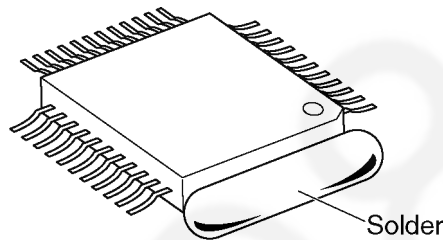
Note: See **About Lead Free Solder (PbF: Pb free)** (P.4).

13.4.2. How to Remove the IC

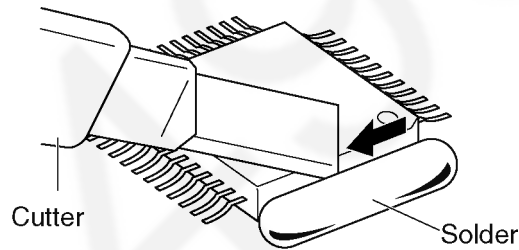
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

Note:

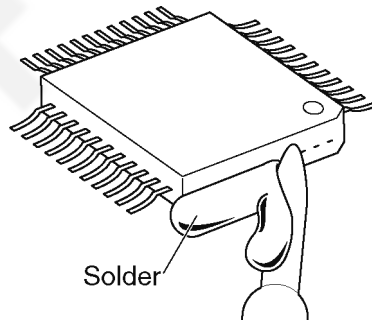
If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



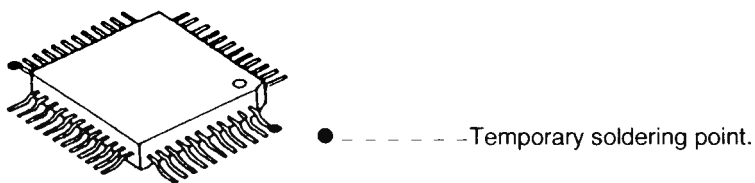
3. While the solder melts, remove it together with the IC pins.



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

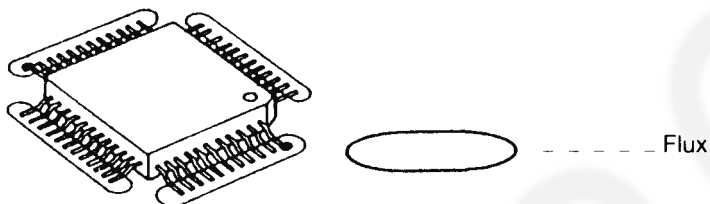
13.4.3. How to Install the IC

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

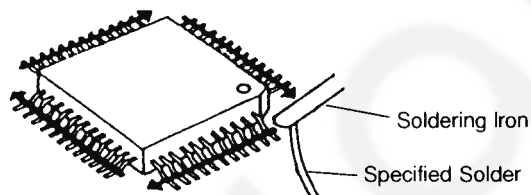


*Check the accuracy of the IC setting with the corresponding soldering foil.

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

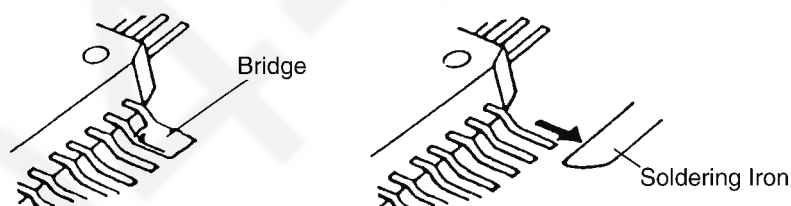


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



13.4.4. How to Remove a Solder Bridge

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



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

13.5.1. Preparation

- PbF (: Pb free) Solder
- Soldering Iron
Tip Temperature of 700 °F $\pm$ 20 °F (370 °C $\pm$ 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 $\pm$ 68 °F (320 °C $\pm$ 20 °C)

13.5.2. Caution

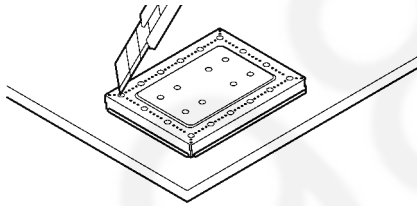
- To replace the IC efficiently, choose the right sized nozzle of the hot air desoldering tool that matches the IC package.
- Be careful about the temperature of the hot air desoldering tool not to damage the PCB and/or IC.

13.5.3. How to Remove the Shield Case

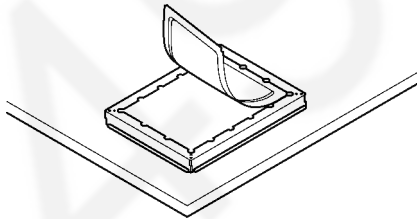
Note:

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

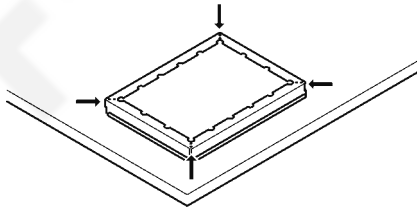
1. Cut the case along perforation.



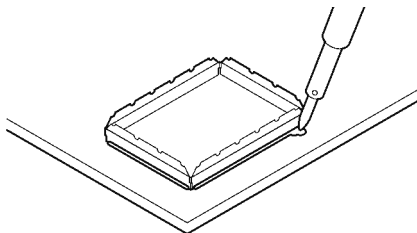
2. Remove the cut part.



3. Cut the four corners along perforation.



4. Remove the remains by melting solder.

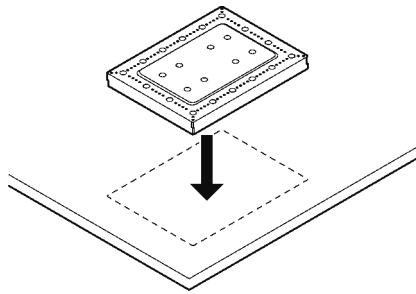


13.5.4. How to Install the Shield Case

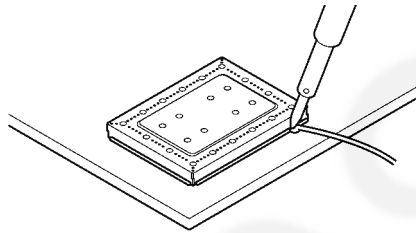
Note:

- If you don't have special tools (ex. Hot air disordering tool), conduct the following operations.
- Shield case's No. : PNMC1014Z

1. Put the shield case.

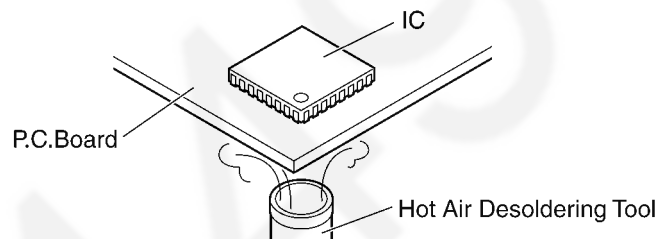


2. Solder the surroundings.



13.5.5. How to Remove the IC

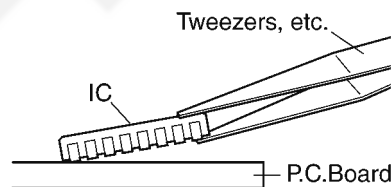
1. Heat the IC with a hot air desoldering tool through the P.C.Board.



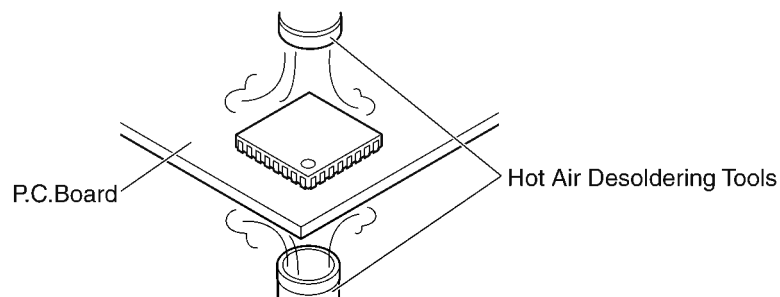
2. Pick up the IC with tweezers, etc. when the solder is melted completely.

Note:

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



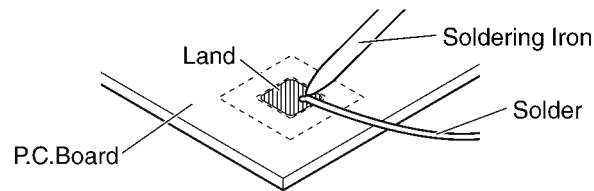
When it is hard to melt the solder completely, heat it with a hot air desoldering tool through the IC besides through the P.C.Board.



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

13.5.6. How to Install the IC

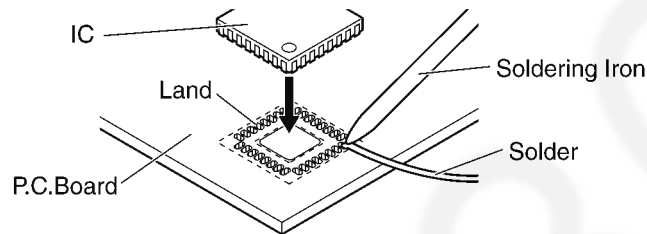
1. Place the solder a little on the land where the radiation GND pad on IC bottom is to be attached.



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

Note:

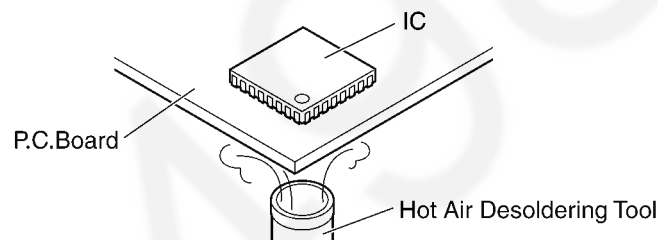
- When placing the IC, the positioning should be done very carefully.



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

Note:

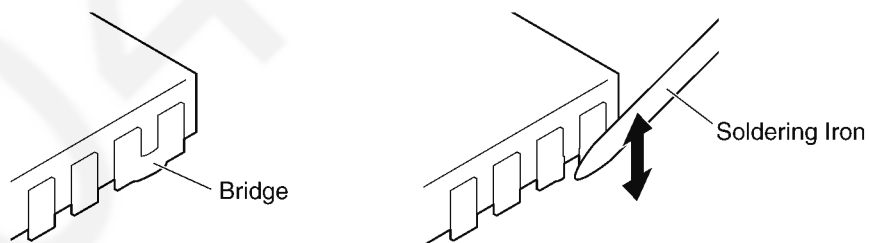
- Be sure to place it precisely, controlling the air volume of the hot air desoldering tool.



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

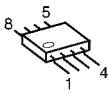
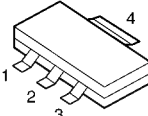
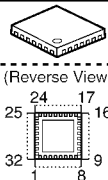
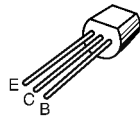
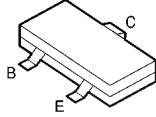
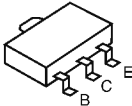
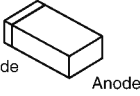
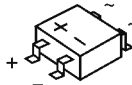
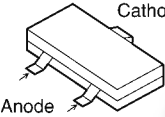
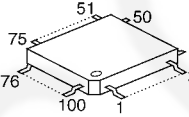
13.5.7. How to Remove a Solder Bridge

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

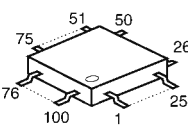
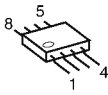
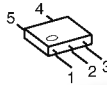
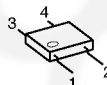
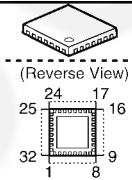
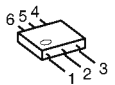
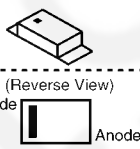
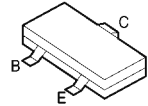
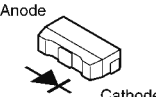
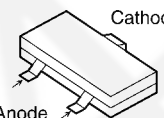


13.6. Terminal Guide of the ICs, Transistors and Diodes

13.6.1. Base Unit

 PNWIG6411MEH C0DBFGD00017	 C0CBAYG00016	 (Reverse View) C1CB00003088	 B1ACGP000008	 PQVTBF822T7 2SC6054JSL
 2SD0874AS	 Cathode Anode MA111, MA8220 B0JCME000035 MANV250GEL	 PQVDM5S	 Cathode Anode B0DDCD000001	 C2HBBY000099

13.6.2. Handset

 C2HBBY000103	 PNWIGA740MER	 C0DBGYY00297 C0CBCAC00252 C0DBAYY00067	 C0DBAYY00146 C0EBD0000355	 (Reverse View) C1CB00003088
 MTM767200LBF	Cathode  Anode MA8043L MA2ZD0200L	 (Reverse View) Cathode Anode B3ACB0000216	 B1ADGE000004, 2SC6054JSL UNR921MJ0L, UNR921EJ0L UNR9215J0L, UNR92AVJ0L	
Anode  Cathode B3AFB0000211	Cathode  Anode B0DDCD000001			

14 Schematic Diagram

14.1. For Schematic Diagram

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

Notes:

