

Service Manual

Telephone Equipment

Model No. **KX-TG3611BXB**

KX-TG3611BXS

KX-TG3612BXB

KX-TG3612BXS

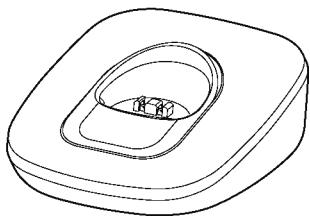
KX-TGA361BXB

KX-TGA361BXS

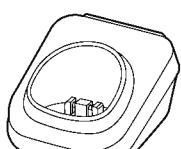
Caller ID Compatible



KX-TGA361BXB/BXS
(Handset)



KX-TG3611/3612BXB/BXS
(Base Unit)



(Charger Unit)

2.4 GHz Digital Cordless Phone

B: Black Version

S: Pearl White Version

(for Asia, Middle Near East and other areas)

Configuration for each model

Model No	Base Unit	Handset	Charger Unit
KX-TG3611	1 (TG3611)	1 (TGA361)	
KX-TG3612	1 (TG3612)	2 (TGA361)	1

Panasonic

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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:

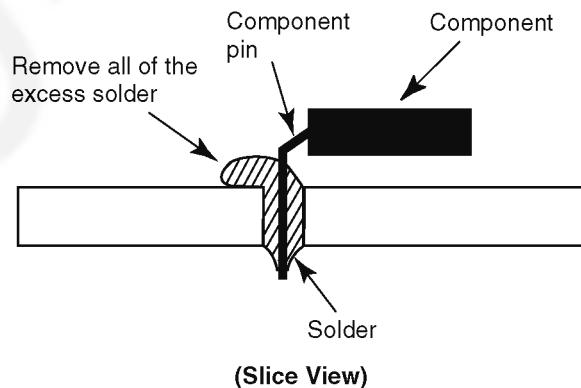
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

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

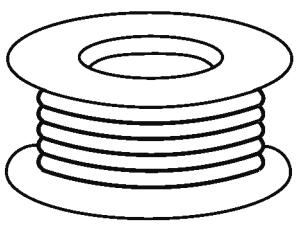
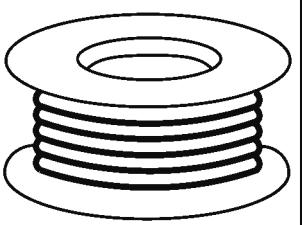
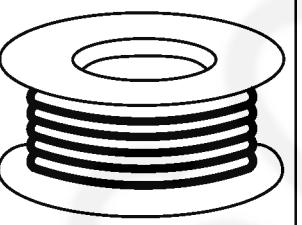
- PbF solder has a melting point that is 50°F ~ 70°F (30°C ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700°F ± 20°F (370°C ± 10°C).
- Exercise care while using higher temperature soldering irons.: Do not heat the PCB for too long time in order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

	Base Unit	Handset	Charger
Power Supply	AC Adaptor (PQLV219BXZ, 220-240 V AC, 50/60 Hz)	Rechargeable Ni-MH battery (2 x 1.2 V, 630 mAh)	AC Adaptor (PQLV219BXZ, 220-240 V AC, 50/60 Hz)
Receiving/Transmitting Frequency	90 channels within 2.4 GHz - 2.48 GHz	90 channels within 2.4 GHz - 2.48 GHz	—
Receiving Method	Super Heterodyne	Super Heterodyne	—
Oscillation Method	PLL synthesizer	PLL synthesizer	—
Detecting Method	Quadrature Discriminator	Quadrature Discriminator	—
Tolerance of OSC Frequency	13.824 MHz ±100 Hz	13.824 MHz ±100 Hz	—
Modulation Method	Frequency Modulation	Frequency Modulation	—
Spread spectrum Method	Frequency Hopping Spread spectrum	Frequency Hopping Spread spectrum	—
ID Code	19 bit	22 bit	—
Security Codes	—	1,000,000	—
Ringer Equivalence No. (REN)	0.1	—	—
Dialing Mode	—	Tone (DTMF)/Pulse	—
Redial	—	Up to 48 digits	—
Speed Dialer	—	Up to 32 digits (Phonebook)	—
Power Consumption	Standby: Approx. 1.2 W. Maximum: Approx. 3.4 W	11 days at Standby, 5 hours at Talk	Standby: Approx. 0.1 W, Maximum: Approx. 2.4 W
Operating Environment	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. 59 mm x 122 mm x 118 mm	Approx. 155 mm x 48 mm x 32 mm	Approx. 51 mm x 75 mm x 88 mm
Mass (Weight)	Approx. 139 g	Approx. 126 g	Approx. 60 g

Note:

- Design and specifications are subject to change without notice.

4 Technical Descriptions

4.1. FHSS Description

4.1.1. Frequency

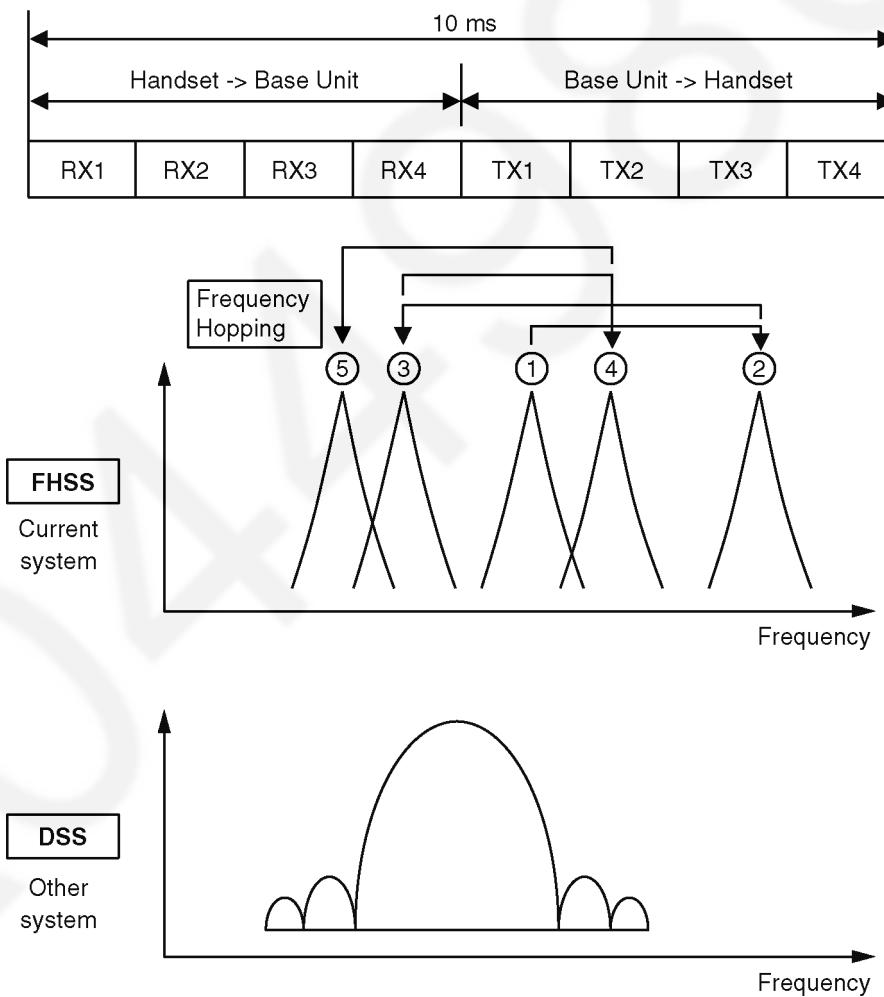
The frequency range of 2.4 GHz-2.48 GHz is used. Transmitting and receiving channel between base unit and handset is same frequency. Refer to **Frequency Table** (P.75).

4.1.2. FHSS (Frequency Hopping Spread Spectrum)

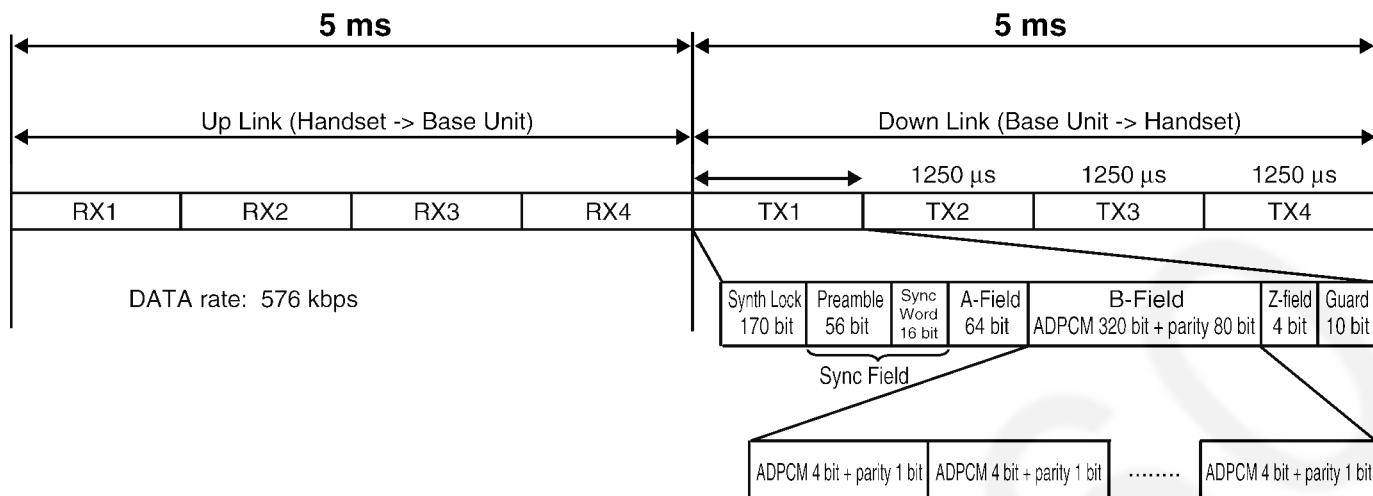
This telephone is using an IC chip which has similar specification to WDCT (World Digital Cordless Telephone) and is the telephone system that can use multiple portable unit simultaneously. The explanation of this system is mentioned below. This system uses a Time Division Multiple Access/Time Division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

transmitting and receiving frequencies of the base unit and handset are shared in the same frequency. The construction of RX/TX frequency data is shown below. It consists of 4 slots from the base unit to the handset, and 4 slots from the handset to the base unit, total 8 slots in 10 ms. By this slot system, simultaneous air link and communication between 4 handsets and the base unit can be realized. One communication between handset and the base unit is done by one slot from the base unit to handset, and another slot from handset to the base unit.

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



4.1.2.1. TDD Frame Format



4.1.2.2. TDMA system

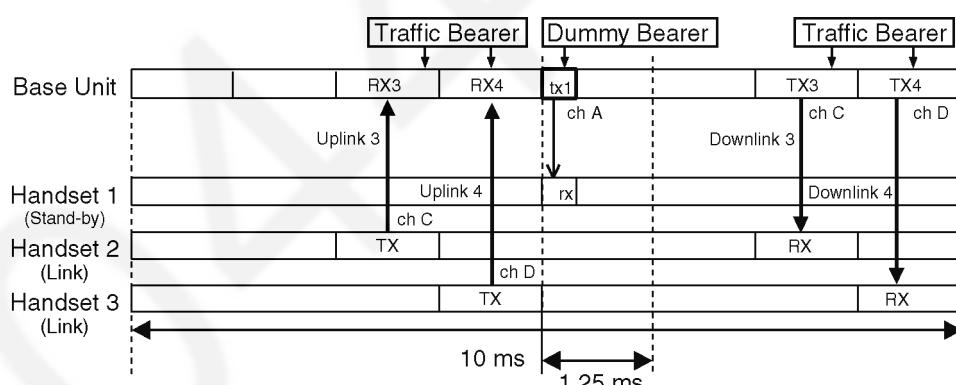
This system is the cycles of 10 ms, and has four duplex paths, so it is possible to perform four duplex communications simultaneously.

In 1 slot 1.25 ms, the 10 ms of voice data is transmitted.

Each slot makes every frame frequency hop. (100 hops/sec.)

Although each slot (UpLink3 and UpLink4) uses different frequency, UpLink3 and DownLink3 use the same frequency.

• 2 - Handsets Link



Traffic Bearer

A link is established between base unit and handset.

The state where duplex communication is performed.

The hopping pattern of a 1800 hops (18 seconds) cycle.

Dummy Bearer

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

The handsets receive that data for keeping synchronization and monitoring request from the base unit.

Dummy Bearer doesn't contain B-field (sound) data.

4.1.3. Signal Flowchart in the Whole System

Reception

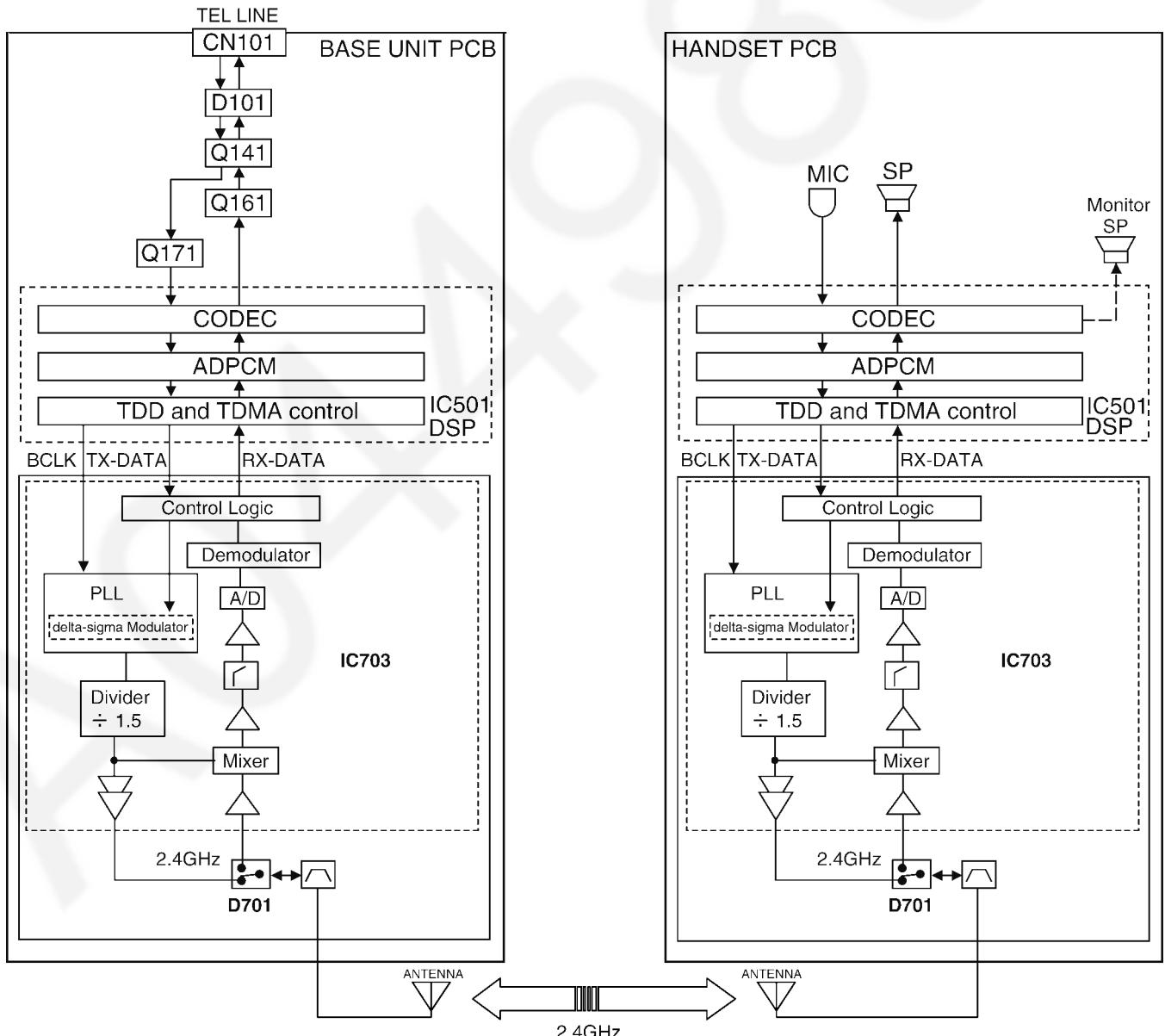
CN101 of the base unit is connected to the TEL line, and signal is entered through the bridge diode D101. While talking, the relay (Q141) is turned ON and amplified at the Q171, then led to DSP (IC501). The DSP encodes ADPCM and TDD/TDMA with FHSS to TX-DATA. The TX-DATA signal is entered to IC703 of RF UNIT, and modulated to 2.4 GHz. The RF signal is fed into Tx/Rx switch (D701). The RF signal is fed to Antenna.