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

Important Safety Notice:

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

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

14.1.2. Handset (Schematic Diagram (Handset_Main))

Notes:

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

14.1.3. Charger Unit (Schematic Diagram (Charger Unit))

Notes:

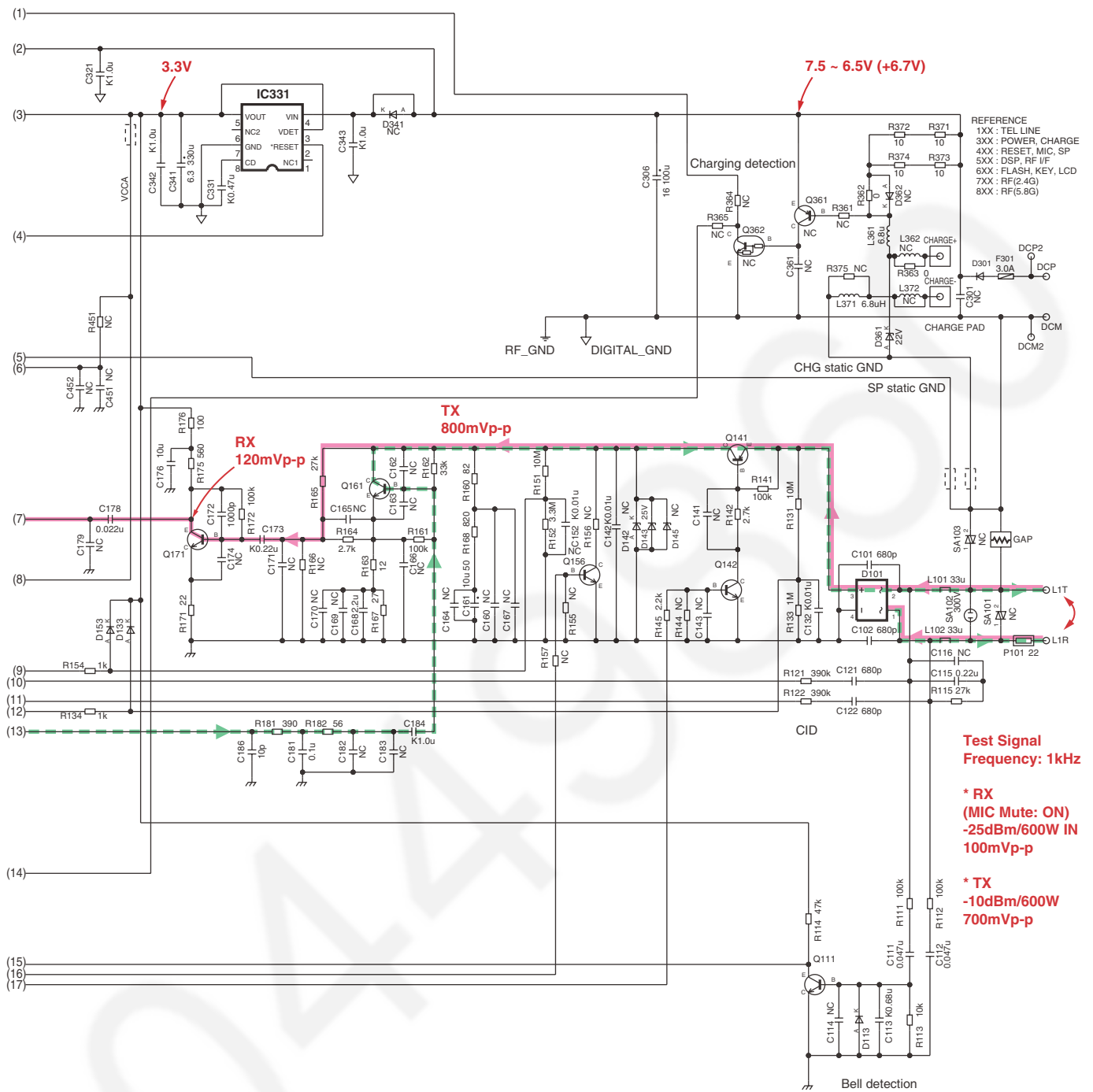
1. DC voltage measurements are taken with voltmeter from the negative voltage line.

Important Safety Notice:

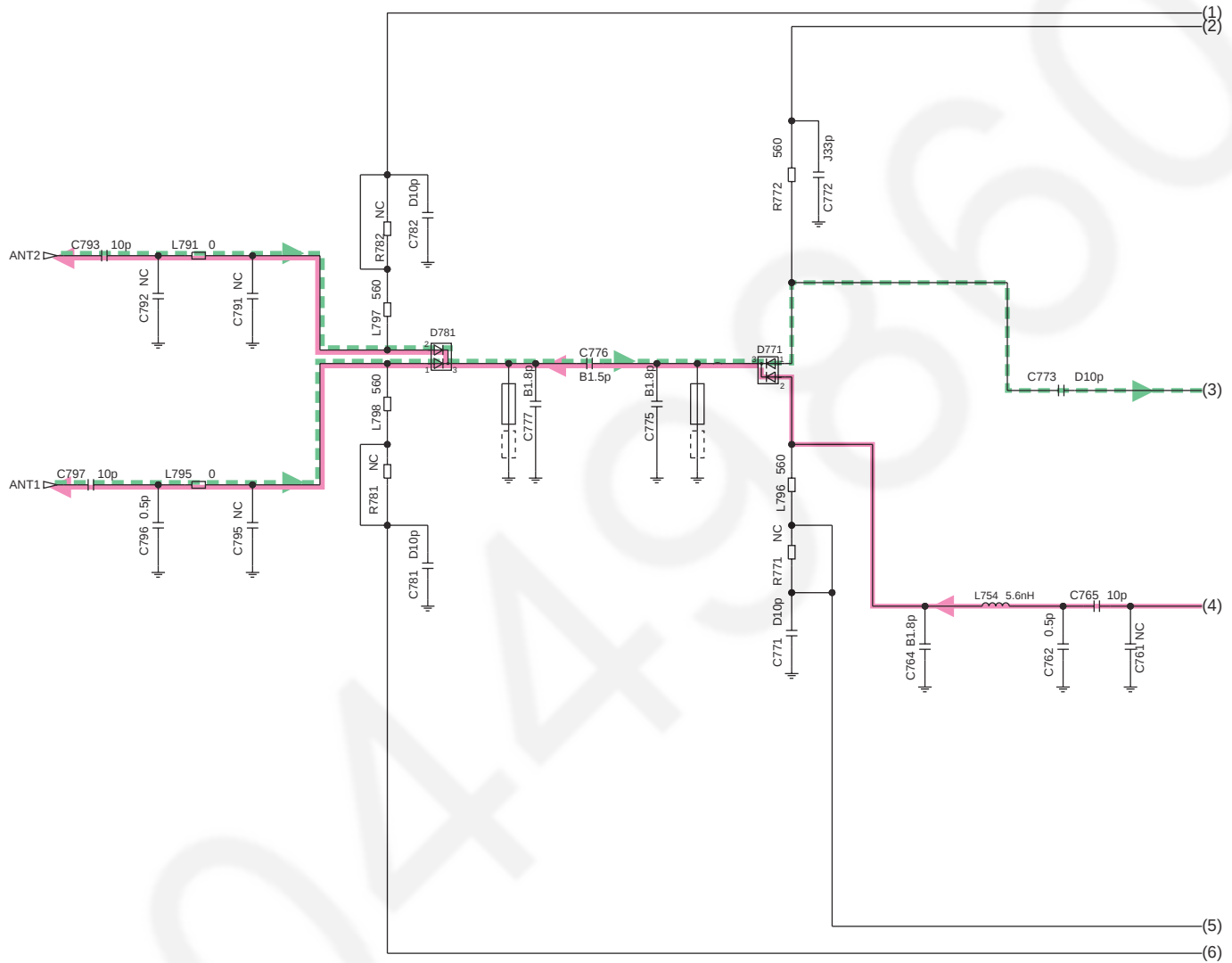
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

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

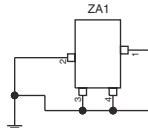




14.3. Schematic Diagram (Base Unit_RF Part)



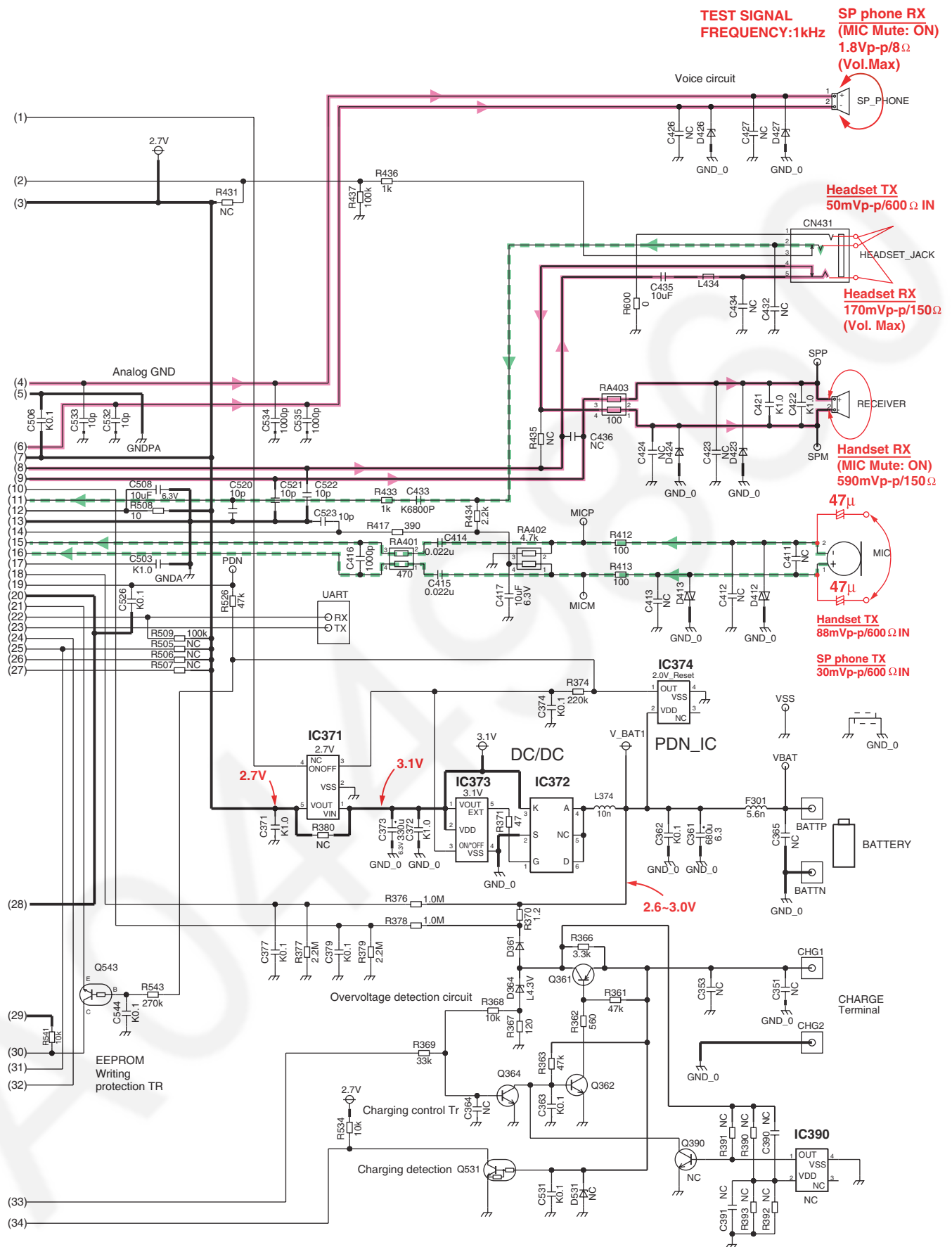
NC: No Components



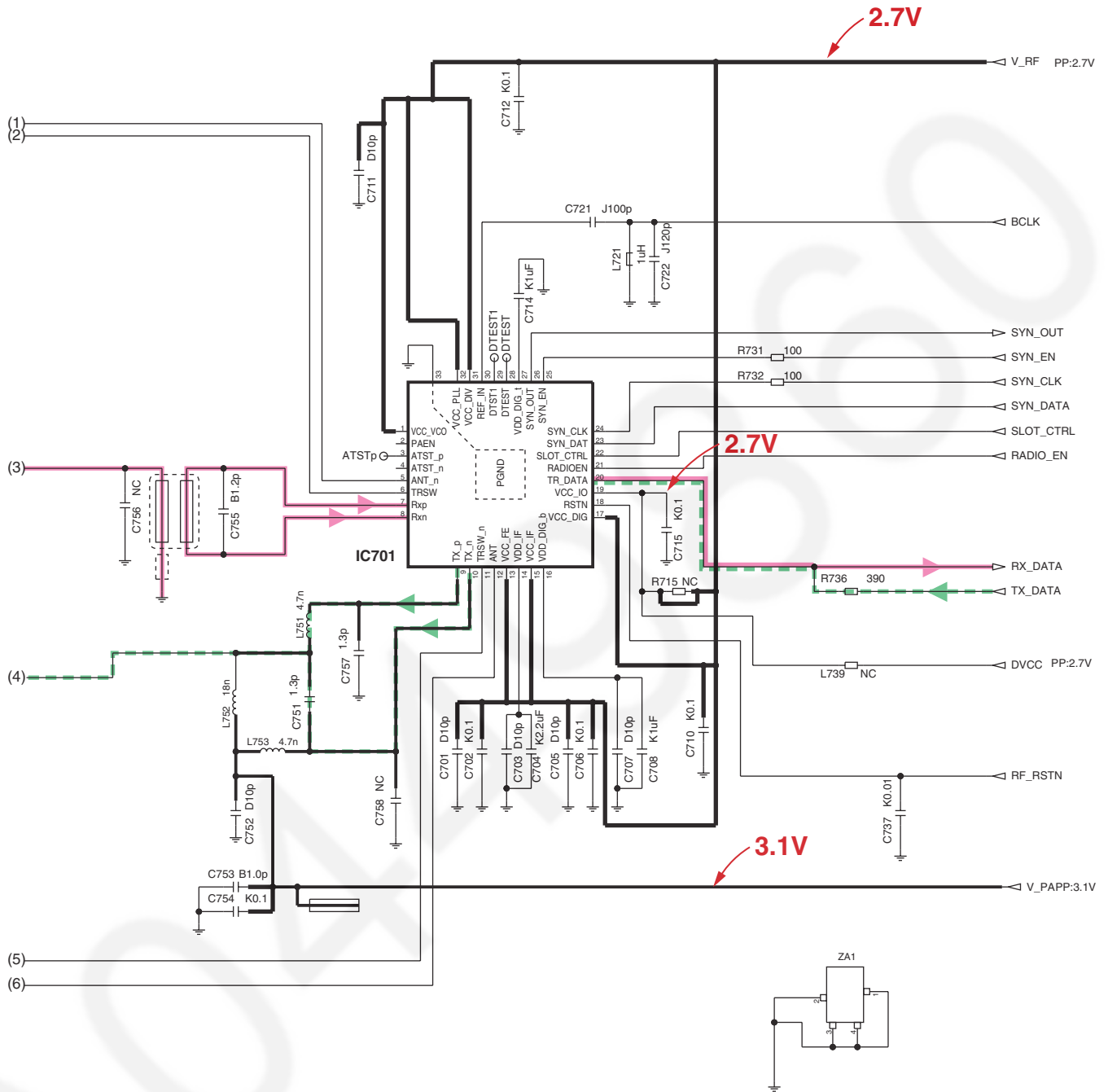
NC: No Components

KX-TG7411/7412 SCHEMATIC DIAGRAM (Base Unit_RF Part)





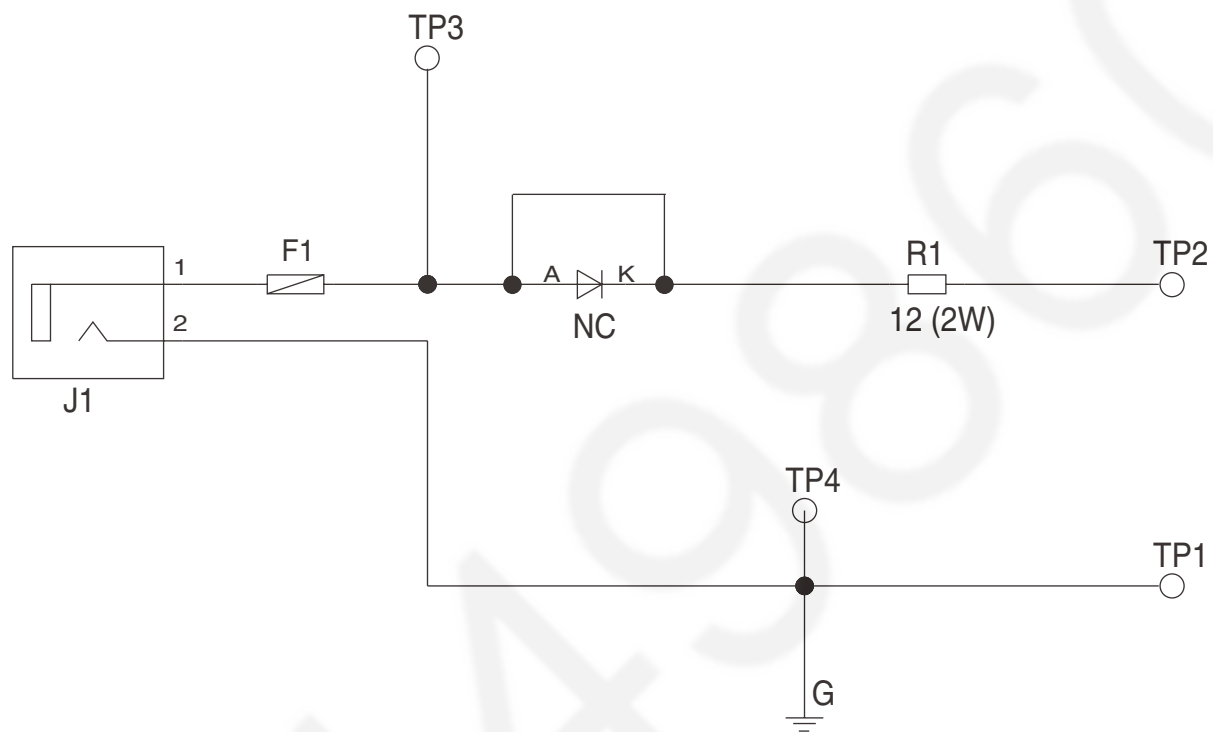




NC: No Components

KX-TGA740 SCHEMATIC DIAGRAM (Handset_RF Part)

14.6. Schematic Diagram (Charger Unit)

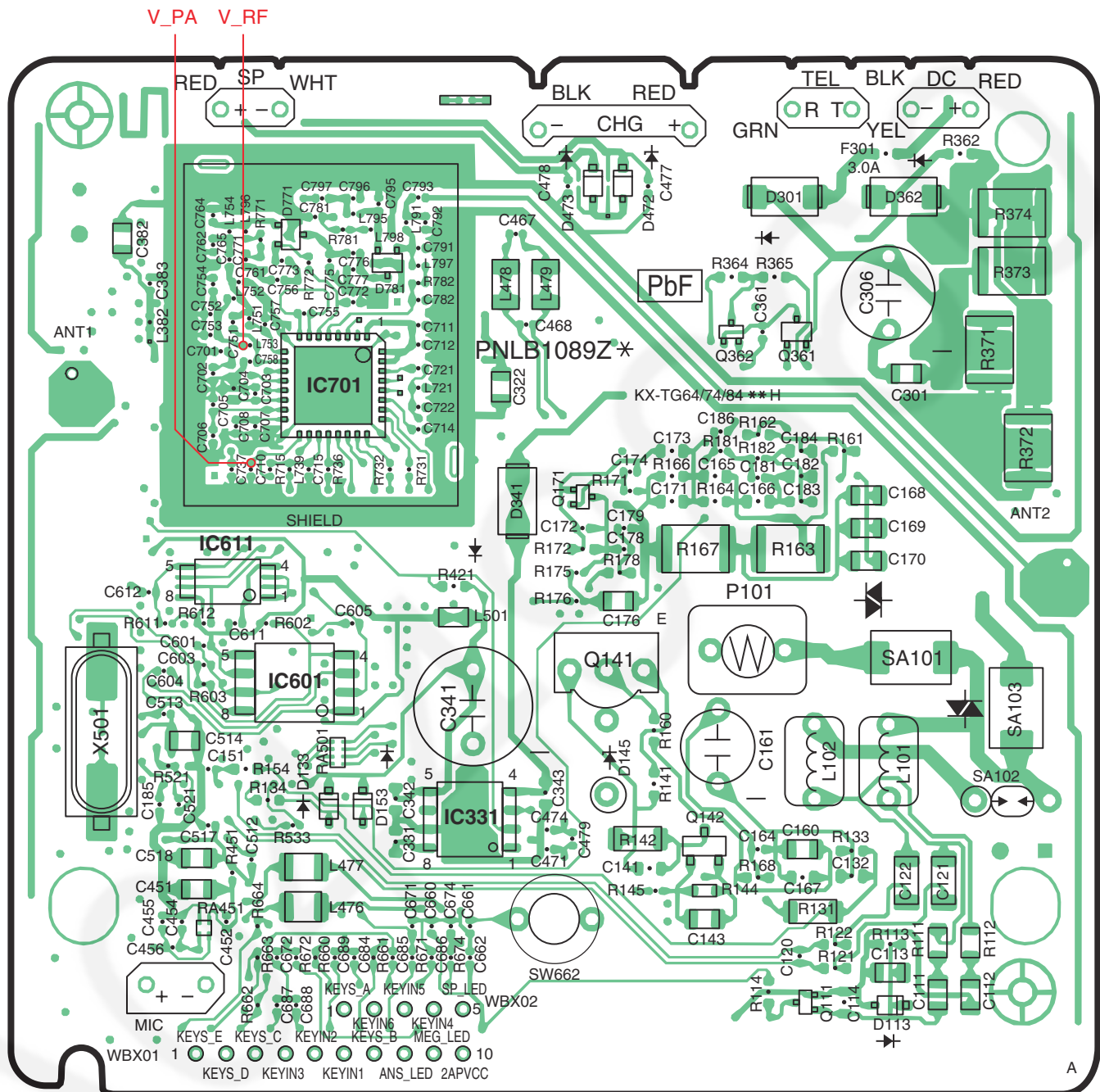


SCHEMATIC DIAGRAM (Charger Unit)

15 Printed Circuit Board

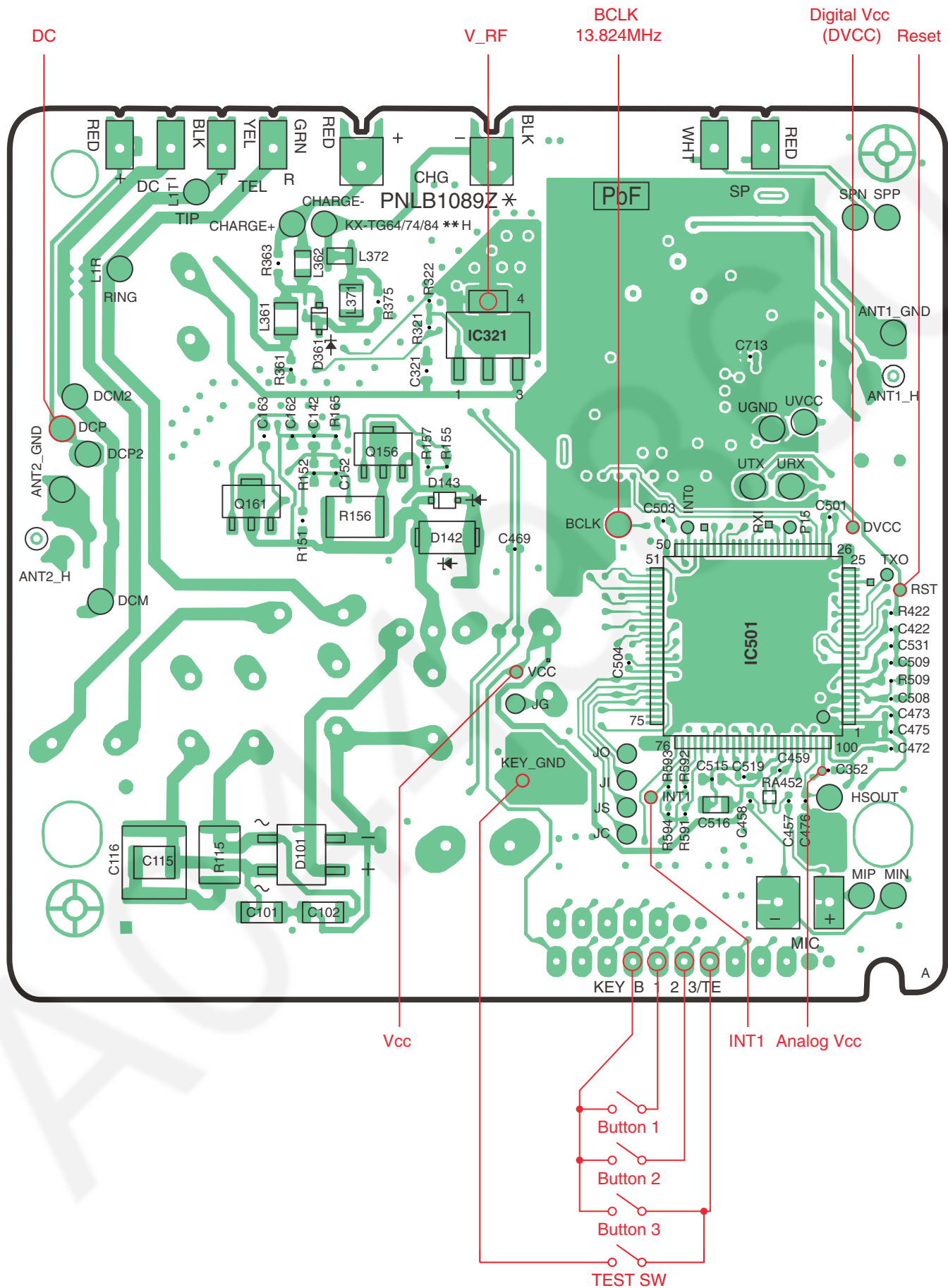
15.1. Circuit Board (Base Unit_Main)