As for the handset, RF signal from the antenna is routed by Tx/Rx switch (D701) and led to IC703. The RF signal is amplified by LNA and down-converted to IF signal in IC703. The IF signal passing through internal filter is demodulated into RX-DATA. then enters DSP (IC501). The DSP performs TDD/TDMA and ADPCM decoding to convert the RX-DATA into the voice signal, then it is output to the speaker.

Transmission

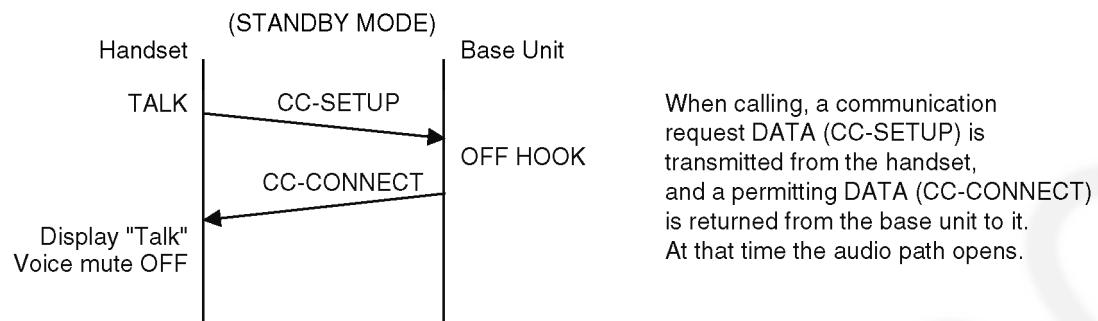
The voice signal entering from the microphone is led to DSP (IC501). The DSP encodes ADPCM and TDD/TDMA with FHSS to TX-DATA. The TX-DATA signal enters IC703 of RF UNIT, and is modulated to 2.4 GHz. The RF signal is fed into Tx/Rx switch (D701). The RF signal is fed to Antenna.

As for the base unit. RF signal from the Antenna is routed by Tx/Rx switch (D701) and led to IC703. The RF signal is amplified by LNA and down-converted to IF signal in IC703. The IF signal passing through internal filter is demodulated, then enters DSP (IC501). The DSP performs TDD/TDMA and ADPCM decoding to convert the RX-DATA into the voice signal. The voice signal is amplified at the TX amplifier (Q161). then output to the TEL line CN101 through the relay (Q141) and bridge (D101).

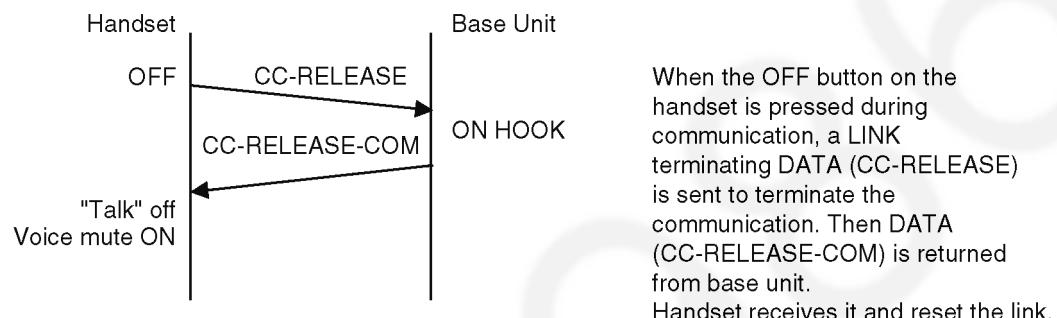


4.2. Explanation of Link Data Communication

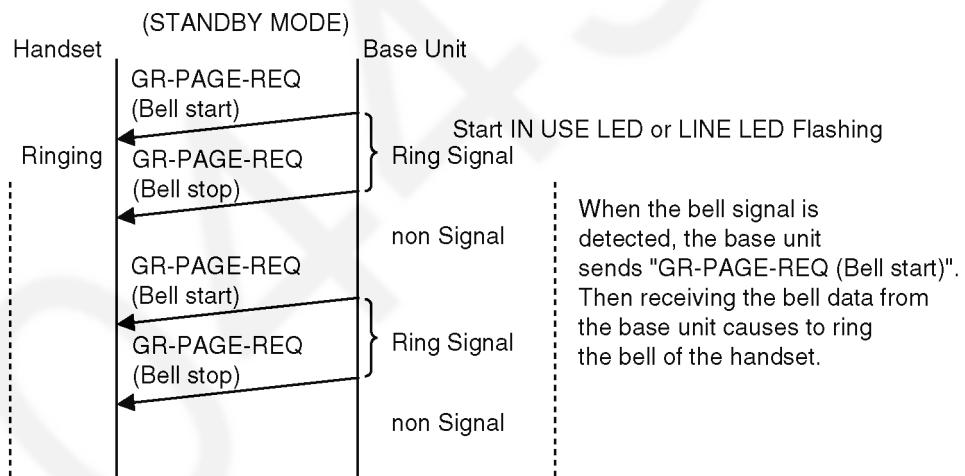
4.2.1. Calling



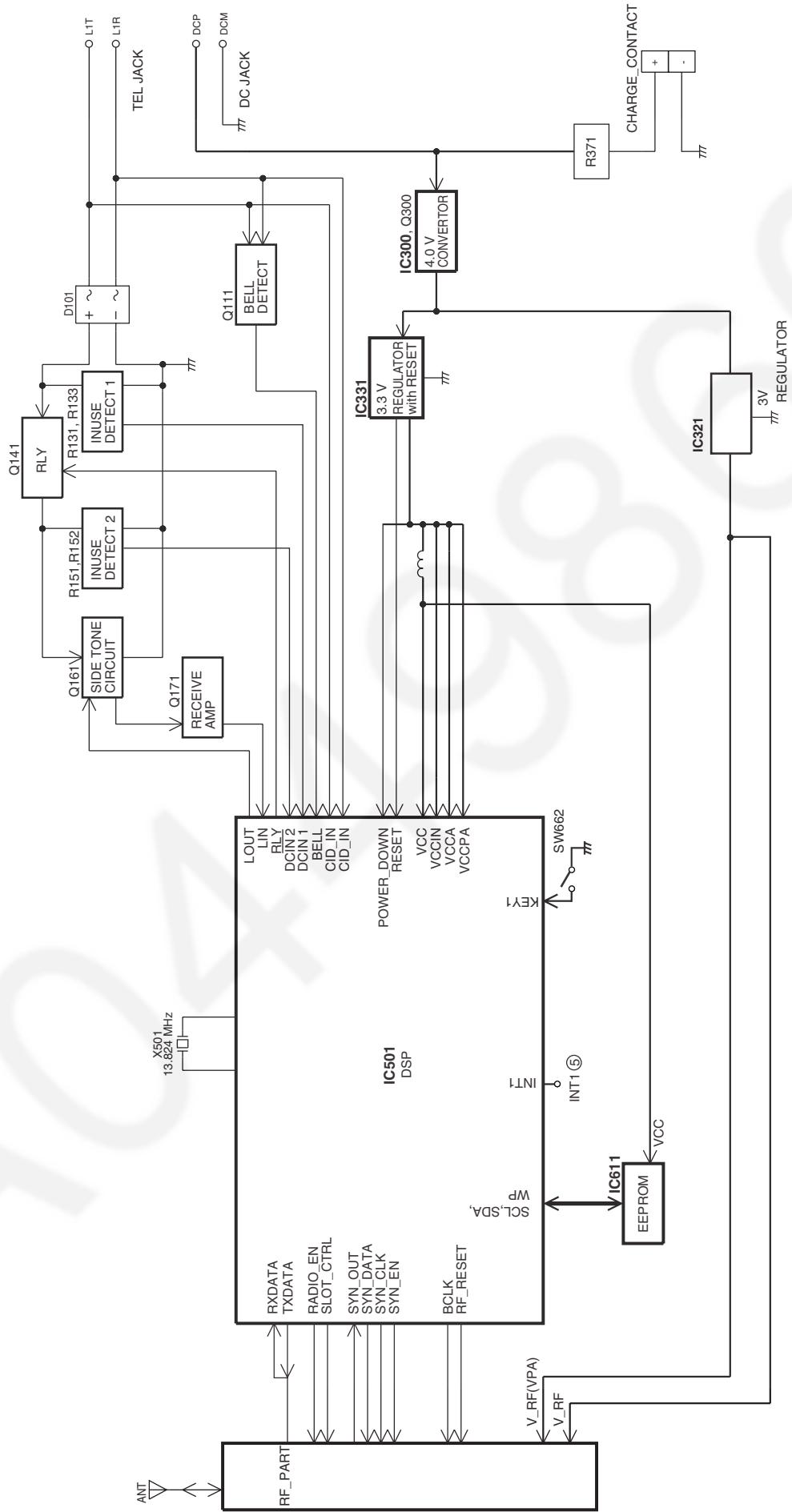
4.2.2. To Terminate Communication



4.2.3. Ringing

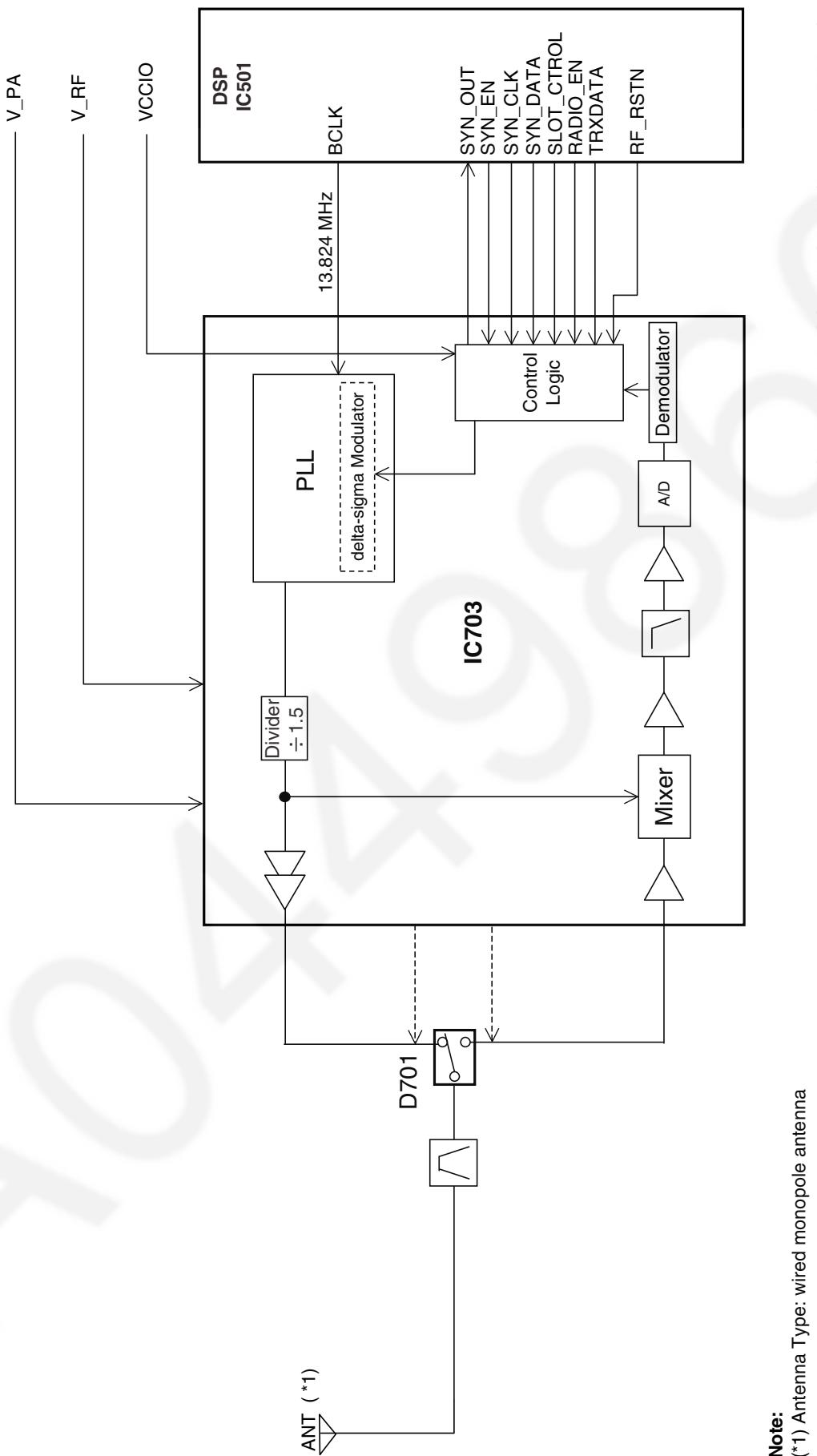


4.3. Block Diagram (Base Unit_Main)



KX-TG3611/3612 BLOCK DIAGRAM (Base Unit_Main)

4.4. Block Diagram (Base Unit_RF Part)



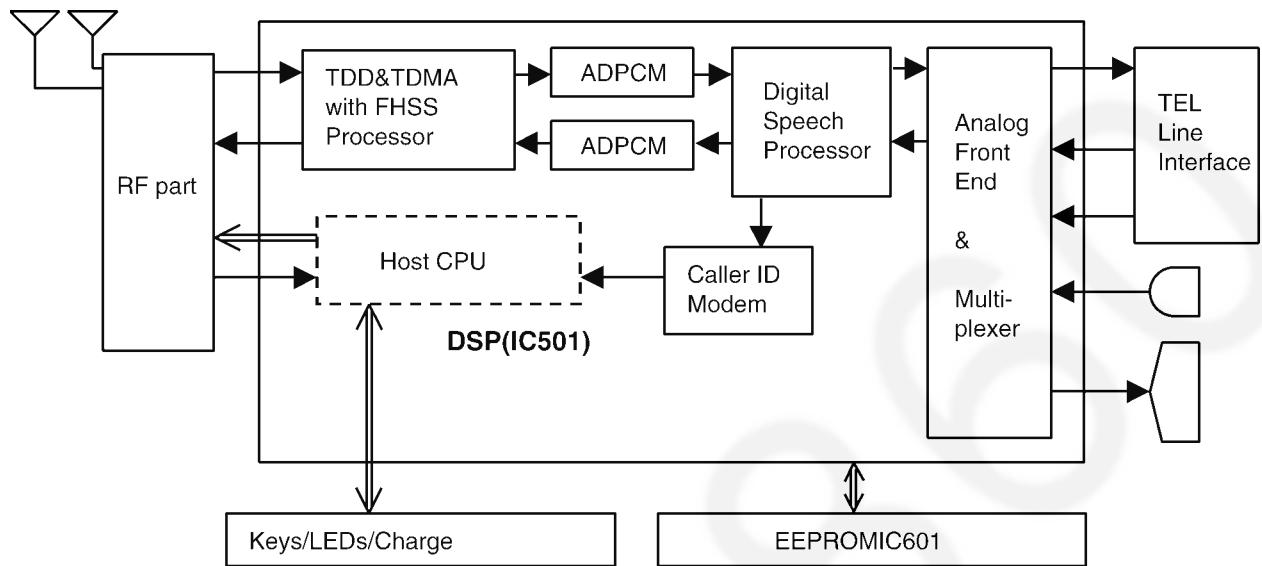
Note:
(*1) Antenna Type: wired monopole antenna

KX-TG3611/3612 BLOCK DIAGRAM (Base Unit_RF Part)

4.5. Circuit Operation (Base Unit)

General Description:

(DSP, EEPROM) is a digital speech/signal processing system that implements all the functions of speech compression. The DSP system is fully controlled by a host processor DSP. The host processor provides activation and control of all that functions as follows.



4.5.1. 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 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, Telephone line.

4.5.2. EEPROM (IC601)

Following information data is stored.

- **Settings**

ex: ID code, Flash Time, Tone/Pulse

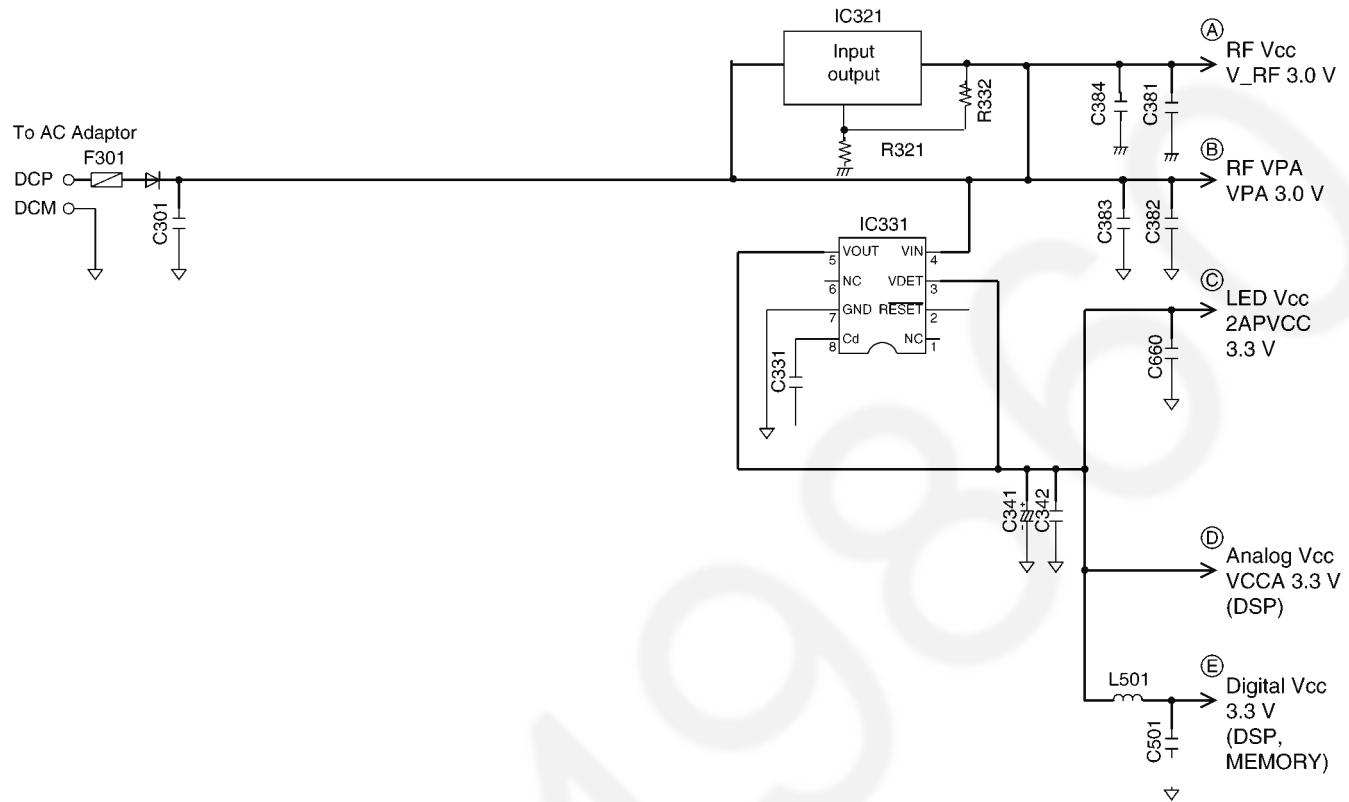
4.5.3. Power Supply Circuit

Function:

The power supply voltage from AC adaptor is converted to the desired voltage of each block.

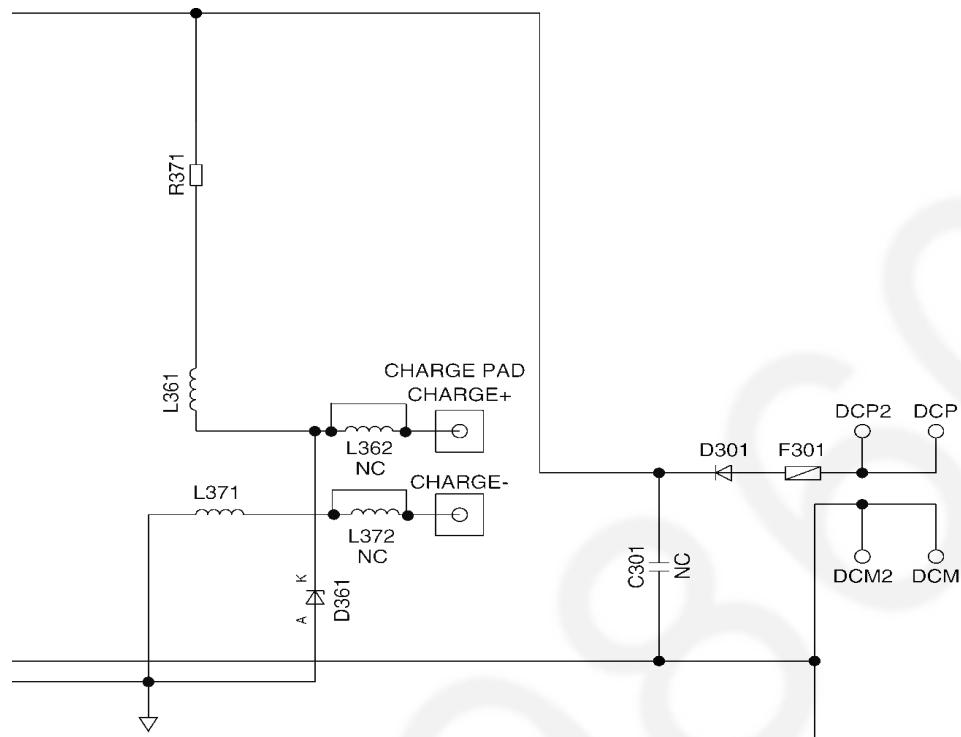
Circuit Operation:

- IC332: 3.3 V Regulator
- IC331: 3.0 V Regulator



4.5.3.1. Charge Circuit

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



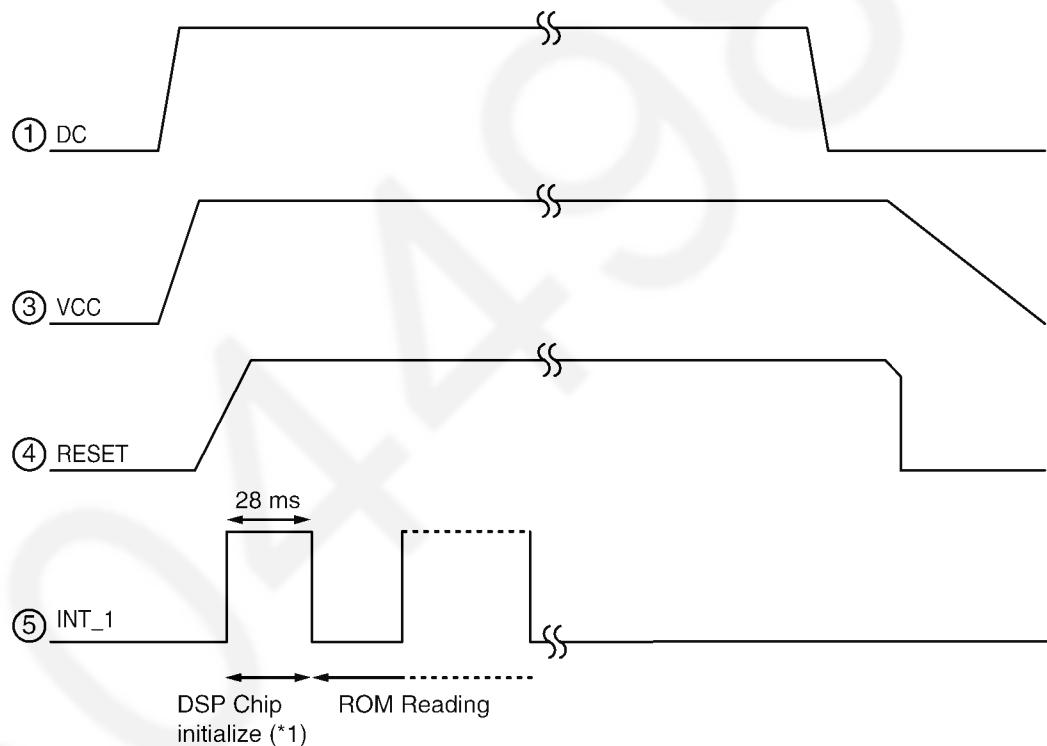
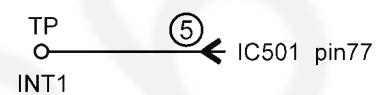
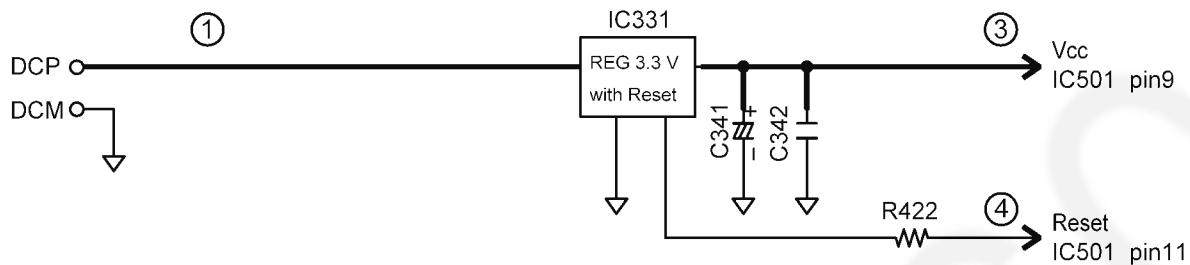
4.5.4. Reset Circuit

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.

4.5.5. 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:

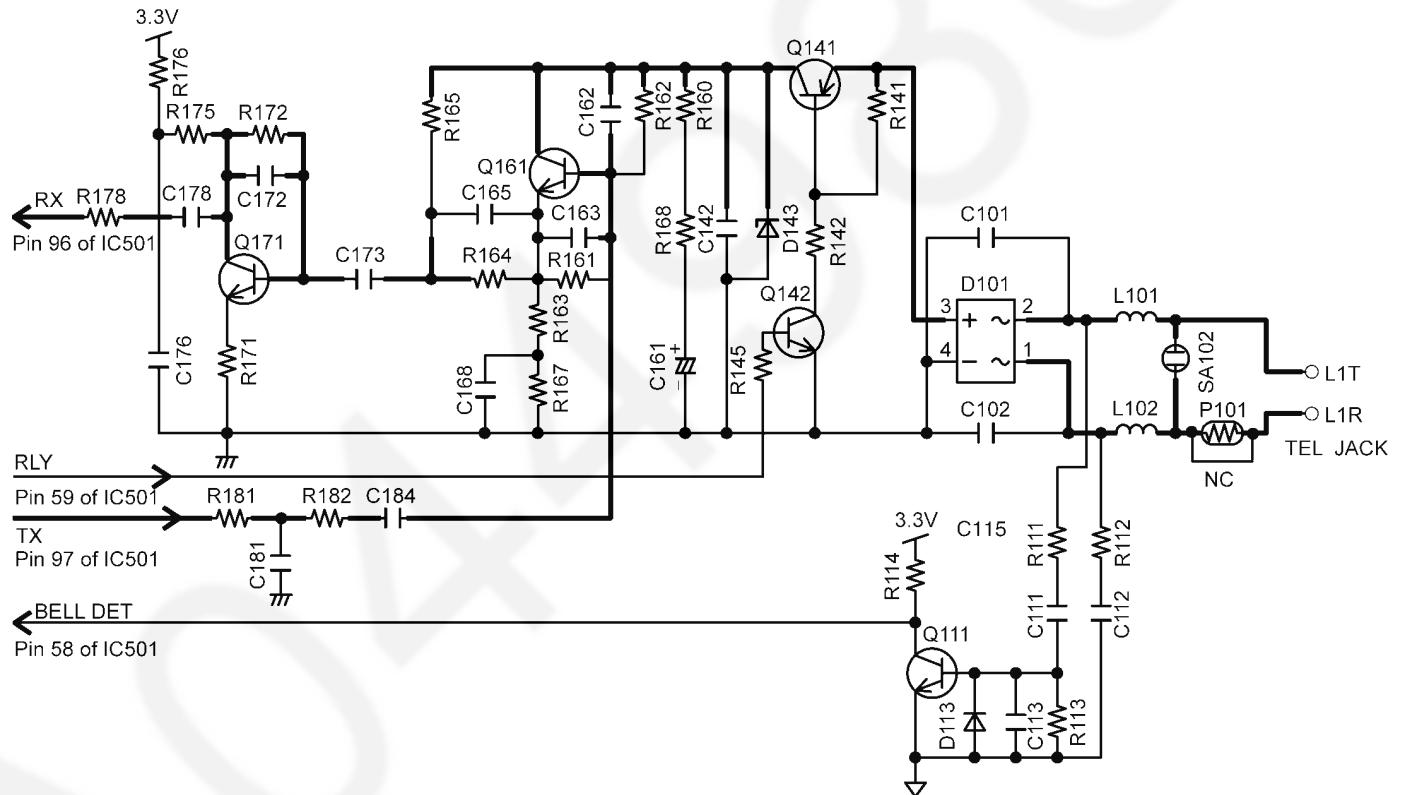
Q141 is open, Q141 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

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.



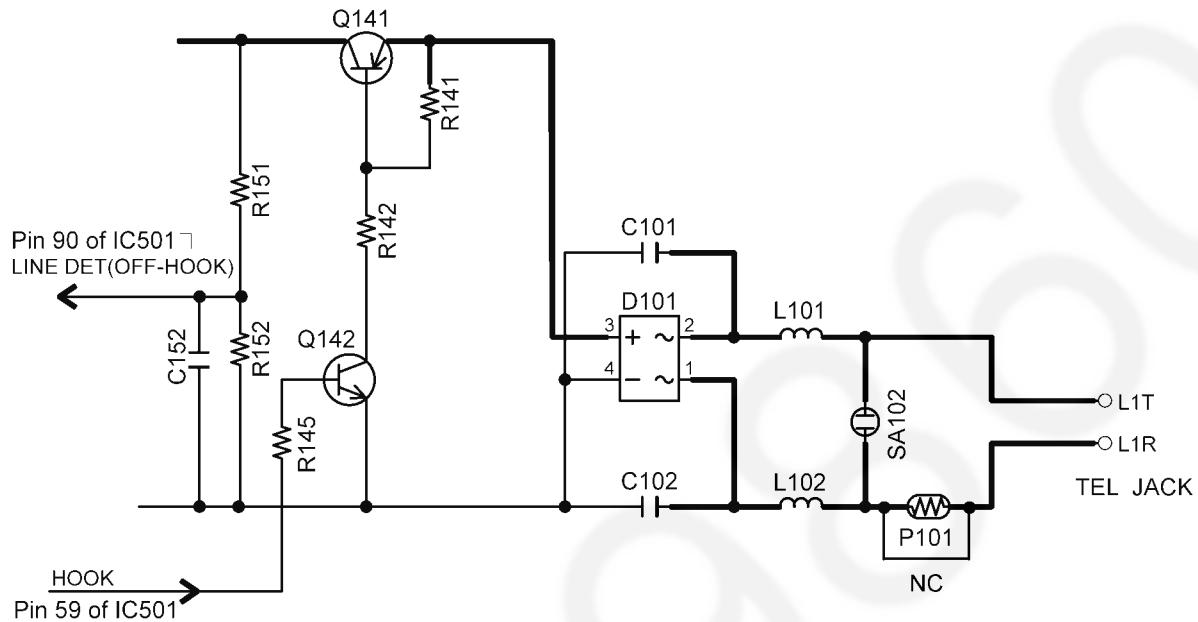
4.5.6. Auto Disconnect Circuit

Function:

This circuit is used to detect the fact that another telephone connected to the same line is OFF-HOOK while the unit is in a receiving status or OGM transmitting status.

Circuit Operation:

The voltage of pin 90 of IC501 is monitored. If a parallel-connected telephone is put into OFF HOOK status, the presence/absence of a parallel connection is determined when the voltage changes by 0.2 V or more. When the set detects the parallel-connected telephone is OFF HOOK status, the line is disconnected.



You can enable or disable the Auto Disconnect function.

4.5.7. 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.

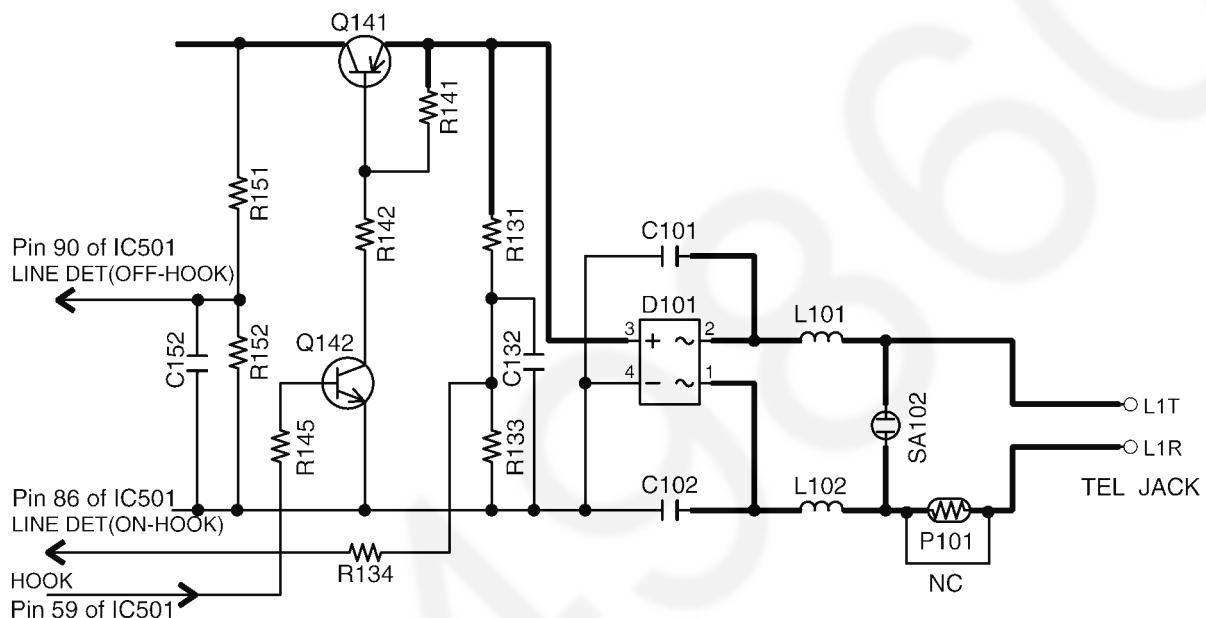
Circuit Operation:

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.