15.1.1. Component View



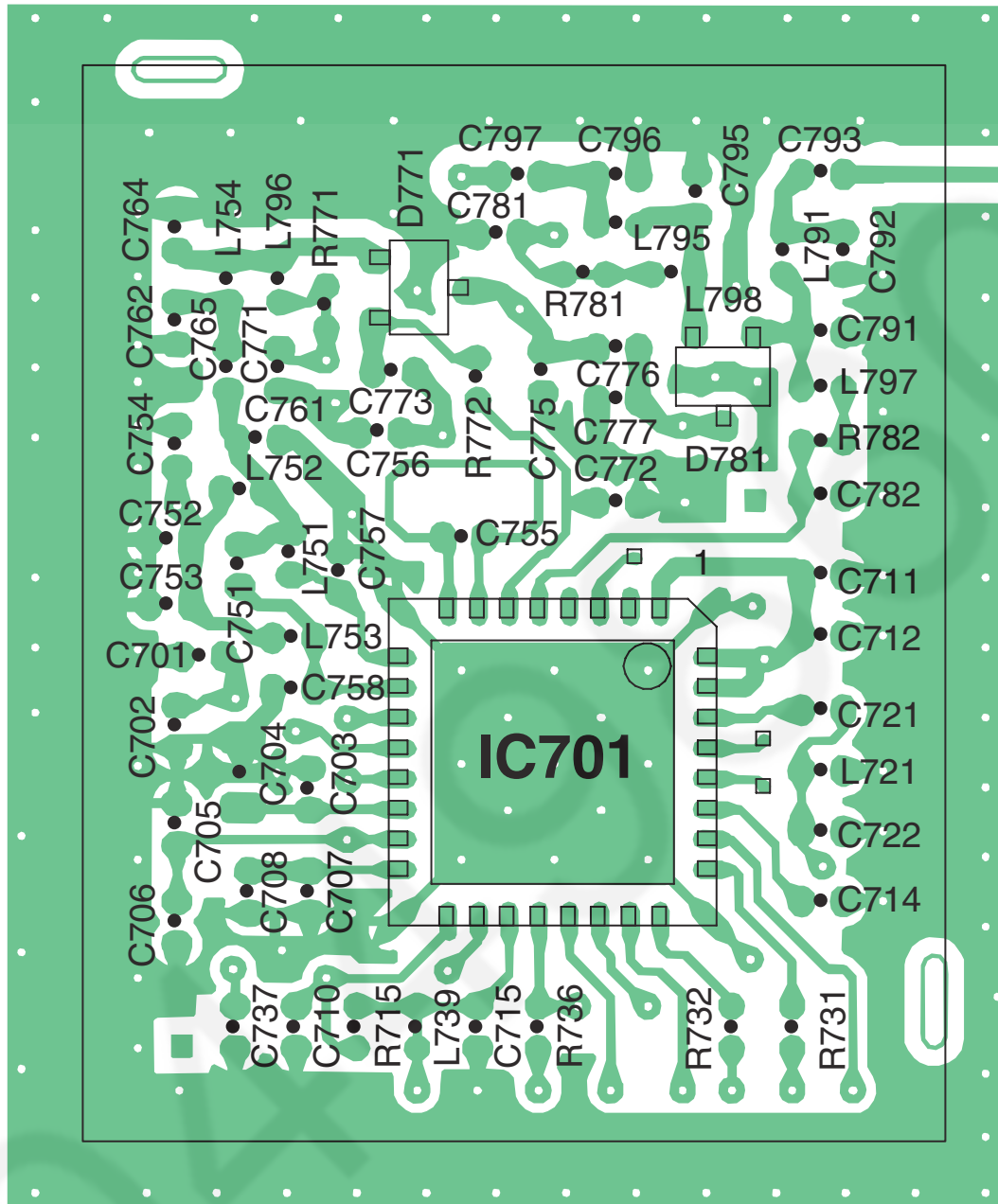
KX-TG7411/7412 CIRCUIT BOARD (Base Unit_Main (Component View))

15.1.2. Bottom View



KX-7411/7412 CIRCUIT BOARD (Base Unit_Main (Bottom View))

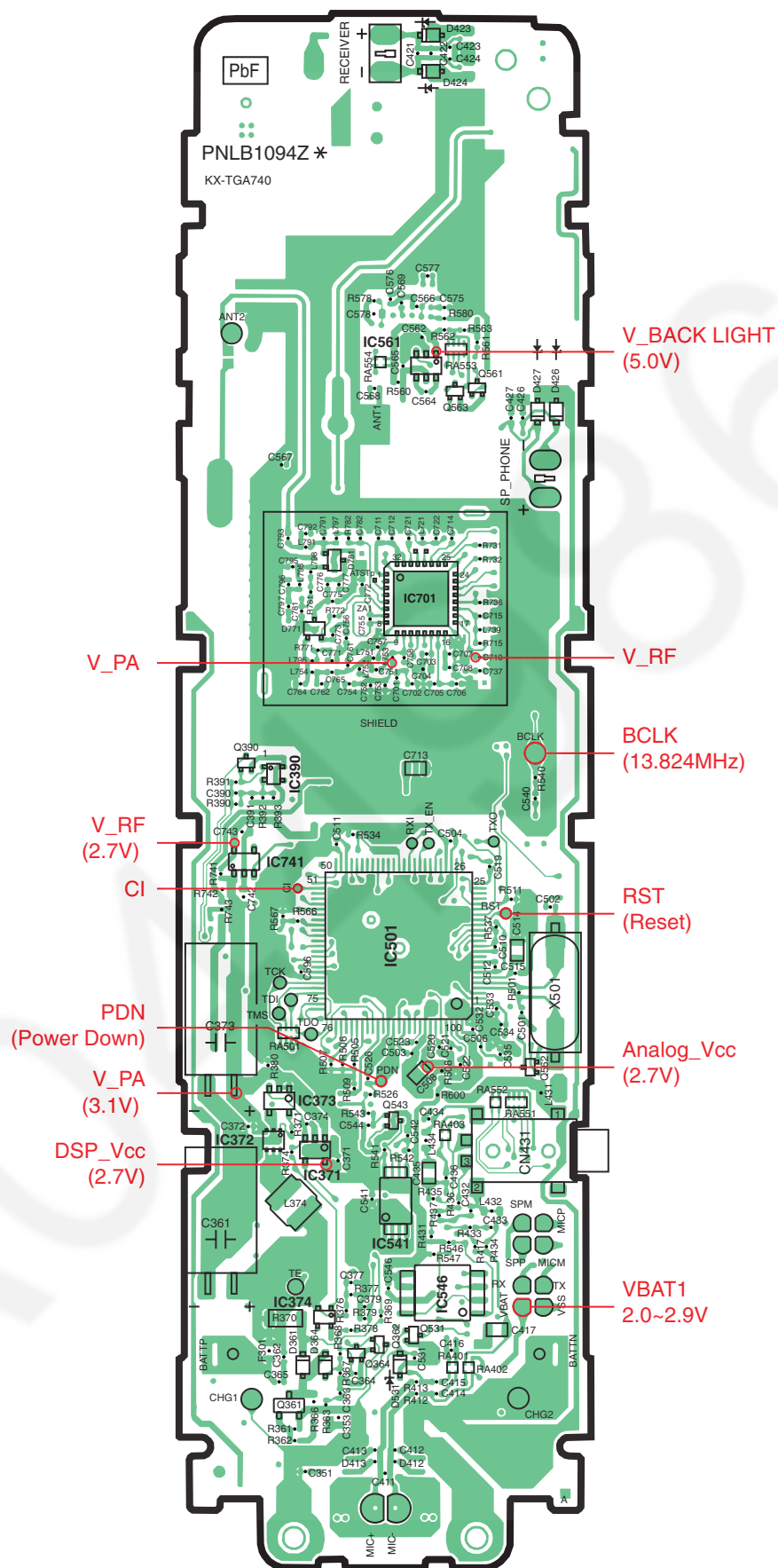
15.2. Circuit Board (Base Unit_RF Part)



KX-TG7411/7412 CIRCUIT BOARD (Base Unit_RF Part (Component View))

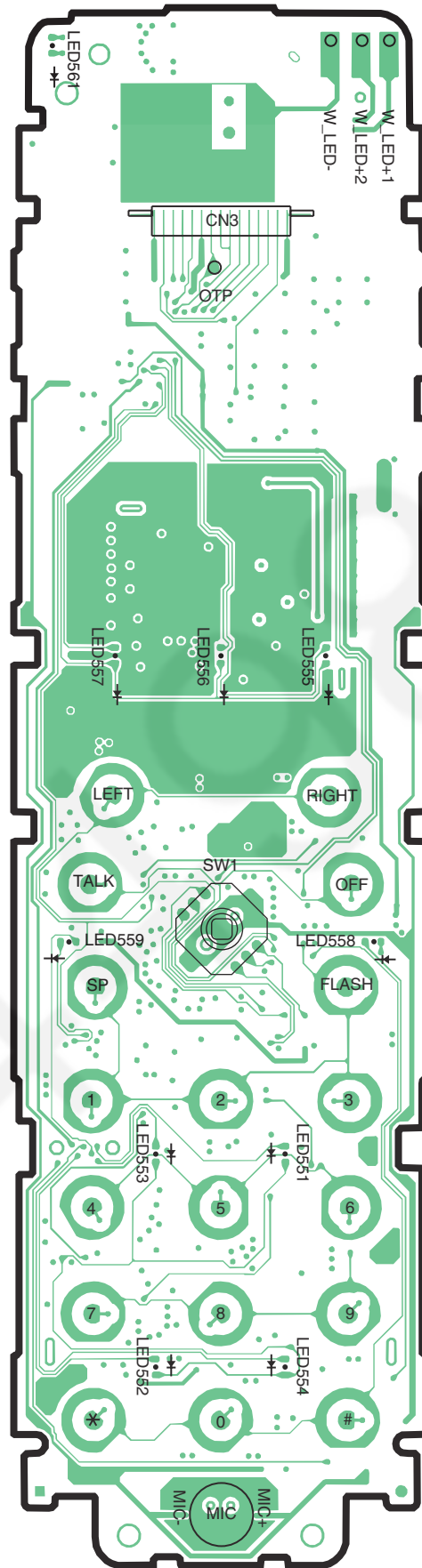
15.3. Circuit Board (Handset_Main)

15.3.1. Component View



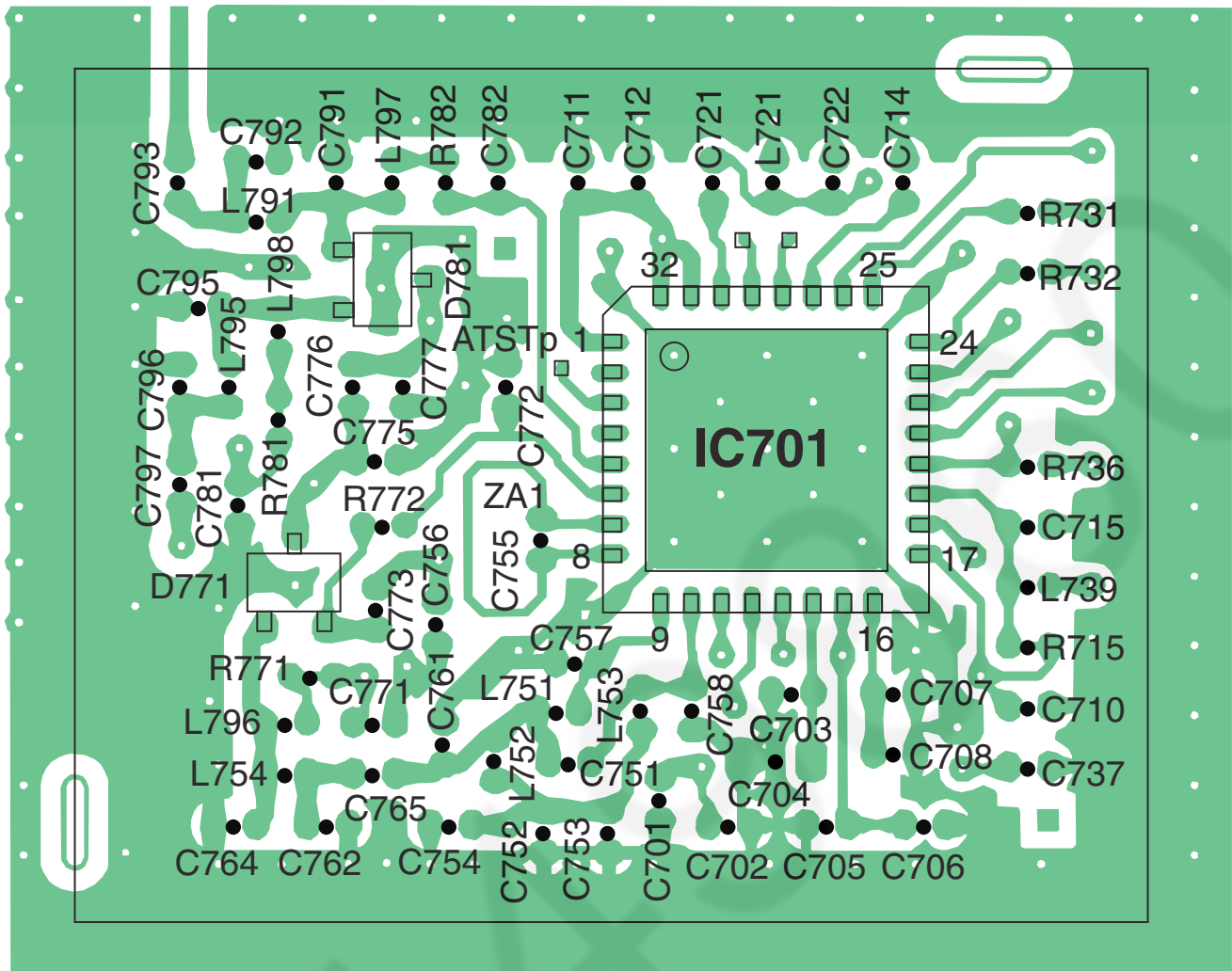
KX-TGA740 CIRCUIT BOARD (Handset_Main (Component View))