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

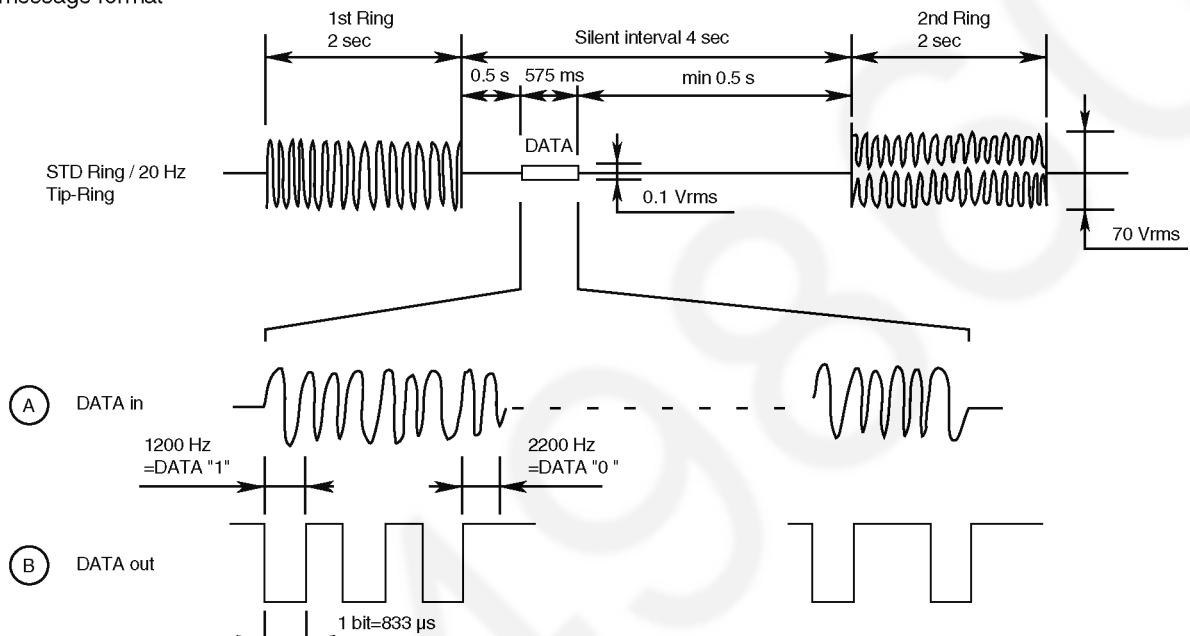
Function:

Caller ID

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

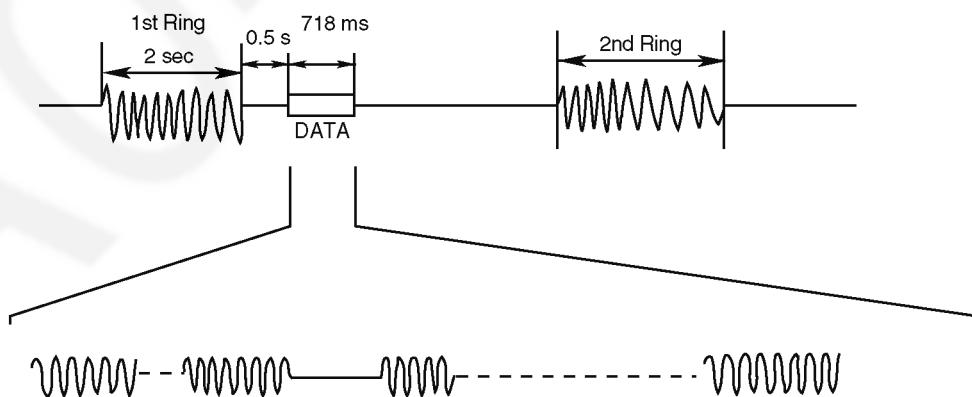
*: Also the telephone exchange service provides other formats.

- Single message format



month	day	hour	minute	number
04	15	16	35	2013487000

- Plural message format



DATA CODE	NAME
201	John Smith

month	day	hour	minute	number
04	16	16	35	2013487000

Call Waiting Caller ID

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

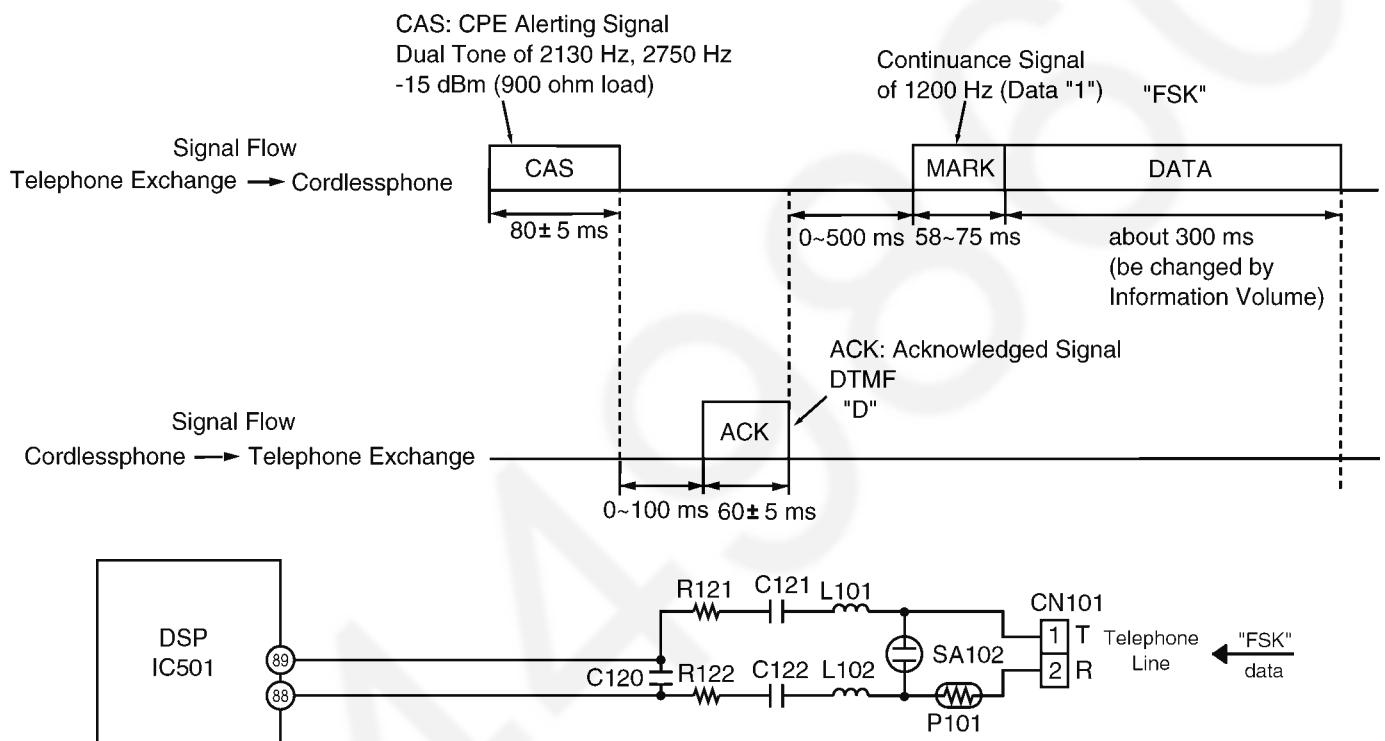
Function:

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

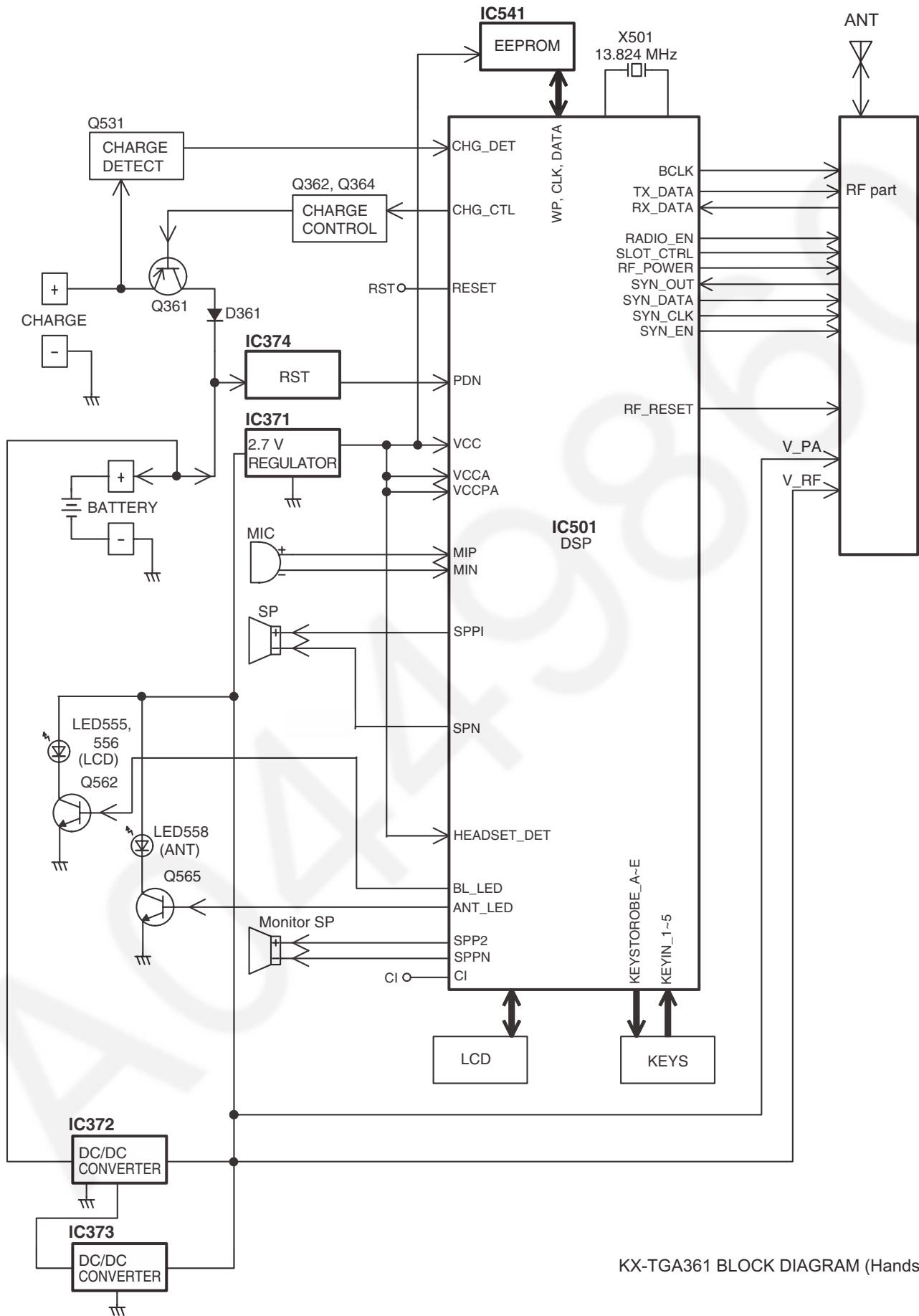
Telephone Line → CN101 (T, R) → P101 → L101, L102 → C121, C122 → R121, R122 → IC501 (88, 89).

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

Call Waiting Format

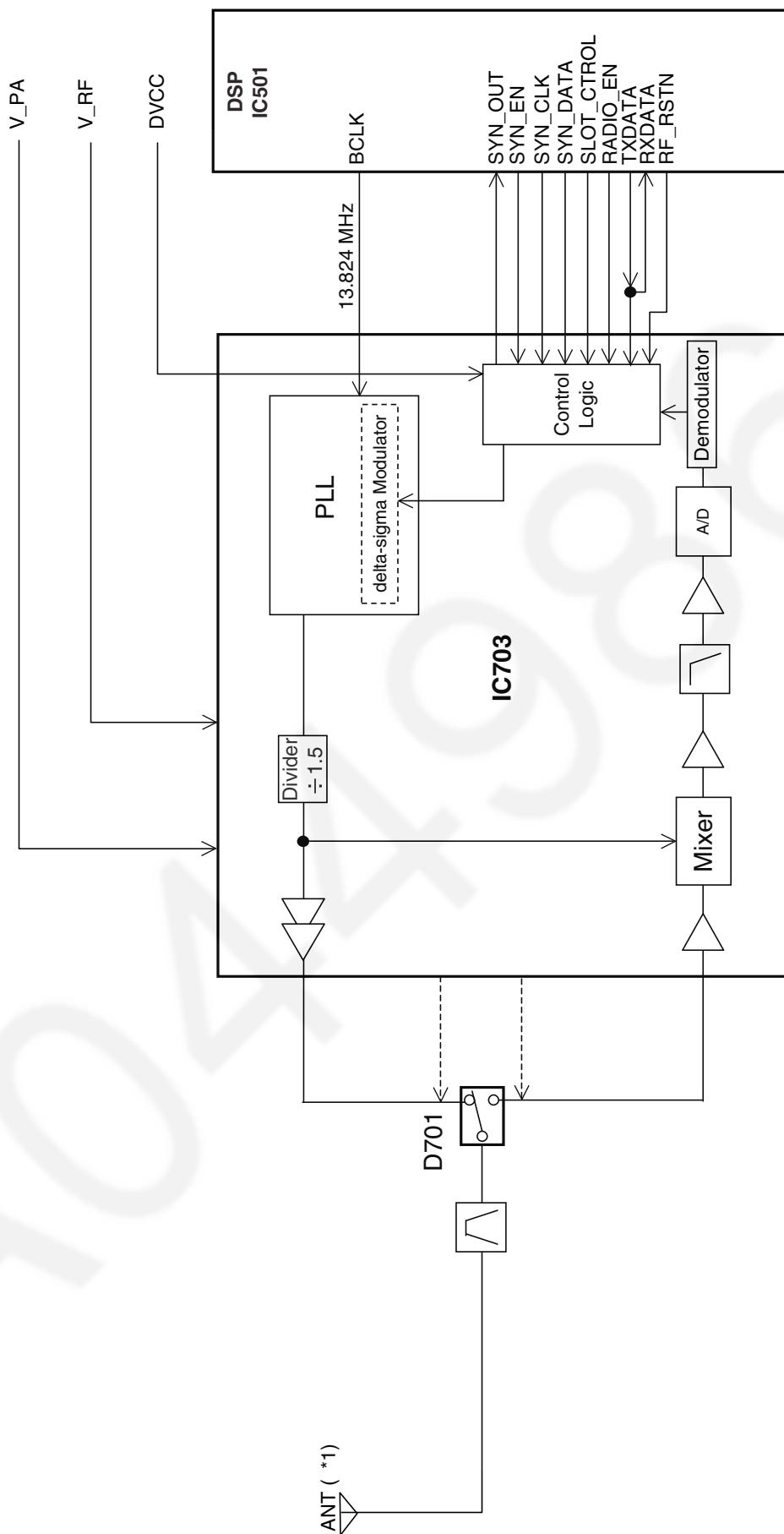


4.6. Block Diagram (Handset)



KX-TGA361 BLOCK DIAGRAM (Handset)

4.7. Block Diagram (Handset_RF Part)



Note:
(*1) Antenna Type: patterned antenna

4.8. Circuit Operation (Handset)

4.8.1. Construction

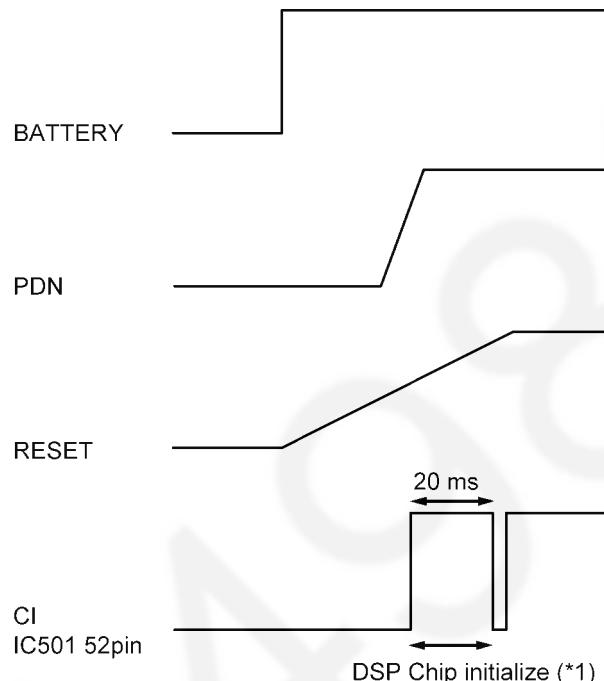
The circuit mainly consists of DSP and RF part as shown in the block diagram.

4.8.1.1. DSP: IC501

Function

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

Initial waves



Note:

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

4.8.1.2. RF part

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

4.8.1.3. EEPROM: IC541

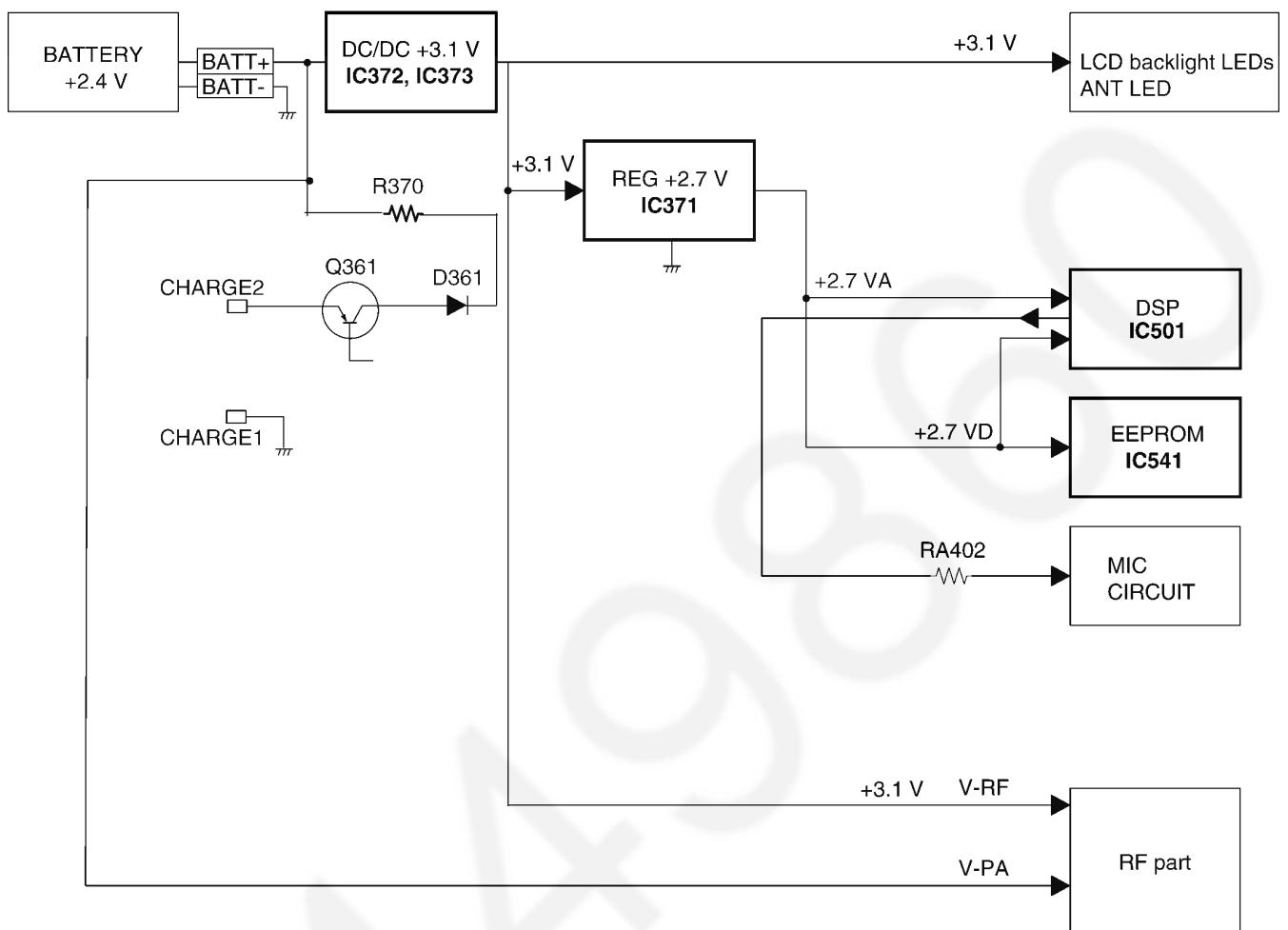
All setting data is stored.

ex: ID code, user setting (Phonebook, Caller ID data)

4.8.2. Power Supply Circuit

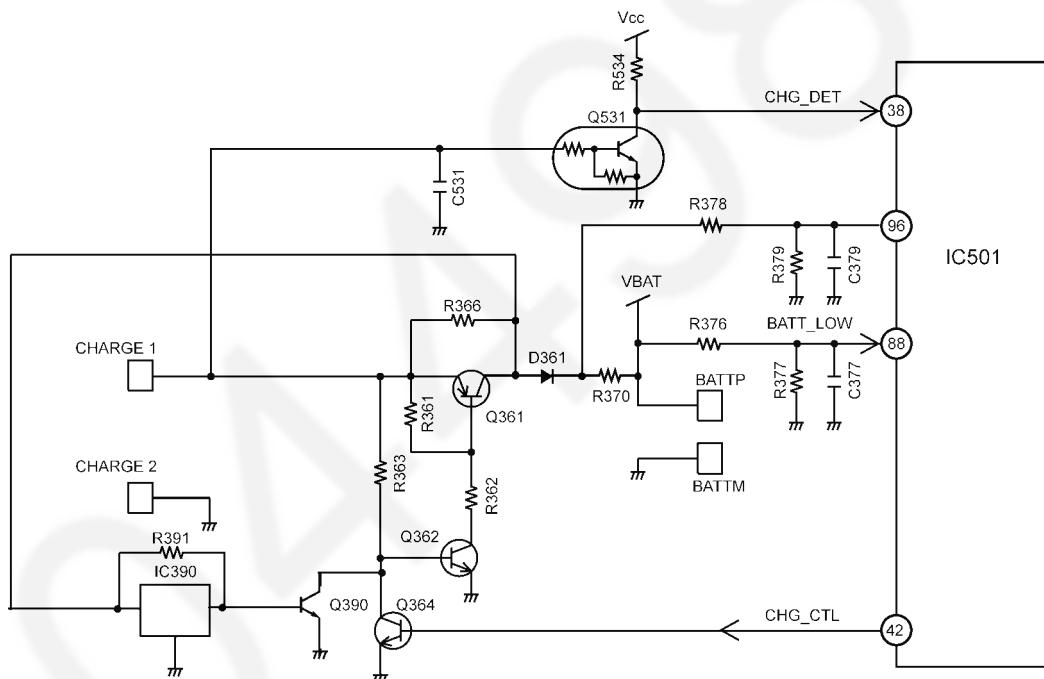
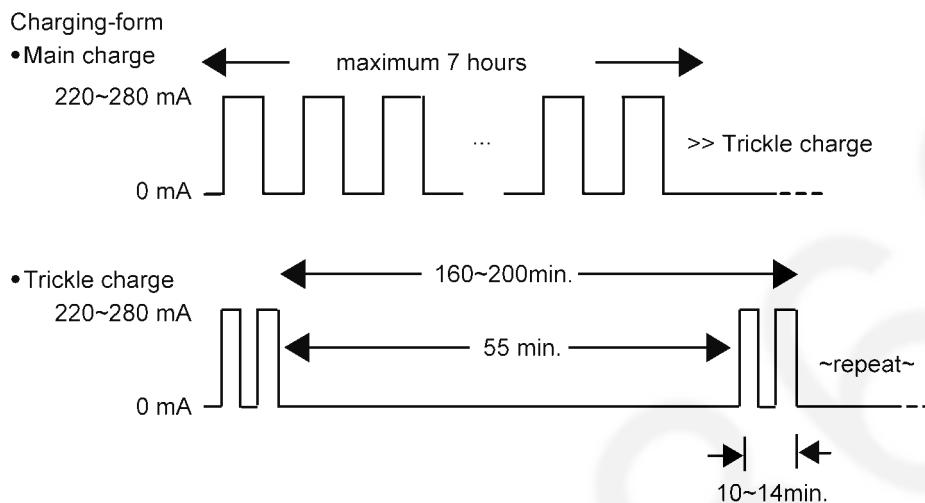
Voltage is supplied separately to each block.

Block Diagram (Handset Power)



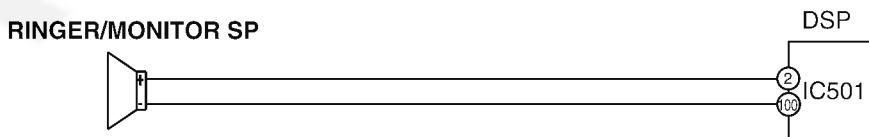
4.8.3. Charge Circuit

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.



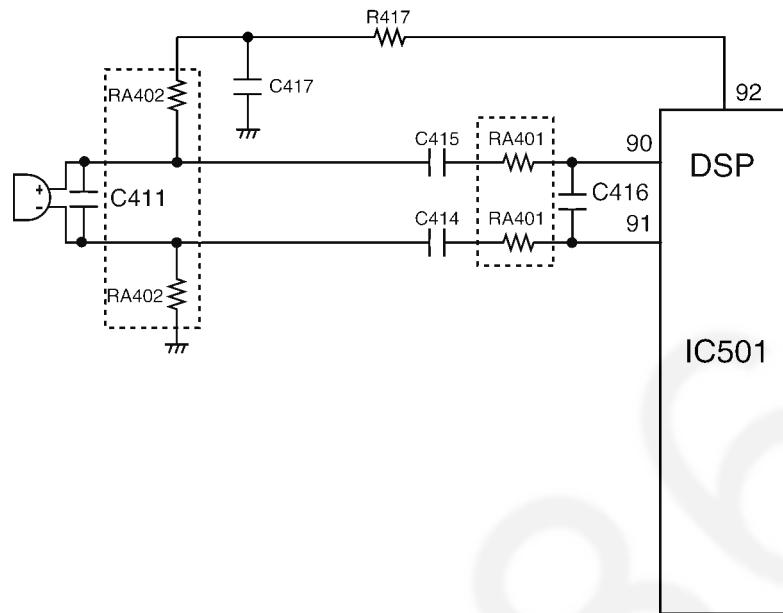
Pin 88 of IC501 monitors the battery voltage and detect BATT LOW at 2.34 V.

4.8.4. Ringer and Handset SP-Phone



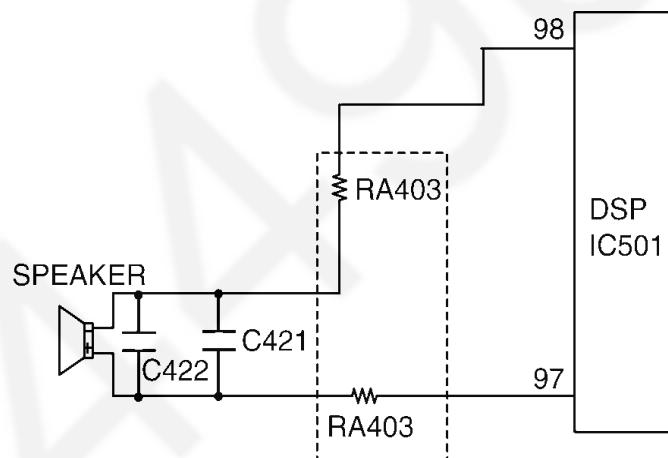
4.8.5. Sending Signal

The voice signal from the microphone is input to DSP (90, 91). Also the power for the microphone is supplied from DSP (92) and the power is turned OFF on standby.



4.8.6. Reception Signal

The voice signal from the base unit is output from DSP (97,98) drives the speaker.



4.9. Circuit Operation (RF Part)

General Description:

RF part includes Transmitter and Receiver functions. Digital signals (Mainly voice data) that come from DSP(IC501), are modulated and are transmitted. On the other hand, received signals are demodulated and go out to DSP(IC501).

4.9.1. Power Supply Circuit

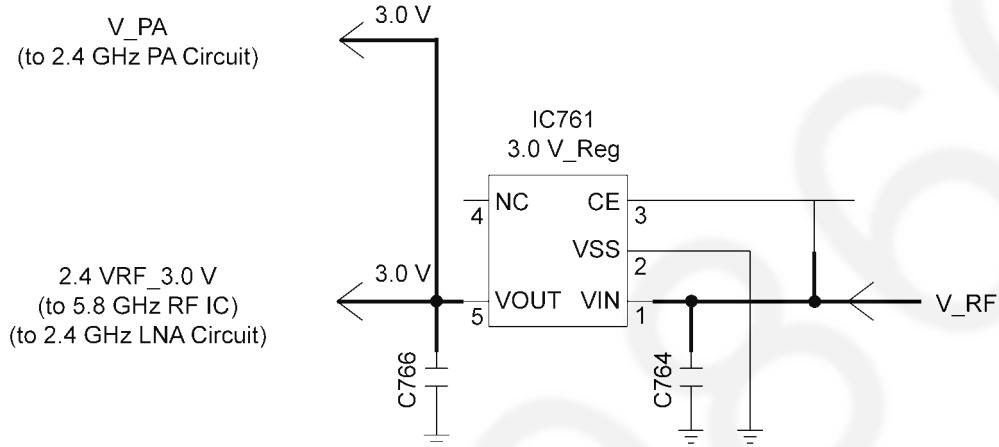
As indicated below, the various voltages are supplied to each block.

V_{PA} , about 3.0 V at base unit or 2.6 V at handset, is supplied to the Power amplifier in 2.4 GHz PA circuit.

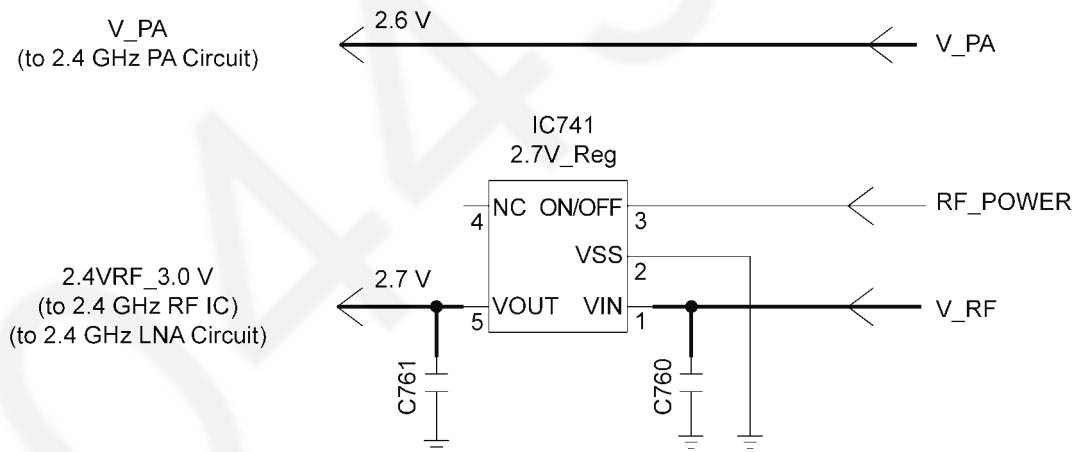
IC761 is 3.0 V Regulator and outputs VRF (3.0 V) by order of RADIO_EN signal.

V_{RF} is approximately 4.0 V (Base Unit) or 3.6 V (Handset).

<Base Unit>



<Handset>



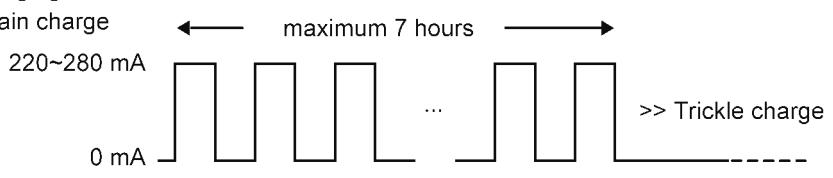
4.10. Circuit Operation (Charger Unit)

The voltage from the AC adaptor is supplied to the charge circuits. Main charge (180~250 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

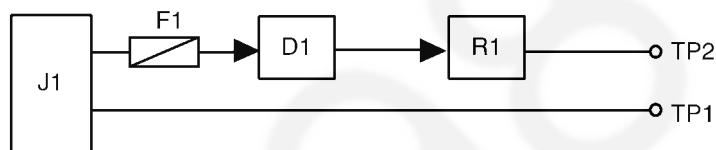
Charging-form

•Main charge



Handset controls
Charging-form pattern.

•Trickle charge



AC Adaptor

The route for this is as follows: DC+pin of J1(+) → F1 → D1 → R1 → CHARGE+pad → Handset → CHARGE-pad → DC-pin of J1(-).