15.3.2. Bottom View



KX-TGA740 CIRCUIT BOARD (Handset_Main (Bottom View))

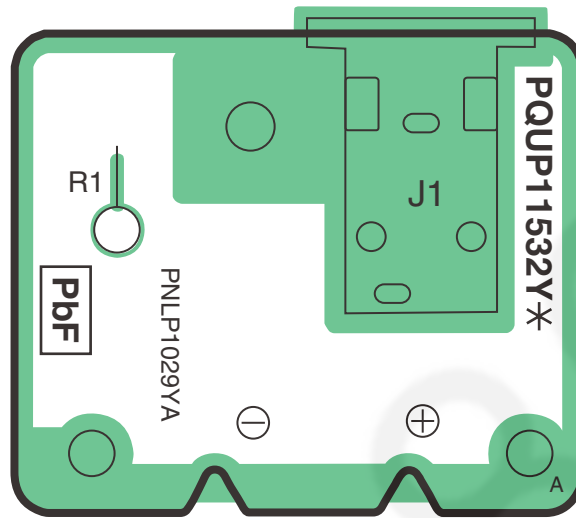
15.4. Circuit Board (Handset_RF Part)



KX-TGA740 CIRCUIT BOARD (Handset__RF Part (Component View))

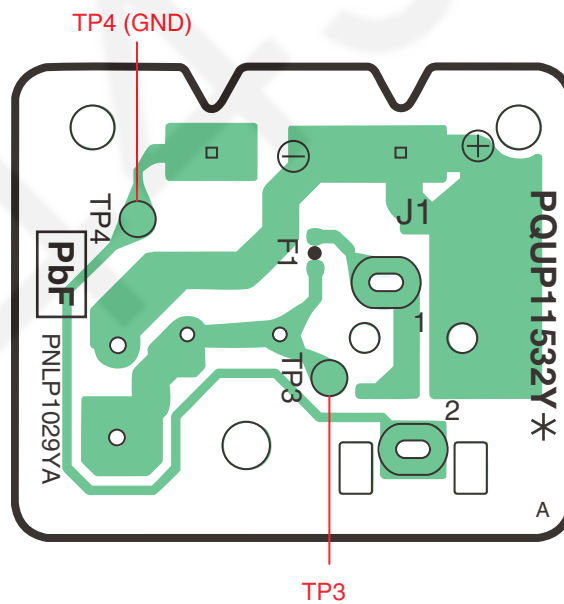
15.5. Circuit Board (Charger Unit)

15.5.1. Component View



CIRCUIT BOARD (Charger unit (Component View))

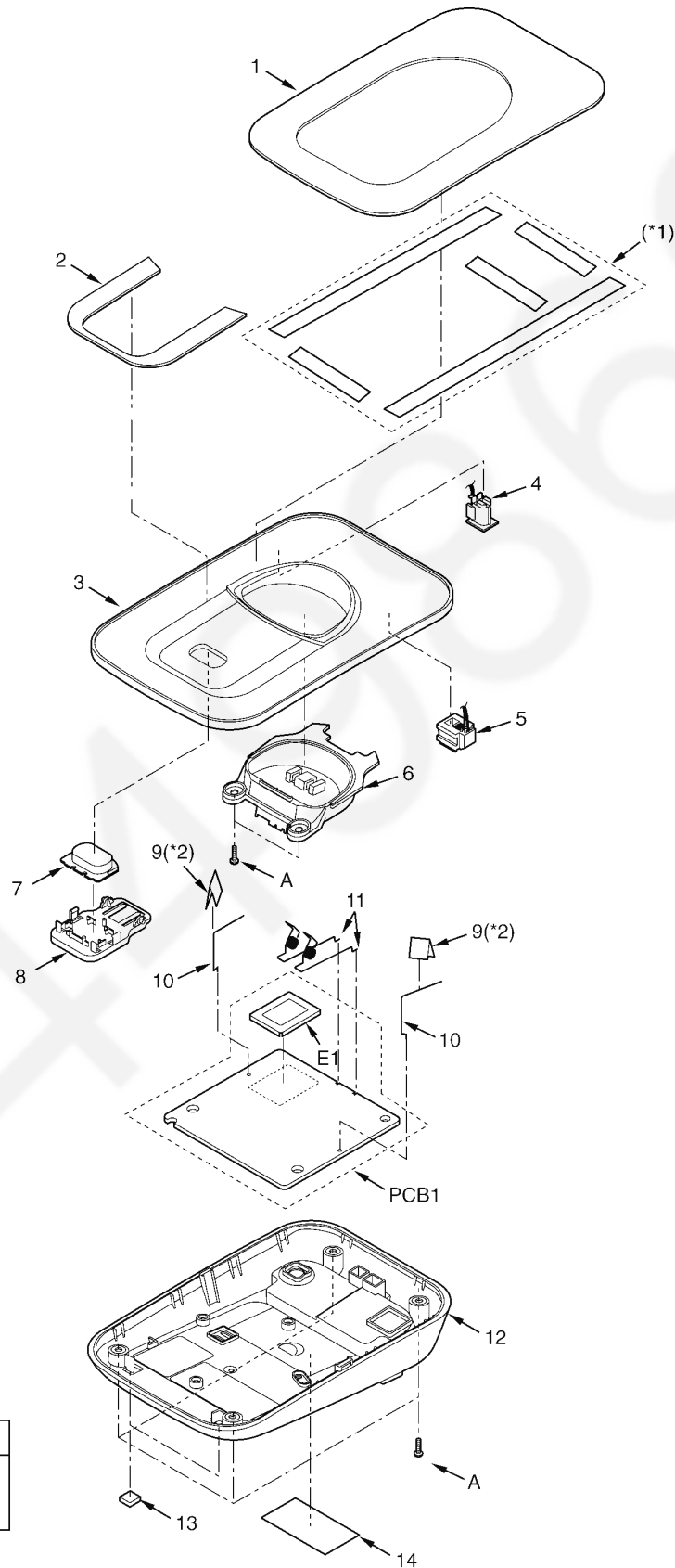
15.5.2. Bottom View



CIRCUIT BOARD (Charger unit (Bottom View))

16 Exploded View and Replacement Parts List

16.1. Cabinet and Electrical Parts (Base Unit)

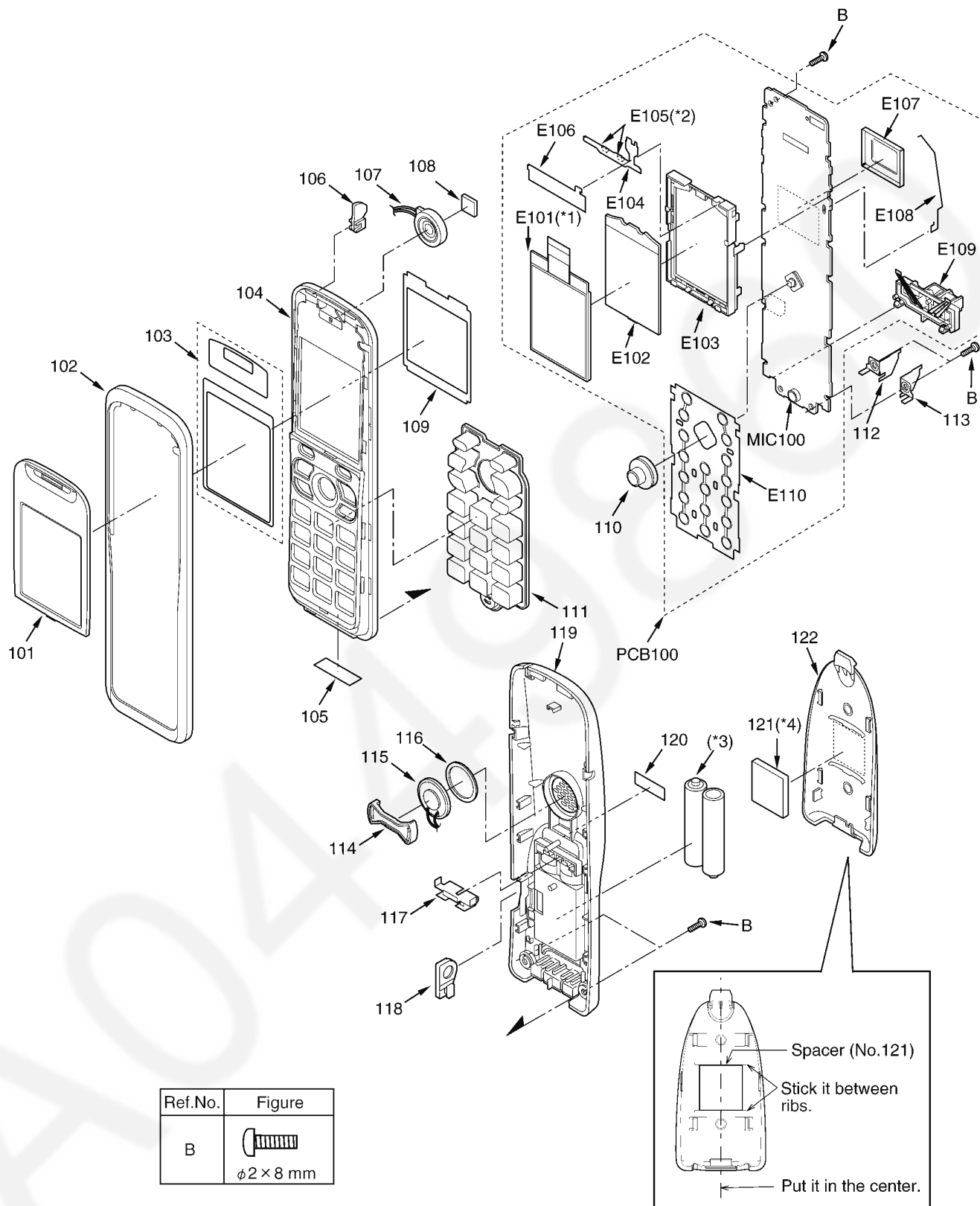


Note:

(*1) Attach the double side tape to the exact location described above.

(*2) Refer to the spacer (No. 109) of **Cabinet and Electrical Parts (Handset)** (P.93).