4.11. Signal Route

SIGNAL ROUTE	IN	→	ROUTE	→	OUT
HANDSET TX			HANDSET MIC-L412/L413 - 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) - /RA403- HANDSET SPEAKER		
HANDSET SP-Phone TX			HANDSET MIC - 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(88/89)		
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]			IC703 -(20-9/10) - L708/C743 - C734 - D701 - C748 - C797 - ANT		
HANDSET RF [RX_ROUTE]			ANT - C797 - D701 - C740 - IC703(7/8-20)		
BASE UNIT RF [TX_ROUTE]			IC703 (20-9/10) - L708/C743 - C734 - D701 - C748 - C797 - ANT		
BASE UNIT RF [RX_ROUTE]			ANT - C797 - C748 - D701 - C740 - OC703(7/8-20)		

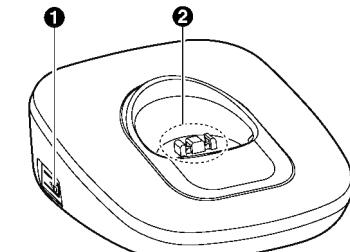
Note:

: inside of Handset

5 Location of Controls and Components

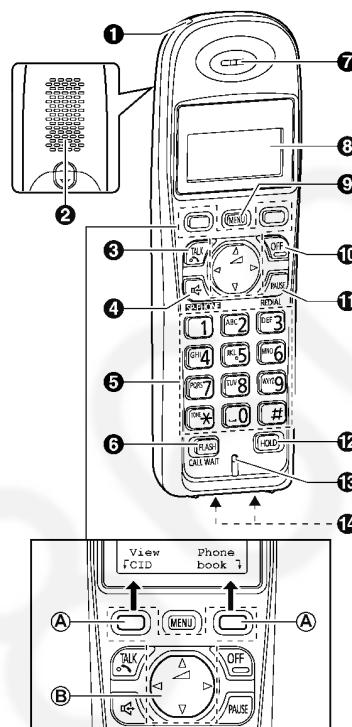
5.1. Controls

5.1.1. Base Unit



① [•] (Locator)
② Charge contacts

5.1.2. Handset



① Charge indicator
Ringer indicator
② Speaker
③ [‣] (TALK)
④ [↔] (SP-PHONE: Speakerphone)
⑤ Dial keypad ([*]: TONE)
⑥ [FLASH] [CALL WAIT]
⑦ Receiver
⑧ Display
⑨ [MENU]
⑩ [OFF]
⑪ [PAUSE] [REDIAL]
⑫ [HOLD]
⑬ Microphone
⑭ Charge contacts

■ Control type

Ⓐ Soft keys

The handset features 2 soft keys. By pressing a soft key, you can select the feature shown directly above it on the display.

Ⓑ Navigator key/◀ (Volume) key

By pressing this key ([▲], [▼], [◀], 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

5.2. Display

Handset display items

Item	Meaning
■■■	Battery level
[1]	Handset number*1
Line in use	Someone is using the line.

*1 KX-TG3612

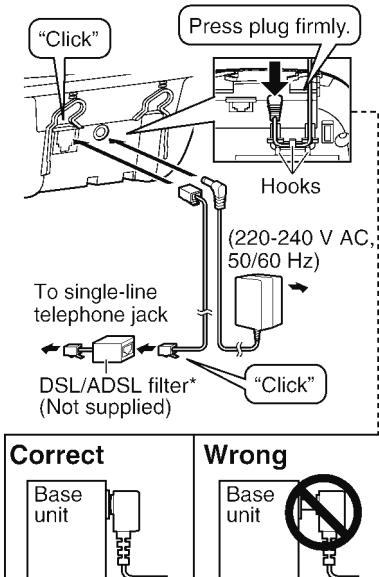
6 Installation Instructions

6.1. Setting up

6.1.1. Connections

- Use only the supplied Panasonic AC adaptor PQLV219BXZ.

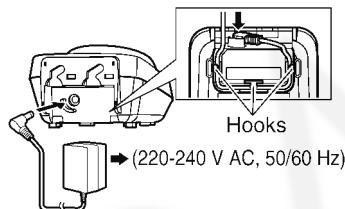
Base unit



*For DSL/ADSL service users

Charger

- Use only the supplied Panasonic AC adaptor PQLV219BXZ.



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.

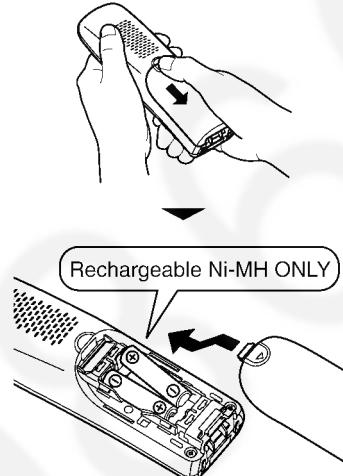
During a power failure

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.

6.2. Battery Installation and replacement

Important:

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



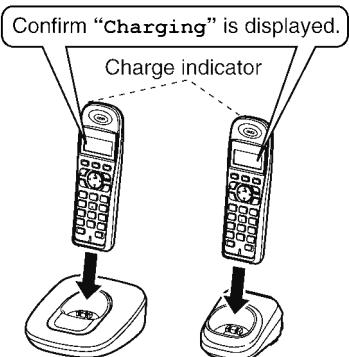
Note:

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

6.3. 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.

6.3.1. 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.

6.3.2. 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.

7.1.1. Programming by Scrolling through the Display Menus

- 1 [MENU]
- 2 Press [▼] or [▲] to select the desired main menu. → [Select]
- 3 Press [▼] or [▲] to select the desired item in sub-menu 1. → [Select]
 - In some cases, you may need to select from sub-menu 2. → [Select]
- 4 Press [▼] or [▲] to select the desired setting. → [Save]
 - This step may vary depending on the feature being programmed.
 - To exit the operation, press [OFF].

Main menu	Sub-menu 1	Sub-menu 2
Night mode	On/Off	–
	Start/End	–
Ringer setting	Ringer volume	–
	Ringer tone	–
Set date & time	Date and time ^{*1}	–
	Alarm	–
	Time adjustment ^{*1}	–
Dial lock ^{*1}	–	–
Initial setting	LCD contrast	–
	Key tone	–
	Auto talk	–
	Set area code ^{*1}	–
	Set tel line	Set dial mode ^{*1} Set flash time ^{*1} Set line mode ^{*1}
	Registration	HS registration Deregistration

*1 If you program these settings using one of the handsets, you do not need to program the same item using another handset. (KX-TG3612)

7.1.2. Programming using the Direct Commands

- 1 [MENU] → [#]
- 2 Enter the desired feature code.
- 3 Enter the desired setting code. → [Save]
 - 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}
Alarm	[7][2][0]	[1]: Once [2]: Daily [0]: <Off>	—
Auto talk ^{*2}	[2][0][0]	[1]: On [0]: <Off>	—
Date and time	[1][0][1]	—	●
Deregistration	[1][3][1]	—	—
Dial lock	[2][5][1]	—	●
HS registration (Handset registration)	[1][3][0]	—	—
Key tone ^{*3}	[1][6][5]	[1]: <On> [0]: Off	—
LCD contrast (Display contrast)	[1][4][5]	[1]–[6]: Level 1–6 <3>	—
Night mode (On/Off)	[2][3][8]	[1]: On [0]: <Off>	—
Night mode (Start/End)	[2][3][7]	<11:00 PM/06:00 AM>	—
Ringer tone ^{*4} (Handset)	[1][6][1]	[1]–[3]: Tone <1>–3 [4]–[7]: Melody 1–4	—
Ringer volume ^{*5} (Handset)	[1][6][0]	[1]: Low [2]: Medium [3]: <High> [0]: Off	—
Set area code	[2][5][5]	—	●
Set dial mode	[1][2][0]	[1]: Pulse [2]: <Tone>	●
Set flash time ^{*6}	[1][2][1]	[1]: <700ms> [2]: 600ms [3]: 400ms [4]: 300ms [5]: 250ms [6]: 110ms [7]: 100ms [8]: 90ms	●
Set line mode ^{*7}	[1][2][2]	[1]: A [2]: 	●
Time adjustment ^{*8} (Caller ID subscribers only)	[2][2][6]	[1]: Caller ID [auto] [0]: <Manual>	●

*1 If "System setting" column is checked, you do not need to program the same item using another handset. (KX-TG3612)

*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, "Ringer off" 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 "Line in use" 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. Dial Lock

Important:

- Anyone can turn off the dial lock using the following method. Be sure to keep this service manual in a safe place in order to prevent unauthorized persons from using your phone without permission.

Problem	Cause/solution
I cannot remember the dial lock password.	<ul style="list-style-type: none"> • Turn the dial lock off using the following method. <p>1 [MENU] → [‡][2][5][1] 2 Press [*][7][0][0]. 3 [Save] → [Yes] → [OFF]</p>

7.3. Error Messages

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

Display message	Cause/solution
Busy or System is busy. Please try again later.	<ul style="list-style-type: none"> • The called handset is in use.*1 • Another handset is in use and the system is busy. Try again later.*1 • 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.
Check tel line	<ul style="list-style-type: none"> • The supplied telephone line cord has not been connected yet or not connected properly. Check the connections.
Dial locked	<ul style="list-style-type: none"> • Dial lock is turned on. To turn it off, see “Dial Lock” in “Troubleshooting”.
Don't use this battery.	<ul style="list-style-type: none"> • A wrong type of battery such as Alkaline or Manganese was inserted. Use only the rechargeable Ni-MH batteries.
Error!!	<ul style="list-style-type: none"> • The handset's registration has failed. Move the handset and base unit away from all electrical appliances and try again. • The entered password was wrong in programming dial lock. Enter the correct password.
Invalid	<ul style="list-style-type: none"> • There is no handset registered to the base unit matching the handset number you entered.*1 • The handset's registration may have been canceled. Re-register the handset.
No link to base. Reconnect AC adaptor.	<ul style="list-style-type: none"> • 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.

*1 KX-TG3612

Cross reference:

Dial Lock in **Troubleshooting** (P.37)

7.4. 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.	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • 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.

Programmable settings

Problem	Cause/solution
While programming, the handset starts to ring.	<ul style="list-style-type: none"> • A call is being received. Answer the call and start again after hanging up.

Battery recharge

Problem	Cause/solution
The handset beeps and/or  flashes.	<ul style="list-style-type: none"> • Battery charge is low. Fully charge the batteries.
I fully charged the batteries, but  still flashes or  is displayed.	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • Clean the battery ends (\oplus, \ominus) and the charge contacts with a dry cloth, and charge again.

Making/answering calls, intercom

Problem	Cause/solution
Noise is heard, sound cuts in and out.	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • The ringer volume is turned off. Adjust the ringer volume. • Night mode is turned on. Turn it off.
I cannot make a call.	<ul style="list-style-type: none"> • The dialing mode may be set incorrectly. Change the setting. • The handset is too far from the base unit. Move closer and try again. • Dial lock is turned on. To turn it off, see "Dial Lock" in "Troubleshooting".

Caller ID

Problem	Cause/solution
Caller information is not displayed.	<ul style="list-style-type: none"> • You need to 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.	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • Incorrect time information from incoming Caller ID changes the time. Set the time adjustment to "Manual" (off).

Registration

Problem	Cause/solution
The handset registration may have been canceled or the communication between the base unit and the handset is unstable.	<ul style="list-style-type: none"> • Re-register the handset. <ol style="list-style-type: none"> 1 Handset: [MENU] → [‡][1][3][0] 2 Base unit: Press and hold [•]) (Locator) for about 4 seconds. (No registration tone) <ul style="list-style-type: none"> – If another registered handset starts ringing, press the same button to stop. Then repeat this step. (KX-TG3612) – The next step must be completed within 90 seconds. 3 Handset: Press [OK], then wait until a long beep sounds. → [OFF] <ul style="list-style-type: none"> – While registering, "Base registering" is displayed on another handset. (KX-TG3612) If the registration fails, try to deregister the handset. KX-TG3611 Press [MENU] → [‡][1][3][1] → [3][3][5] → [OK] → [1], then re-register it again. KX-TG3612 Use another handset to deregister the unstable handset. Press [MENU] → [‡][1][3][1] → [3][3][5] → [OK] → [1] or [2] (The handset number which you want to cancel). Try to re-register it again. • If the above remedy does not solve the problem, contact your nearest Panasonic service center.

Dial lock**Important:**

- Anyone can turn off the dial lock using the following method. Be sure to keep this service manual in a safe place in order to prevent unauthorized persons from using your phone without permission.

Problem	Cause/solution
I cannot remember the dial lock password.	<ul style="list-style-type: none"> • Turn the dial lock off using the following method. <p>1 [MENU] → [♯][2][5][1] 2 Press [*][7][0][0][0]. 3 [Save] → [Yes] → [OFF]</p>

Liquid damage

Problem	Cause/solution
Liquid or other form of moisture has entered the handset/base unit.	<ul style="list-style-type: none"> • 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.

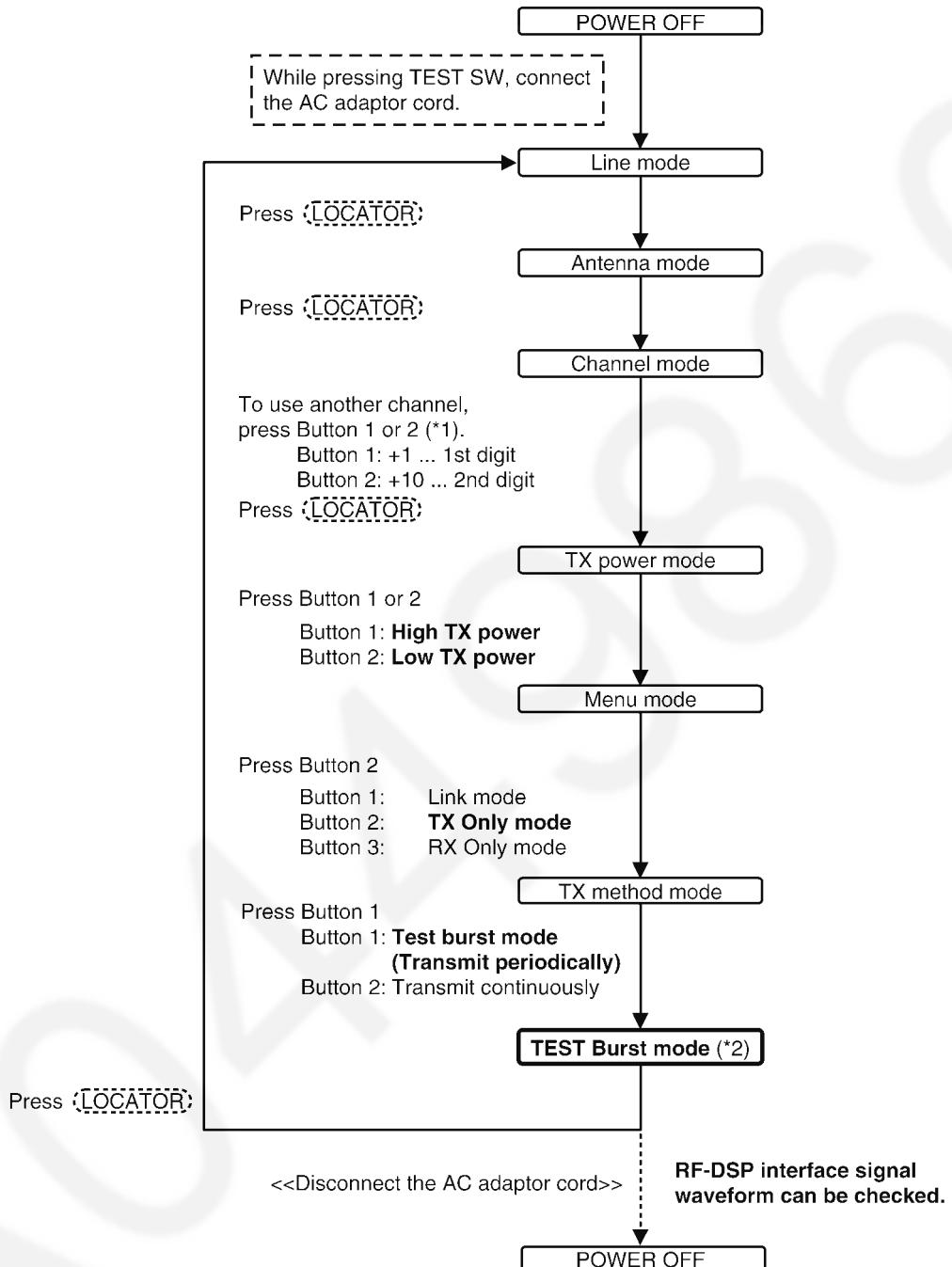
Caution:

- 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. Test Burst Mode for Base Unit

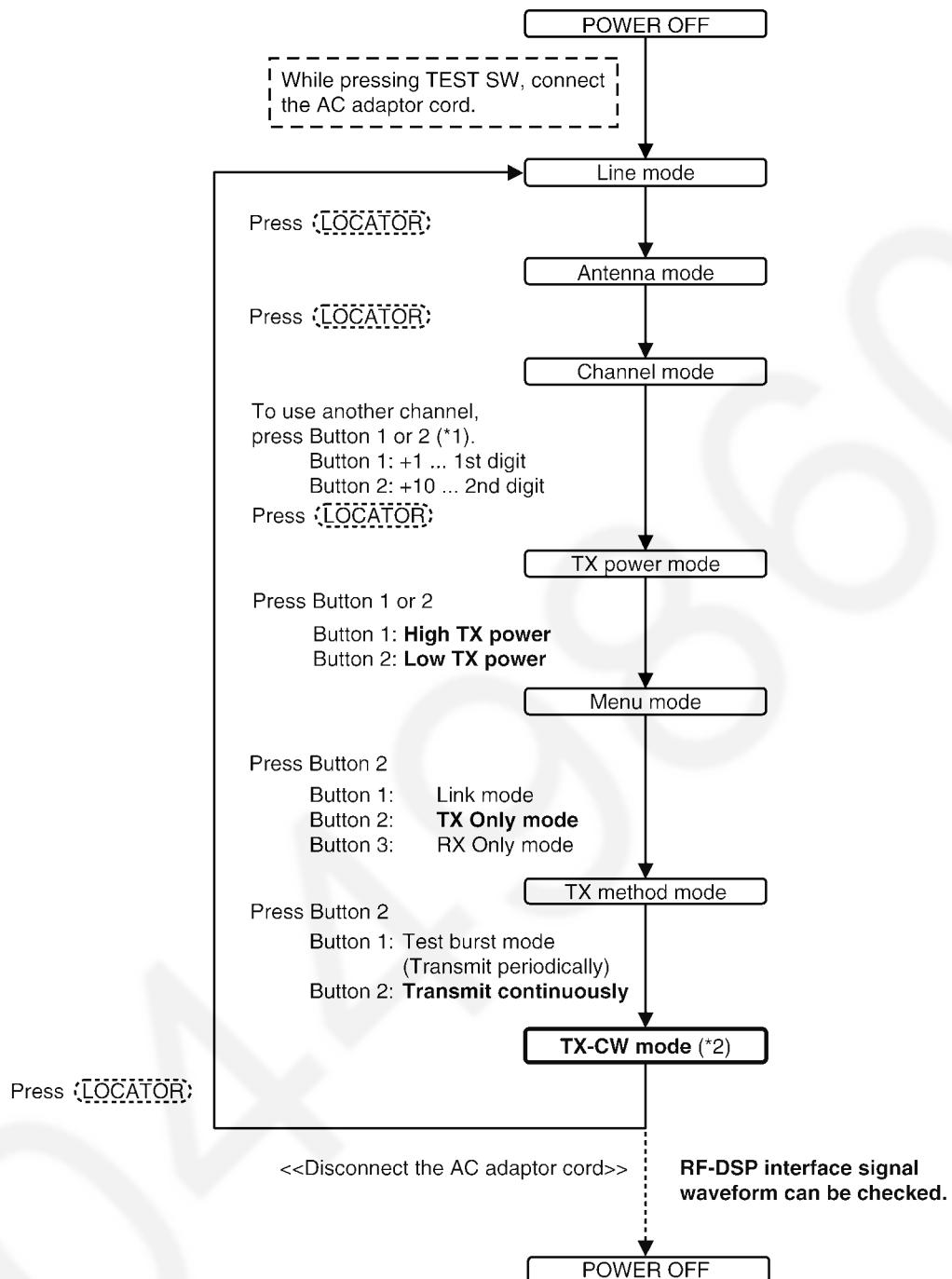


Note:

(*1) When you check test mode, connect to the external Buttons because base unit has only LOCATOR key. Refer to **Bottom View** (P.73).

(*2) Refer to **Check Table for RF part** (P.57).

8.1.2. TX-CW Mode for Base Unit

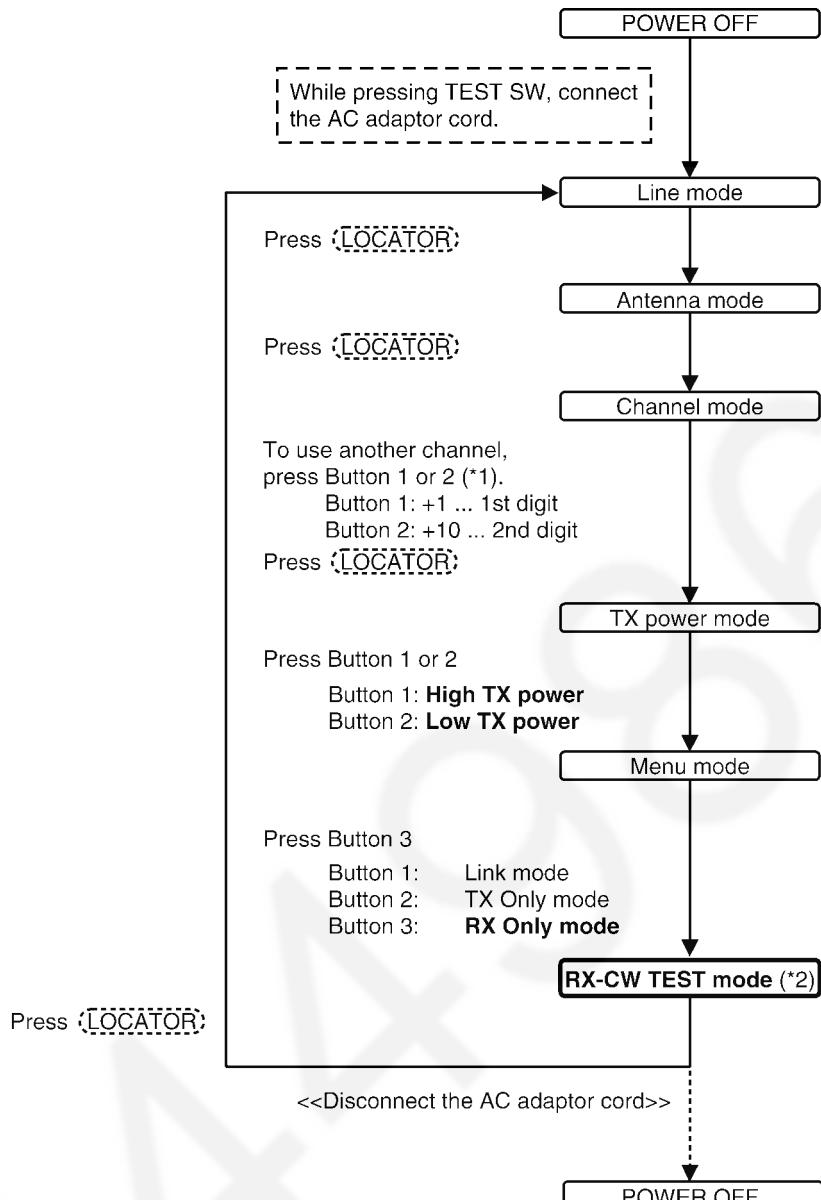


Note:

(*1) When you check test mode, connect to the external Buttons because base unit has only LOCATOR key. Refer to **Bottom View** (P.73).

(*2) Refer to **Check Table for RF part** (P.57).

8.1.3. RX-CW Test Mode for Base Unit

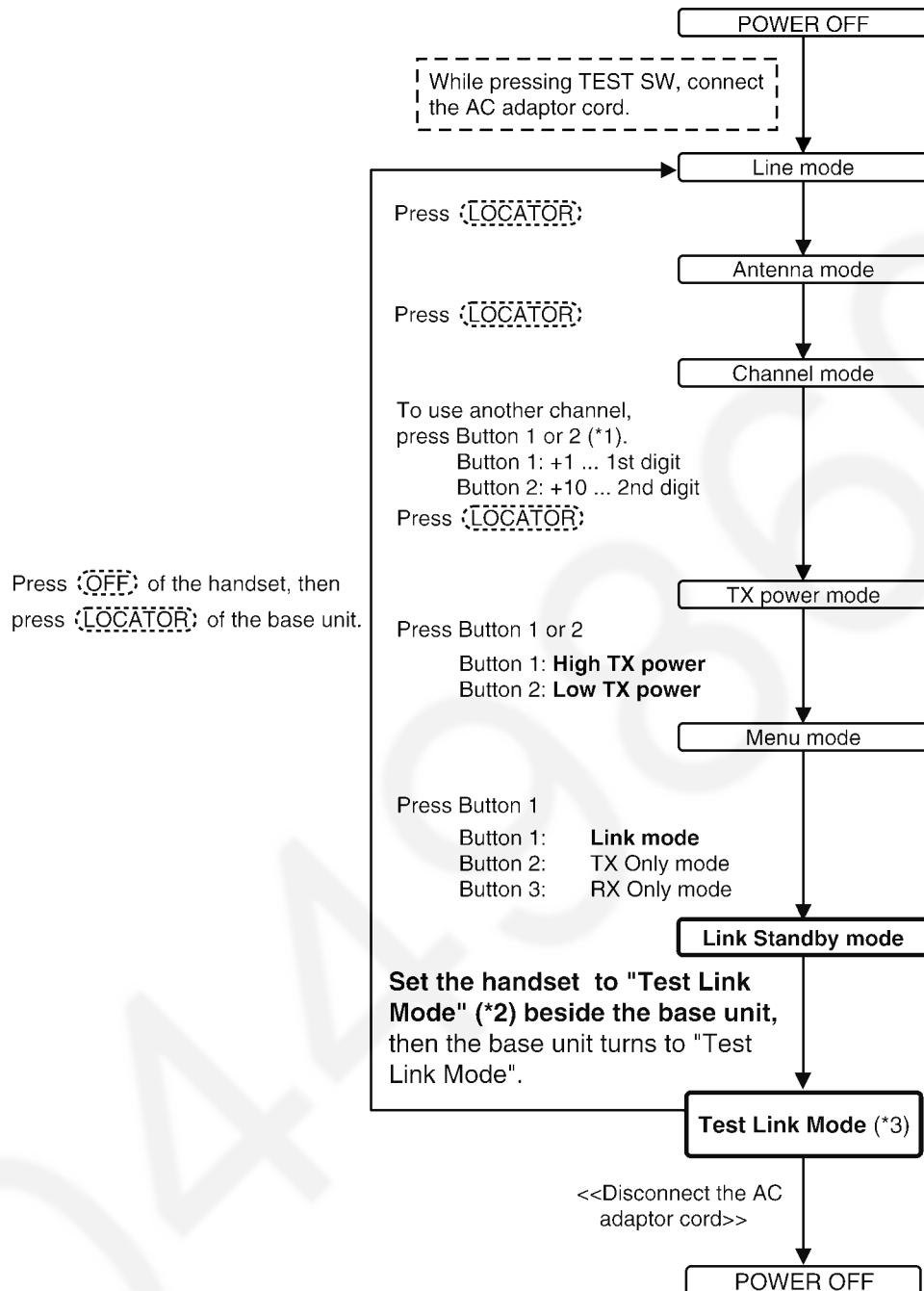


Note:

(*1) When you check test mode, connect to the external Buttons because base unit has only LOCATOR key. Refer to **Bottom View** (P73).

(*2) Refer to **Check Table for RF part** (P.57).

8.1.4. Test Link Mode for Base Unit



Note:

(*) When you check test mode, connect to the external Buttons because base unit has only LOCATOR key. Refer to **Bottom View** (P.73).

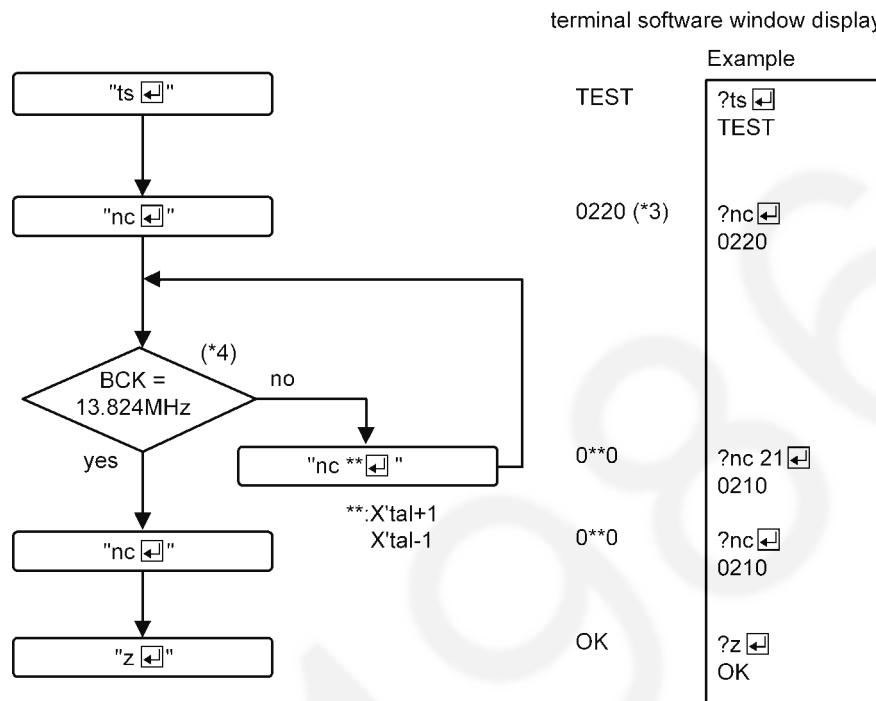
(*2) Refer to **Test Link Mode for Handset** (P.48). If you can not proceed to the next step, refer to **Registering the handset** (P.54).

(*3) Refer to **Check Table for RF part** (P.57).

8.1.5. Adjustment Mode for Base Unit

Personal Computer (PC) and the UART cable are necessary for the following operation. (*1)

1. Connect the UART cable to the base unit. (*1)
2. Connect the UART cable to the PC.
3. Connect the AC adaptor cord to the base unit.
4. Start up the terminal software in the PC. (*2)
5. Press Enter key until “?” is displayed in the terminal software window.
6. Adjust Crystal parameter according to the following steps.



7. Close the terminal software window.

8. Disconnect the AC adaptor cord.

Cross Reference

Check and Adjust X501 (Base Unit) Frequency (P.71)

Note:

(*1) Refer to **How to make a U-ART Jig (Base Unit)** (P.76)

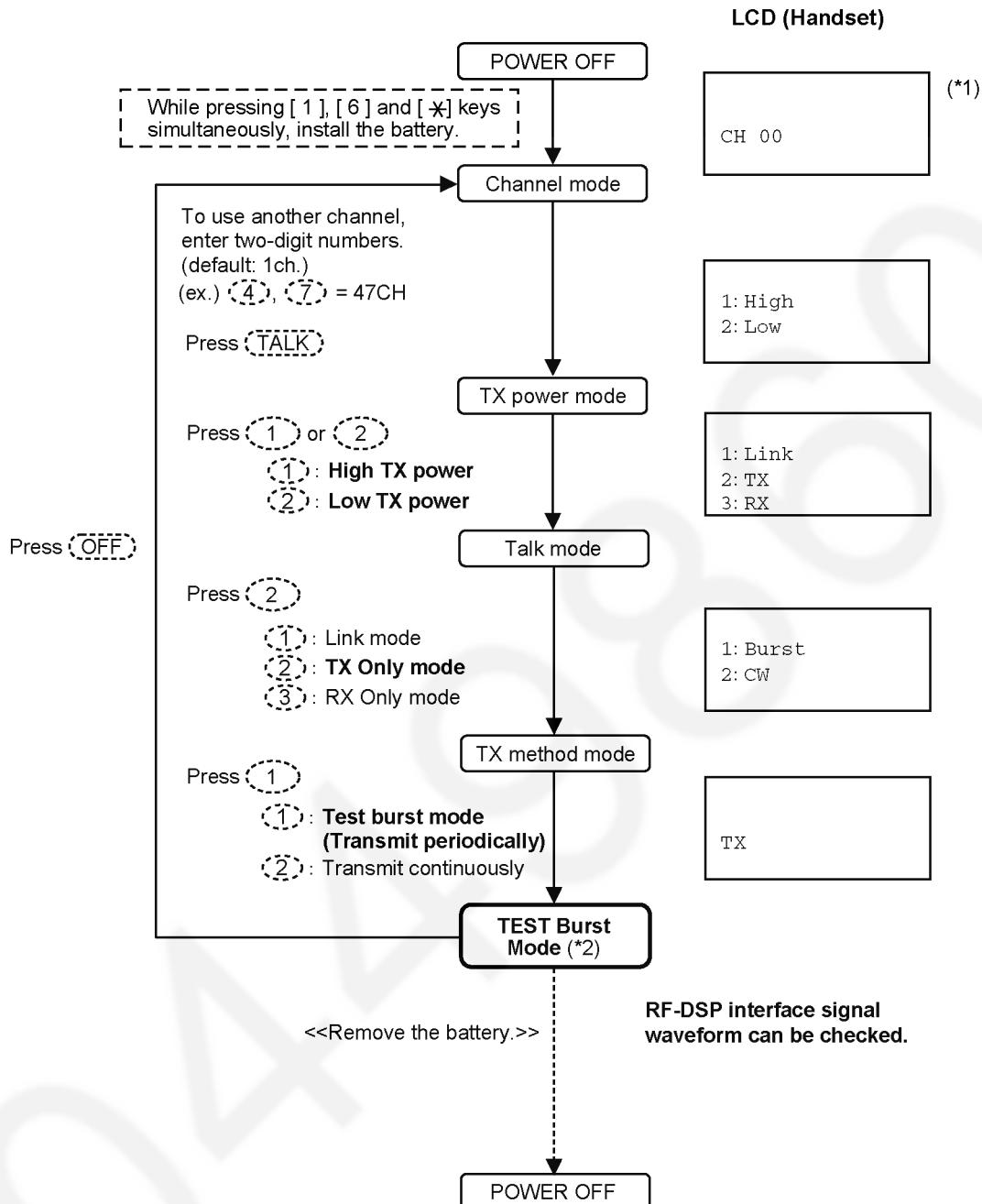
(*2) It is necessary to setup this software beforehand. Refer to **How to make a U-ART Jig (Base Unit)** (P.76)

(*3) These is the default value.