16.2. Cabinet and Electrical Parts (Handset)



Note:

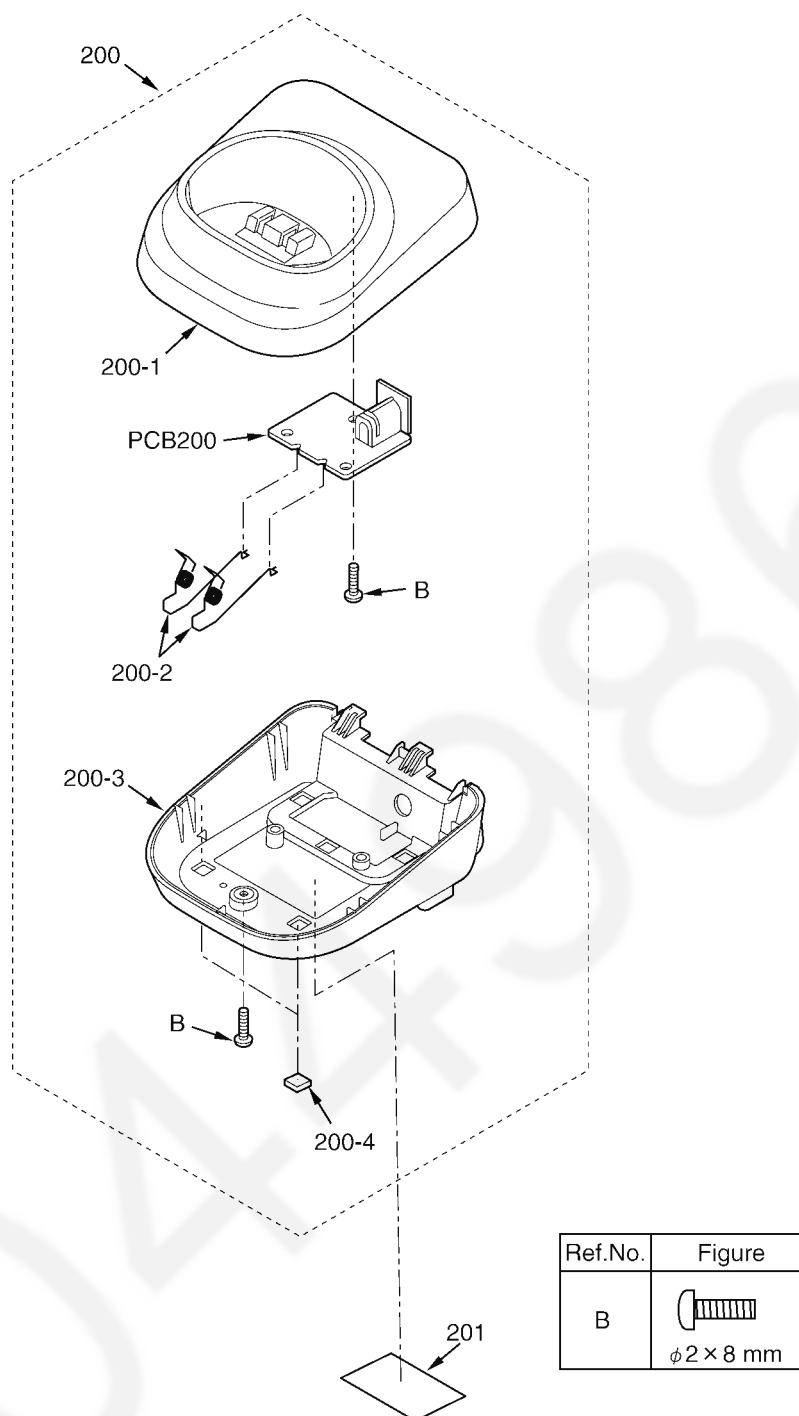
(*1) This cable is fixed by welding. Refer to **How to Replace the Handset LCD** (P.60).

(*2) Refer to **Handset** (P.74) of **Terminal Guide of the ICs, Transistors and Diodes**.

(*3) The rechargeable Ni-MH battery (HHR-4EPT or HHR-4MPT) is available through sales route of Panasonic.

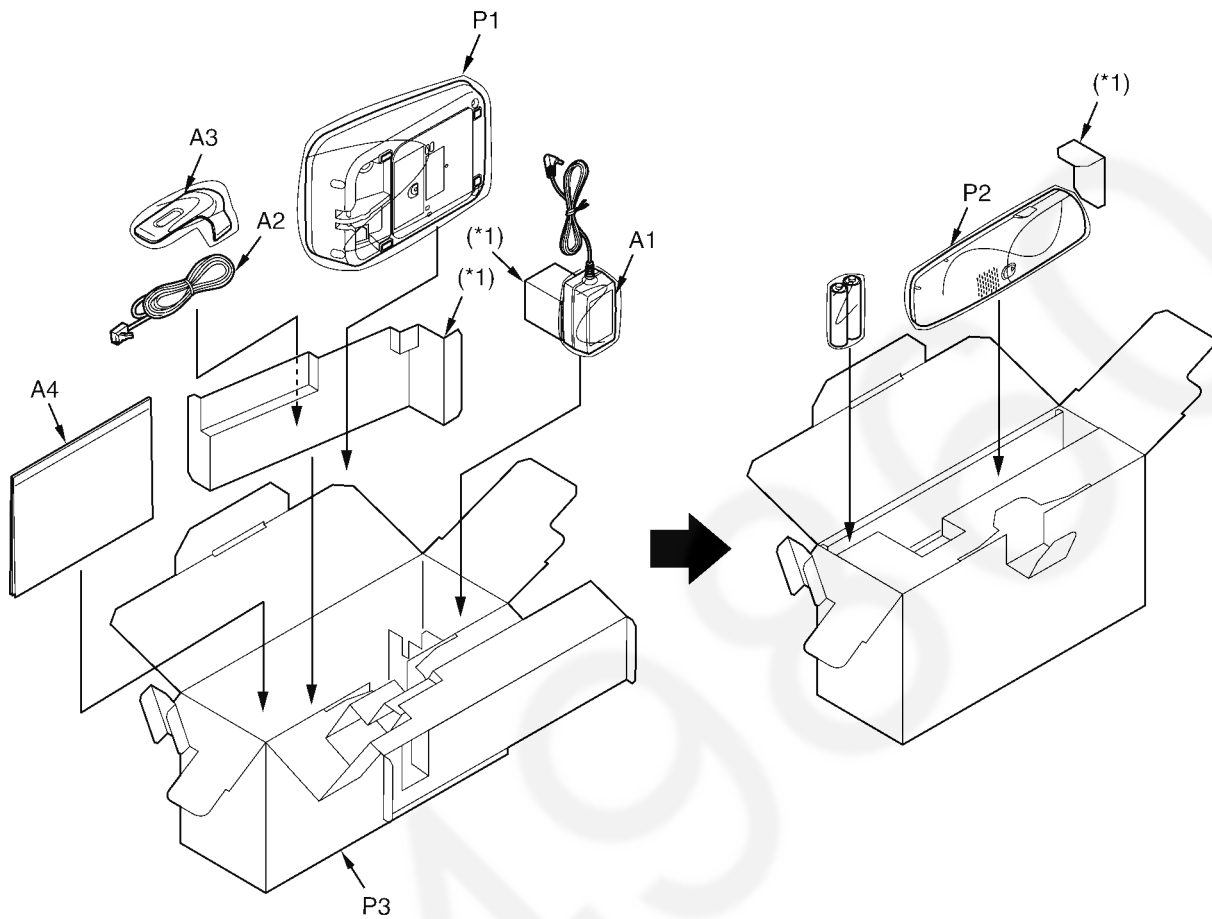
(*4) Attach the SPACER (No. 121) to the exact location described above.

16.3. Cabinet and Electrical Parts (Charger Unit)



16.4. Accessories and Packing Materials

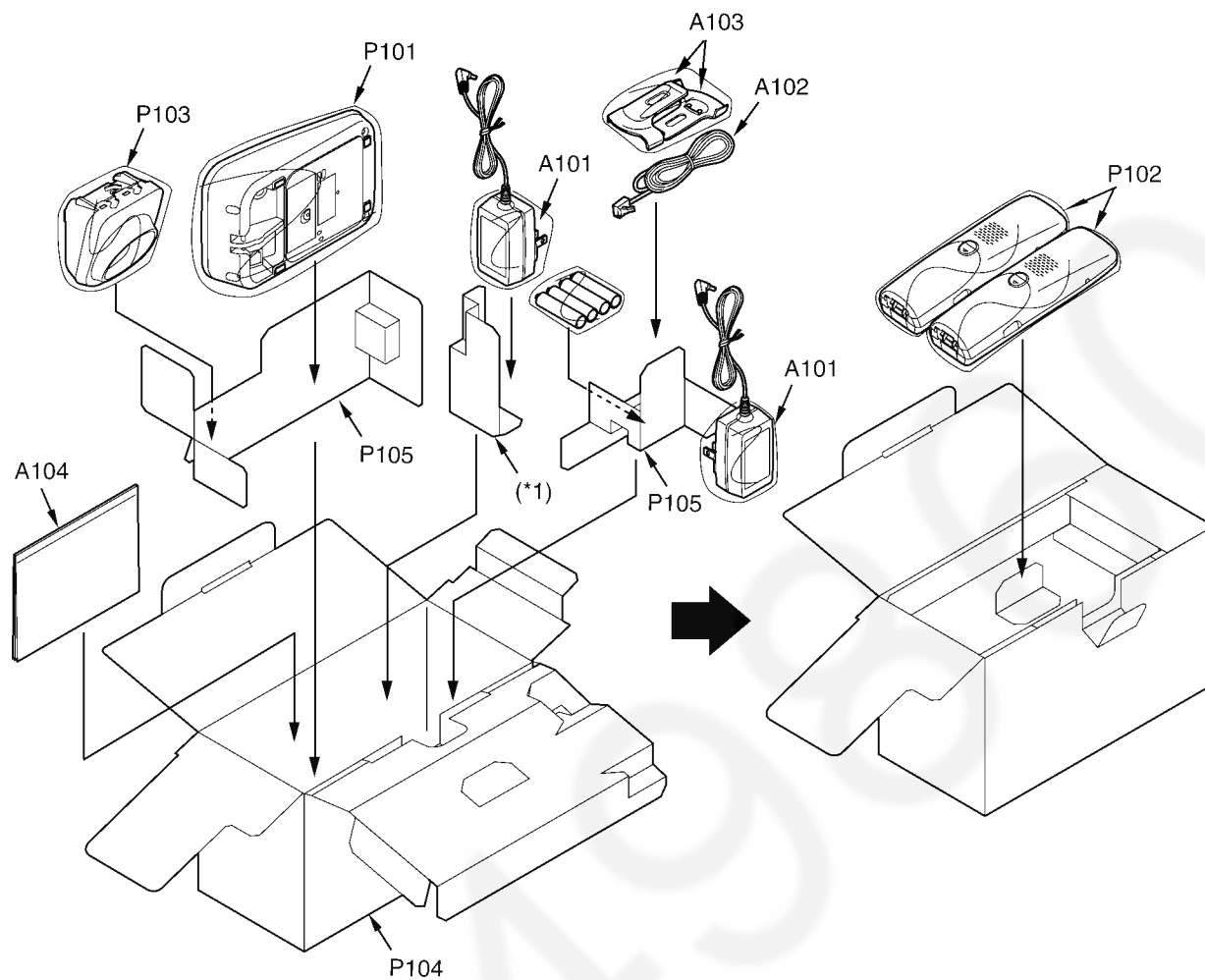
16.4.1. KX-TG7411MEB



Note:

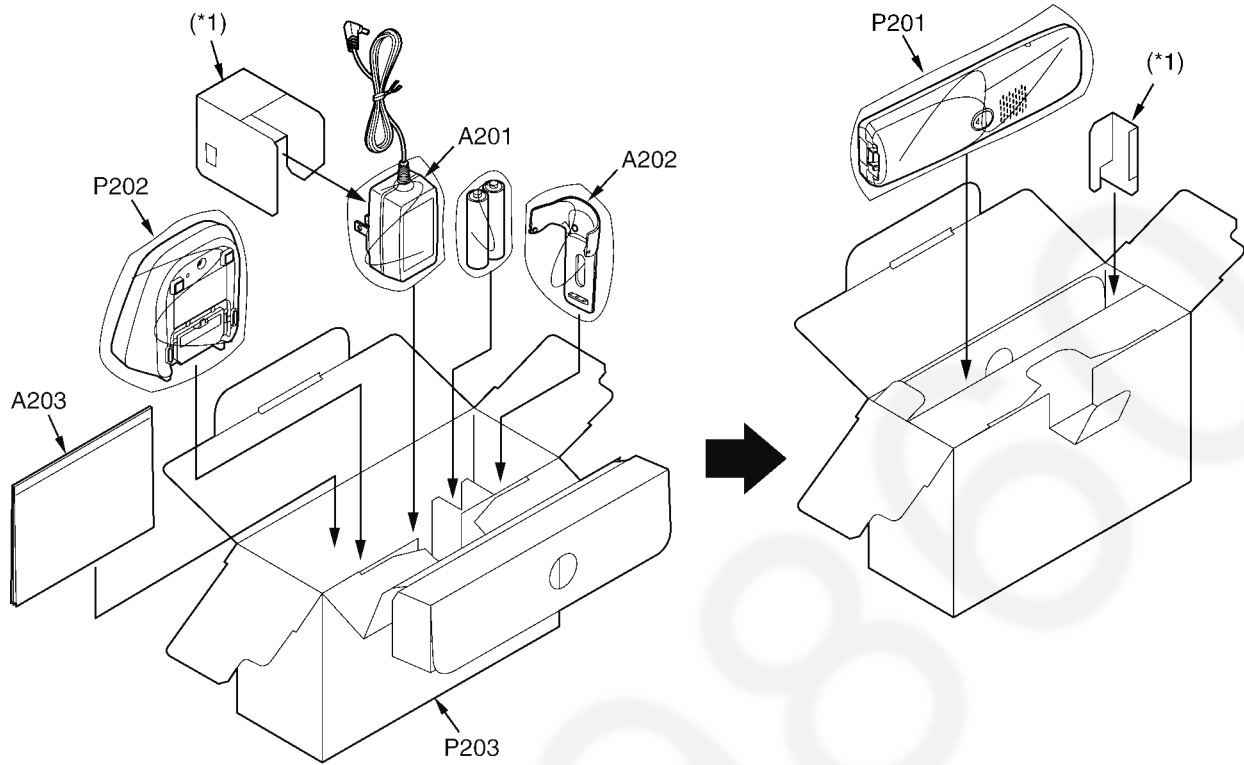
(*1) These pads are pieces of Ref No. P3 (GIFT BOX).

16.4.2. KX-TG7412MEB

**Note:**

(*1) This pad is a piece of Ref No. P104 (GIFT BOX).

16.4.3. KX-TGA740MEB



Note:

(*1) These pads are pieces of Ref No. P203 (GIFT BOX).

16.5. Replacement Parts List

1. RTL (Retention Time Limited)

Note:

The "RTL" marking indicates that its Retention Time is Limited.

When production is discontinued, this item will continue to be available only for a specific period of time.

This period of time depends on the type of item, and the local laws governing parts and product retention.

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

2. Important safety notice

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

3. The S mark means the part is one of some identical parts.

For that reason, it may be different from the installed part.

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

5. RESISTORS & CAPACITORS

Unless otherwise specified;

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

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

*Type & Wattage of Resistor

Type

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

Wattage

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

*Type & Voltage Of Capacitor

Type

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

Voltage

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

16.5.1. Base Unit

16.5.1.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	1	PNGP1051Y1	UPPER PANEL	ABS-HB
	2	PNGG1036Z1	GRILLE	ABS-HB
	3	PNKM1075Z1	CABINET BODY	ABS-HB
	4	K2ECY2000001	JACK, DC	
	5	PQJ1T039T	JACK, MODULAR	
	6	PNKE1028Z1	CASE, CHARGE TERMINAL	PS-HB
	7	PNBC1026Y1	BUTTON	AS-HB
	8	PNHR1117Z	GUIDE, BUTTON	ABS-HB
	9	PNYE1010Z	SPACER, ANTENNA	
	10	PNLA1002Z	ANTENNA	
	11	PNJT1024Z	CHARGE TERMINAL	
	12	PNKF1054Y1	CABINET COVER	PS-HB
	13	PQHA10023Z	RUBBER PARTS, FOOT	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	14	PNGT2424Z	NAME PLATE	

16.5.1.2. Main P.C. Board Parts

Note:

(*1) When you have replaced IC501, IC611 or X501, make adjustments. Refer to **Check and Adjust Frequency (Base Unit)** (P.62).

(*2) When replacing IC701, refer to **How to Replace the LLP (Leadless Leadframe Package) IC** (P.71).

(*3) When removing E1, use special tools (ex. Hot air disordering tool).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB1	PNWPG6411MEH	MAIN P.C.BOARD ASS'Y (RTL)	
			(ICs)	
	IC321	C0CBAYG00016	IC	S
	IC331	C0DBFGD00017	IC	
	IC501	C2HBBY000099	IC (DSP) (*1)	
	IC611	PNWIG6411MEH	IC (EEPROM) (*1)	
	IC701	C1CB00003088	IC (*2)	
			(TRANSISTORS)	
	Q111	2SC6054JSL	TRANSISTOR (SI)	
	Q141	B1ACGP000008	TRANSISTOR (SI)	
	Q142	PQVTFB822T7	TRANSISTOR (SI)	
	Q161	2SD0874AS	TRANSISTOR (SI)	
	Q171	2SC6054JSL	TRANSISTOR (SI)	
			(DIODES)	
	D101	PQVDM5S	DIODE (SI)	
	D113	MA111	DIODE (SI)	S
	D133	MA111	DIODE (SI)	S
	D143	MANV250GEL	DIODE (SI)	
	D153	MA111	DIODE (SI)	S
	D301	B0JCME000035	DIODE (SI)	
	D361	MA8220	DIODE (SI)	S
	D771	B0DDCD000001	DIODE (SI)	
	D781	B0DDCD000001	DIODE (SI)	
			(COILS)	
	L101	PQLQXF330K	COIL	S
	L102	PQLQXF330K	COIL	S
	L361	G1C6R8MA0072	COIL	
	L371	G1C6R8MA0072	COIL	
	L751	ELJRF4N7ZFB	COIL	S
	L752	MQLRF18NJFB	COIL	
	L753	ELJRF4N7ZFB	COIL	S
	L754	MQLRF5N6ZFB	COIL	
	L721	G1C1R0KA0096	COIL	
			(COMPONENTS PART)	
	RA501	D1H84724A013	RESISTOR ARRAY	S
			(VARISTOR)	
	SA102	PQVDDSS301L	VARISTOR (SURGE S ABSORBER)	
			(RESISTORS)	
	R111	PQ4R10XJ104	100k	S
	R112	PQ4R10XJ104	100k	S
	R113	ERJ3GEYJ103	10k	
	R114	ERJ3GEYJ473	47k	
	R115	ERJ12YJ273U	27k	
	R121	ERJ3GEYJ394	390k	
	R122	ERJ3GEYJ394	390k	
	R131	PQ4R18XJ106	10M	S
	R133	ERJ3GEYJ105	1M	
	R134	ERJ3GEYJ102	1k	
	R141	ERJ3GEYJ104	100k	
	R142	PQ4R18XJ272	2.7k	S
	R145	ERJ2GEJ222	2.2k	
	R151	ERJ3GEYJ106	10M	
	R152	ERJ3GEYJ335	3.3M	
	R154	ERJ3GEYJ102	1k	
	R160	ERJ3GEYJ820	82	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R161	ERJ3GEYJ104	100k	
	R162	ERJ3GEYJ333	33k	
	R163	ERJ12YJ120	12	
	R164	ERJ3GEYJ272	2.7k	
	R165	ERJ3GEYJ273	27k	
	R167	ERJ12YJ270	27	
	R168	ERJ3GEYJ821	820	
	R171	ERJ2GEJ220	22	
	R172	ERJ3GEYJ104	100k	
	R175	ERJ2GEJ561	560	
	R176	ERJ2GEJ101	100	
	R178	ERJ3GEYJ102	1k	
	R181	ERJ2GEJ391	390	
	R182	ERJ2GEJ560X	56	
	R321	ERJ2RKF1400	140	
	R322	ERJ2RKF1000	100	
	R362	ERJ3GEY0R00	0	
	R363	ERJ3GEY0R00	0	
	R371	ERJ12YJ100	10	
	R372	ERJ12YJ100	10	
	R373	ERJ12YJ100	10	
	R374	ERJ12YJ100	10	
	R421	ERJ3GEYJ473	47k	
	R422	ERJ2GEJ102	1k	
	R509	ERJ3GEYJ105	1M	
	R533	ERJ2GEJ472X	4.7k	
	R611	ERJ2GEJ222	2.2k	
	R612	ERJ2GEJ103	10k	
	R731	ERJ2GEJ101	100	
	R732	ERJ2GEJ101	100	
	R736	ERJ2GEJ391	390	
	R772	ERJ2GEJ561	560	
	L796	ERJ2GEJ561	560	
	L797	ERJ2GEJ561	560	
	L798	ERJ2GEJ561	560	
	L791	ERJ2GE0R00	0	
	L795	ERJ2GE0R00	0	
		(CAPACITORS)		
	C101	F1K2H681A008	680p	
	C102	F1K2H681A008	680p	
	C111	F1J2A473A024	0.047	
	C112	F1J2A473A024	0.047	
	C113	PQCUV1A684KB	0.68	
	C115	F1L2E2240004	0.22	
	C120	ECUE1H102KBQ	0.001	
	C121	F1K2H681A008	680p	
	C122	F1K2H681A008	680p	
	C132	ECUV1H103KBV	0.01	
	C142	ECUV1H103KBV	0.01	
	C151	ECUE1H100DCQ	10p	
	C152	ECUV1H103KBV	0.01	
	C161	ECEA1HKA100	10	
	C168	PQCUV1A225KB	2.2	
	C172	ECUE1H102KBQ	0.001	
	C173	ECUV1A224KBV	0.22	
	C176	PQCUV0J106KB	10	
	C178	ECUE1C223KBQ	0.022	
	C181	ECUE1A104KBQ	0.1	
	C184	ECUV1A105KBV	1	
	C185	ECUE1H100DCQ	10p	
	C186	ECUE1H100DCQ	10p	
	C306	F2A1C1010119	100	
	C321	ECUV1A105KBV	1	
	C322	PQCUV0J106KB	10	
	C331	ECUV1A474KBV	0.47	
	C341	ECEA0JSJ331	330	S
	C342	ECUV0J105KBV	1	
	C343	ECUV1A105KBV	1	
	C352	ECUE1H100DCQ	10p	
	C383	ECUE0J105KBQ	1	
	C422	ECUE1A104KBQ	0.1	
	C476	ECUE1H100DCQ	10p	
	C477	ECUE1H100DCQ	10p	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C478	ECUE1H100DCQ	10p	
	C501	ECUE1A104KBQ	0.1	
	C503	ECUE1A104KBQ	0.1	
	C504	ECUE1A104KBQ	0.1	
	C508	ECUE1H100DCQ	10p	
	C509	ECUE1H100DCQ	10p	
	C513	ECUE1A104KBQ	0.1	
	C514	PQCUV0J106KB	10	
	C515	ECUV0J105KBV	1	
	C516	PQCUV0J106KB	10	
	C517	ECUE1A104KBQ	0.1	
	C518	PQCUV0J106KB	10	
	C521	ECUE1A104KBQ	0.1	
	C531	ECUE1A104KBQ	0.1	
	C611	ECUE1A104KBQ	0.1	
	C612	ECUE1H101JCQ	100p	
	C701	ECUE1H100DCQ	10p	
	C702	ECUE1A104KBQ	0.1	
	C703	ECUE1H100DCQ	10p	
	C704	ECUV1A225KB	2.2	
	C705	ECUE1H100DCQ	10p	
	C706	ECUE1A104KBQ	0.1	
	C707	ECUE1H100DCQ	10p	
	C708	ECUE0J105KBQ	1	
	C710	ECUE1A104KBQ	0.1	
	C711	ECUE1H100DCQ	10p	
	C712	ECUE1A104KBQ	0.1	
	C714	ECUE0J105KBQ	1	
	C715	ECUE1A104KBQ	0.1	
	C721	ECUE1H101JCQ	100p	
	C722	ECUE1H121JCQ	120p	
	C737	ECUE1C103KBQ	0.01	
	C751	F1G1H1R3A561	1.3p	
	C752	ECUE1H100DCQ	10p	
	C753	F1G1H1R0A561	1p	
	C754	ECUE1A104KBQ	0.1	
	C755	F1G1H1R2A561	1.2p	
	C757	F1G1H1R3A561	1.3p	
	C762	F1G1HR50A561	0.5p	
	C764	F1G1H1R8A561	1.8p	
	C765	ECUE1H100DCQ	10p	
	C771	ECUE1H100DCQ	10p	
	C772	ECUE1H330JCQ	33p	
	C773	ECUE1H100DCQ	10p	
	C775	F1G1H1R8A561	1.8p	
	C776	F1G1H1R5A561	1.5p	
	C777	F1G1H1R8A561	1.8p	
	C781	ECUE1H100DCQ	10p	
	C782	ECUE1H100DCQ	10p	
	C793	ECUE1H100DCQ	10p	
	C796	F1G1HR50A561	0.5p	
	C797	ECUE1H100DCQ	10p	
		(OTHERS)		
	E1	PNMC1014Z	CASE, MAGNETIC SHIELD (*3)	
	P101	PFRT002	THERMISTOR (POSISTOR)	S
	SW662	K0H1BA000259	SPECIAL SWITCH	
	F301	K5H302Y00003	FUSE	
	X501	H0J138500011	CRYSTAL OSCILLATOR (*1)	

16.5.2. Handset

16.5.2.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	101	PNGP1049Z1	PANEL, LCD	AS-HB
	102	PNGG1034Z1	GRILLE	ABS-HB
	103	PNYE1012Z	TAPE, DOUBLE SIDED	
	104	PNKM1070Z1	CABINET BODY	ABS-HB
	105	PNGT2425Z	NAME PLATE	
	106	PNHR1105Z	OPTIC CONDUCTIVE PARTS, LED LENS	PS-HB

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	107	LOAD01A00018	RECEIVER	
	108	PQHG10729Z	RUBBERPARTS, RECEIVER	
	109	PNYE1010Z	SPACER, CUSHION LCD	
	110	PNBC1267Z1	BUTTON, CURSOL KEY	ABS-HB
	111	PNJK1049Y	KEYBOARD SWITCH	
	112	PNJT1027Y	CHARGE TERMINAL (L)	
	113	PNJT1026Y	CHARGE TERMINAL (R)	
	114	PQHR11315Z	GUIDE, SPEAKER	ABS-HB
	115	LOAA02A00095	SPEAKER	
	116	PQHS10784Y	SPACER, SPEAKER NET	
	117	PQJC10056X	BATTERY TERMINAL	
	118	PNKE1027Z1	COVER, EP CAP	
	119	PNKF1053Z1	CABINET COVER	ABS-HB
	120	PNQT1065Z	LABEL, ATTENTION	
	121	PNHS1079Z	SPACER, BATTERY	
	122	PNKK1027Z1	LID, BATTERY	ABS-HB

16.5.2.2. Main P.C. Board Parts

Note:

- (*1) When you have replaced IC501, IC541 or X501, make adjustments. Refer to **Check and Adjust Frequency (Handset)** (P.62) and **Adjust Battery Low Detector Voltage (Handset)** (P.62).
- (*2) When replacing IC701, refer to **How to Replace the LLP (Leadless Leadframe Package) IC** (P.71).
- (*3) When replacing the handset LCD, See **How to Replace the Handset LCD** (P.60).
- (*4) When removing E107, use special tools (ex. Hot air disordering tool).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB100	PNWPGA740MER	MAIN P.C.BOARD ASS'Y (RTL)	
			(ICs)	
	IC371	C0DBGYY00297	IC	
	IC373	C0DBAYY00067	IC	
	IC374	C0EBD0000355	IC	
	IC501	C2HBBY000103	IC (DSP) (*1)	
	IC541	PNWIGA740MER	IC (EEPROM) (*1)	
	IC561	C0DBAYY00146	IC	
	IC701	C1CB00003088	IC (*2)	
	IC741	C0CBCAC00252	IC	
			(TRANSISTORS)	
	Q361	B1ADGE000004	TRANSISTOR (SI)	
	Q362	2SC6054JSL	TRANSISTOR (SI)	
	Q364	2SC6054JSL	TRANSISTOR (SI)	
	Q531	UNR921EJ0L	TRANSISTOR (SI)	
	Q543	UNR9215J0L	TRANSISTOR (SI)	
	Q561	UNR921MJ0L	TRANSISTOR (SI)	
	Q562	UNR92AVJ0L	TRANSISTOR (SI)	
	IC372	MTM767200LBF	TRANSISTOR (SI)	
			(DIODES)	
	D361	MA2ZD0200L	DIODE (SI)	
	D364	MA8043L	DIODE (SI)	S
	D423	MA8043L	DIODE (SI)	S
	D424	MA8043L	DIODE (SI)	S
	D426	MA8043L	DIODE (SI)	S
	D427	MA8043L	DIODE (SI)	S
	D771	B0DDCD000001	DIODE (SI)	
	D781	B0DDCD000001	DIODE (SI)	
	LED551	B3ACB0000216	DIODE (SI)	
	LED552	B3ACB0000216	DIODE (SI)	
	LED553	B3ACB0000216	DIODE (SI)	
	LED554	B3ACB0000216	DIODE (SI)	
	LED558	B3ACB0000216	DIODE (SI)	
	LED559	B3ACB0000216	DIODE (SI)	
	LED561	B3ACB0000216	DIODE (SI)	
			(COILS)	
	L434	PQLQR2KB113T	COIL	S
	L721	G1C1R0KA0096	COIL	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	L374	G1C100MA0395	COIL	
	L751	ELJRF4N7ZFB	COIL	S
	L752	MLRFP18NJFB	COIL	
	L753	ELJRF4N7ZFB	COIL	S
	L754	MLRFP5N6ZFB	COIL	
	F301	PQLQR2M5N6K	COIL	S
			(VARISTORS)	
	D412	D4ED1180A013	VARISTOR	
	D413	D4ED1180A013	VARISTOR	
			(COMPONENTS PARTS)	
	RA401	D1H447120002	RESISTOR ARRAY	
	RA402	D1H447220001	RESISTOR ARRAY	
	RA403	D1H410120001	RESISTOR ARRAY	
	RA501	D1H84724A013	RESISTOR ARRAY	
	RA551	D1H84714A013	RESISTOR ARRAY	
	RA552	D1H447120002	RESISTOR ARRAY	
	RA554	D1H412120001	RESISTOR ARRAY	
			(RESISTORS)	
	R361	ERJ2GEJ473	47k	
	R362	ERJ2GEJ561	560	
	R363	ERJ2GEJ473	47k	
	R366	ERJ3GEYJ332	3.3k	
	R367	ERJ2GEJ121	120	
	R368	ERJ2GEJ103	10k	
	R369	ERJ2GEJ333	33k	
	R370	ERJ8GEYJ1R2	1.2	
	R371	ERJ2GEJ470	47	
	R374	ERJ2GEJ224	220k	
	R376	ERJ2GEJ105X	1M	
	R377	ERJ2GEJ225	2.2M	
	R378	ERJ2GEJ105X	1M	
	R379	ERJ2GEJ225	2.2M	
	R412	ERJ2GEJ101	100	
	R413	ERJ2GEJ101	100	
	R417	ERJ2GEJ391	390	
	R433	ERJ2GEJ102	1k	
	R434	ERJ2GEJ222	2.2k	
	R436	ERJ2GEJ102	1k	
	R437	ERJ2GEJ104	100k	
	R501	ERJ2GEJ105X	1M	
	R508	ERJ3GEYJ100	10	
	R509	ERJ2GEJ104	100k	
	R526	ERJ2GEJ473	47k	
	R534	ERJ2GEJ103	10k	
	R541	ERJ2GEJ103	10k	
	R542	ERJ2GEJ222	2.2k	
	R543	ERJ2GEJ274	270k	
	R561	ERJ2GEJ101	100	
	R563	ERJ2GE0R00	0	
	R567	ERJ2GE0R00	0	
	R600	ERJ3GEY0R00	0	
	R731	ERJ2GEJ101	100	
	R732	ERJ2GEJ101	100	
	R736	ERJ2GEJ391	390	
	R742	ERJ3GEY0R00	0	
	R772	ERJ2GEJ561	560	
	L791	ERJ2GE0R00	0	
	L795	ERJ2GE0R00	0	
	L796	ERJ2GEJ561	560	
	L797	ERJ2GEJ561	560	
	L798	ERJ2GEJ561	560	
			(CAPACITORS)	
	C361	F2A0J6810012	680	
	C362	ECUE1A104KBQ	0.1	
	C363	ECUE1A104KBQ	0.1	
	C371	ECUE0J105KBQ	1	
	C372	ECUE0J105KBQ	1	
	C373	F2A0J3310068	330	
	C374	ECUE1A104KBQ	0.1	
	C377	ECUE1A104KBQ	0.1	
	C379	ECUE1A104KBQ	0.1	
	C414	ECUE1C223KBQ	0.022	
	C415	ECUE1C223KBQ	0.022	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C416	ECUE1H102KBQ	0.001	
	C417	PQCUV0J106KB	10	
	C421	ECUE0J105KBQ	1	
	C422	ECUE0J105KBQ	1	
	C433	ECUE1E682KBQ	0.0068	
	C435	PQCUV0J106KB	10	
	C501	ECUE1H100DCQ	10p	
	C502	ECUE1H120JCQ	12p	
	C503	ECUE0J105KBQ	1	
	C504	ECUE1A104KBQ	0.1	
	C506	ECUV1C104KBV	0.1	
	C508	PQCUV0J106KB	10	
	C510	ECUE0J105KBQ	1	
	C512	ECUE1C103KBQ	0.01	
	C514	PQCUV0J106KB	10	
	C515	ECUE1A104KBQ	0.1	
	C520	ECUE1H100DCQ	10p	
	C521	ECUE1H100DCQ	10p	
	C522	ECUE1H100DCQ	10p	
	C523	ECUE1H100DCQ	10p	
	C526	ECUE1A104KBQ	0.1	
	C531	ECUE1A104KBQ	0.1	
	C532	ECUE1H100DCQ	10p	
	C533	ECUE1H100DCQ	10p	
	C534	ECUE1H102KBQ	0.001	
	C535	ECUE1H102KBQ	0.001	
	C540	ECUE1A104KBQ	0.1	
	C541	ECUE1A104KBQ	0.1	
	C542	ECUE1H101JCQ	100p	
	C544	ECUE1A104KBQ	0.1	
	C562	ECUV1A105KBV	1	
	C564	ECUE1A104KBQ	0.1	
	C565	ECUE0J105KBQ	1	
	C567	ECUE1H100DCQ	10p	
	C575	ECUE0J105KBQ	1	
	C576	ECUE0J105KBQ	1	
	C577	ECUE0J105KBQ	1	
	C578	ECUV1C105KBV	1	
	C596	ECUE1A104KBQ	0.1	
	C701	ECUE1H100DCQ	10p	
	C702	ECUE1A104KBQ	0.1	
	C703	ECUE1H100DCQ	10p	
	C704	ECUV1A225KB	2.2	
	C705	ECUE1H100DCQ	10p	
	C706	ECUE1A104KBQ	0.1	
	C707	ECUE1H100DCQ	10p	
	C708	ECUE0J105KBQ	1	
	C710	ECUE1A104KBQ	0.1	
	C711	ECUE1H100DCQ	10p	
	C712	ECUE1A104KBQ	0.1	
	C713	PQCUV0J106KB	10	
	C714	ECUE0J105KBQ	1	
	C715	ECUE1A104KBQ	0.1	
	C721	ECUE1H101JCQ	100p	
	C722	ECUE1H121JCQ	120p	
	C737	ECUE1C103KBQ	0.01	
	C742	ECUV1A474KBV	0.47	
	C743	ECUV1A105KBV	1	
	C751	F1G1H1R3A561	1.3p	
	C752	ECUE1H100DCQ	10p	
	C753	F1G1H1R0A561	1p	
	C754	ECUE1A104KBQ	0.1	
	C755	F1G1H1R2A561	1.2p	
	C757	F1G1H1R3A561	1.3p	
	C762	F1G1HR50A561	0.5p	
	C764	F1G1H1R8A561	1.8p	
	C765	ECUE1H100DCQ	10p	
	C771	ECUE1H100DCQ	10p	
	C772	ECUE1H330JCQ	33p	
	C773	ECUE1H100DCQ	10p	
	C775	F1G1H1R8A561	1.8p	
	C776	F1G1H1R5A561	1.5p	
	C777	F1G1H1R8A561	1.8	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C781	ECUE1H100DCQ	10p	
	C782	ECUE1H100DCQ	10p	
	C792	F1G1HR50A561	0.5p	
	C793	ECUE1H100DCQ	10p	
	C797	ECUE1H100DCQ	10p	
			(OTHERS)	
	MIC100	L0CBAY000032	MICROPHONE	
	E101	L5DYBYY00002	LIQUID CRYSTAL DISPLAY (*3)	
	E102	PNHR1109Z	TRANSPARENT PLATE, LCD PLATE	PMMA-HB
	E103	PNHR1108Z	GUIDE, LCD	ABS-HB
	E104	PNJE1020Z	LEAD WIRE, FPC	
	E105	B3AFB0000211	LED	
	E106	PNHX1134Z	COVER, LCD	
	E107	PNMC1014Z	CASE, MAGNETIC SHIELD (*4)	
	E108	PNLA1018Z	ANTENNA	
	E109	PNVE1002Z	BATTERY TERMINAL	
	E110	PNJE1021Z	SHEET SWITCH	
	CN431	K2HD103D0001	JACK	
	X501	H0J138500003	CRYSTAL OSCILLATOR (*1)	
	SW1	K0C115A00007	SEESAW SWITCH	

16.5.3. Charger Unit

16.5.3.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	200	PNLC1007ZB	CHARGER UNIT ASS'Y without NAME PLATE (RTL)	
	200-1	PNKM1076Z1	CABINET BODY	ABS-HB
	200-2	PNJT1010Z	CHARGE TERMINAL	
	200-3	PNKF1012Z1	CABINET COVER	PS-HB
	200-4	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	
	201	PNGT2427Z	NAME PLATE	

16.5.3.2. Main P.C. Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB200	PNWPTGA641CH	MAIN P.C. BOARD ASS'Y (RTL)	
			(JACK)	
	J1	K2ECYB000001	JACK	
			(RESISTOR)	
	R1	ERG2S120	12	
			(FUSE)	
	F1	K5H302Y00003	FUSE	

16.5.4. Accessories and Packing Materials

Note:

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

16.5.4.1. KX-TG7411MEB

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
△	A1	PQLV219Z	AC ADAPTOR	
	A2	PQJA10075Z	CORD, TELEPHONE	
	A3	PNKE1029Z1	HANGER, BELT CLIP	ABS-HB
	A4	PNQX1647Z	INSTRUCTION BOOK (*1)	
	P1	PQPH10089Z	PROTECTION COVER (for Base Unit)	
	P2	PQPH10088Z	PROTECTION COVER (for Handset)	
	P3	PNPK2456Z	GIFT BOX	

16.5.4.2. KX-TG7412MEB

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	A101	PQLV219Z	AC ADAPTOR	
	A102	PQJA10075Z	CORD, TELEPHONE	
	A103	PNKE1029Z1	HANGER, BELT CLIP	ABS-HB
	A104	PNQX1647Z	INSTRUCTIONBOOK (*1)	
	P101	PQPH10089Z	PROTECTION COVER (for Base Unit)	
	P102	PQPH10088Z	PROTECTION COVER (for Handset)	
	P103	PNPM1003Z	PROTECTION COVER (for Charger Unit)	
	P104	PNPK2458Z	GIFT BOX	
	P105	PNPD1166Z	CUSHION	

16.5.4.3. KX-TGA740MEB

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	A201	PQLV219Z	AC ADAPTOR	
	A202	PNKE1029Z1	HANGER, BELT CLIP	ABS-HB
	A203	PNQX1655Z	INSTRUCTIONBOOK (*1)	
	P201	PQPH10088Z	PROTECTION COVER (for Handset)	
	P202	PNPM1003Z	PROTECTION COVER (for Charger Unit)	
	P203	PNPK2428Z	GIFT BOX	

16.5.5. Screws

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

16.5.6. Fixtures and Tools**Note:**

When replacing the Handset LCD, See **How to Replace the Handset LCD** (P.60).

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