(*4) Refer to the table below, if using Frequency Counter for checking.

BCK		TEST MODE Frequency (1 Channel)
13.824 MHz	→	2401.618359 MHz
±30 Hz	→	±5.20 kHz
±100 Hz	→	±17.36 kHz

8.1.6. Test Burst Mode for Handset



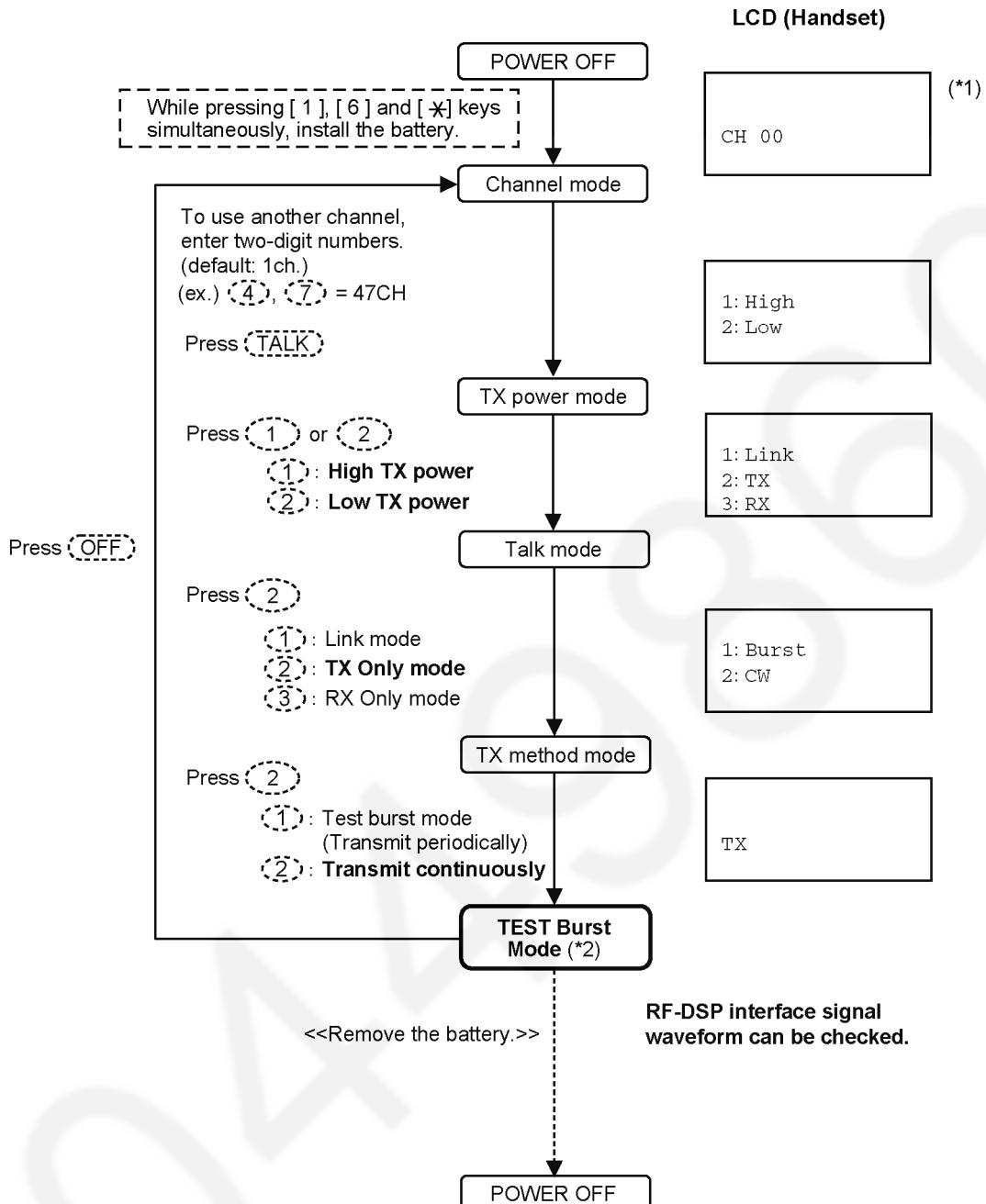
Note:

(*1) LCD displays the Channel number.

(exception: default/ CH00 = 1ch.)

(*2) Refer to **Check Table for RF part** (P.57).

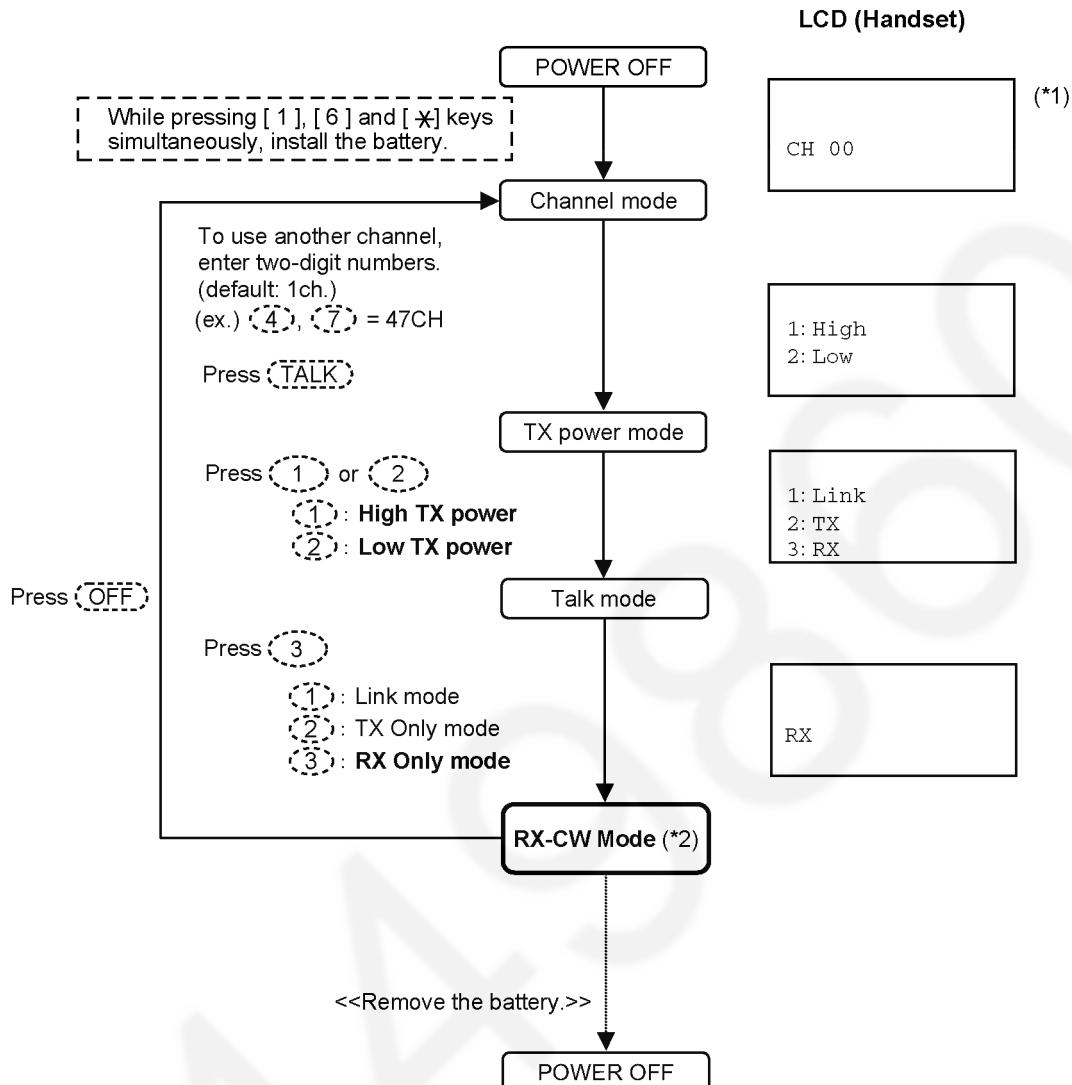
8.1.7. TX-CW Mode for Handset



Note:

- (*1) LCD displays the Channel number.
(exception: default/ CH00 = 1ch.)
- (*2) Refer to **Check Table for RF part** (P.57).

8.1.8. RX-CW Test Mode for Handset



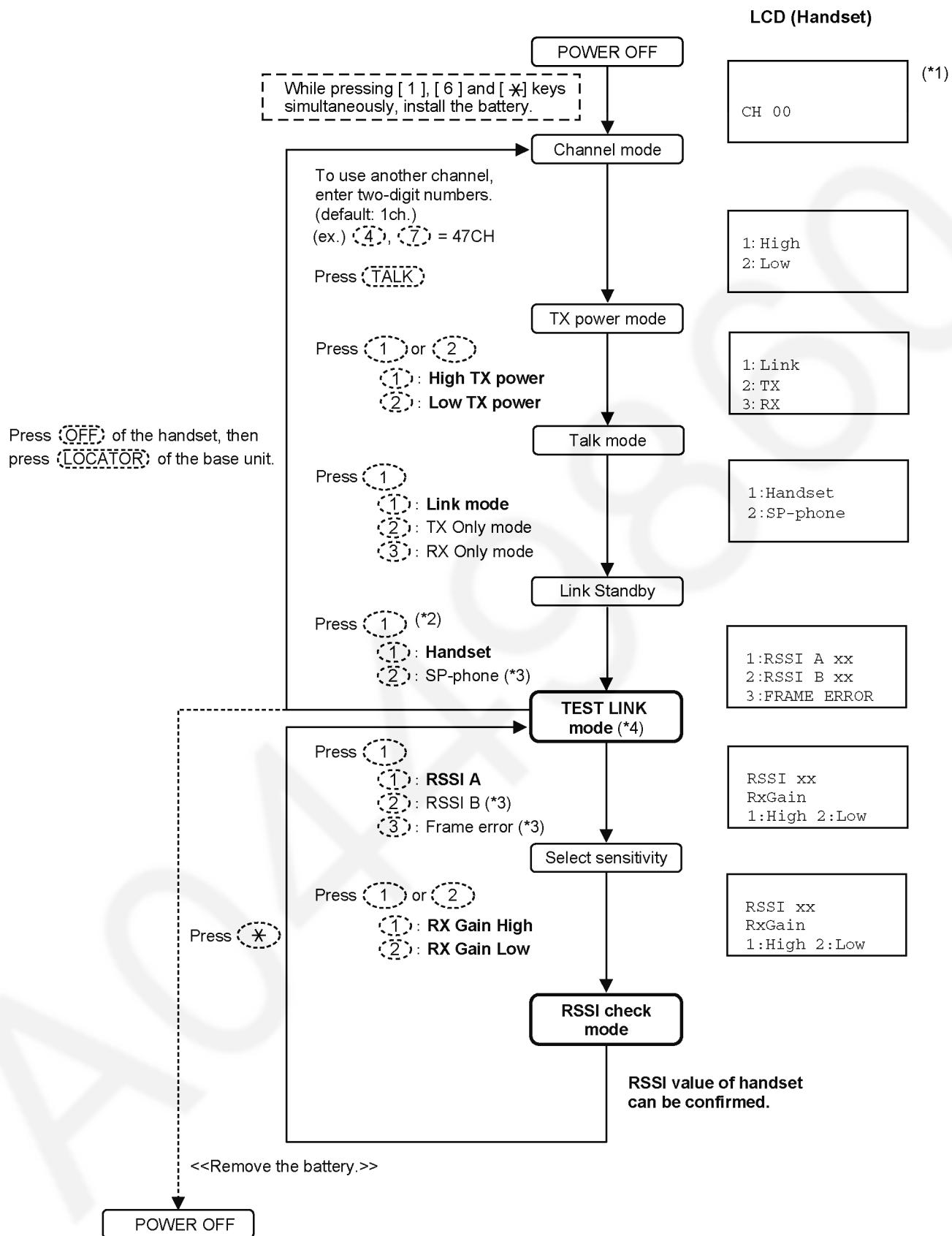
Note:

(*1) LCD displays the Channel number.

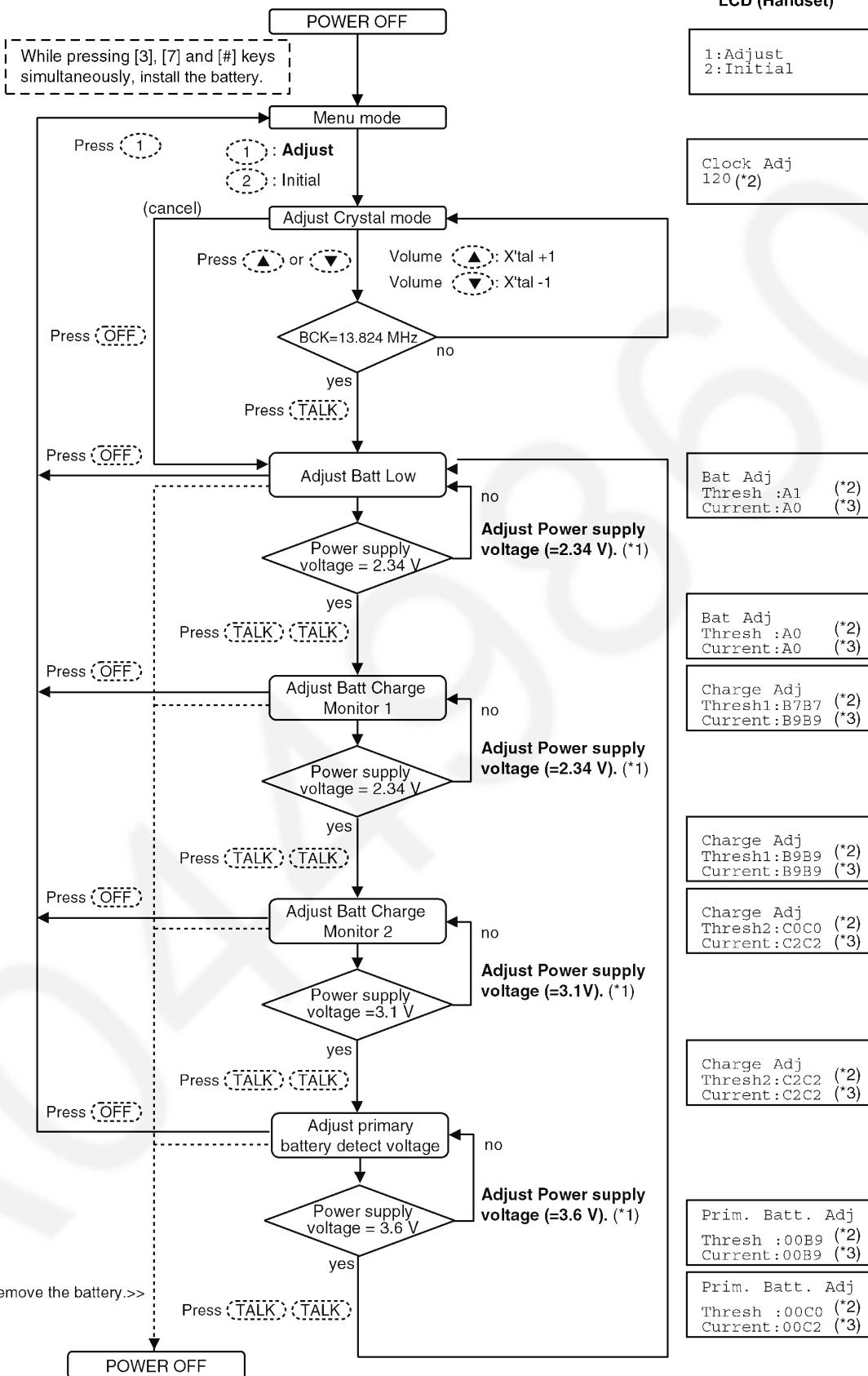
(exception: default/ CH00 = 1ch.)

(*2) Refer to **Check Table for RF part** (P.57).

8.1.9. Test Link Mode for Handset



8.1.10. Adjustment Mode for Handset



Cross Reference

(*1) **Adjust Battery Low Detector Voltage (Handset) (P.71)**

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:

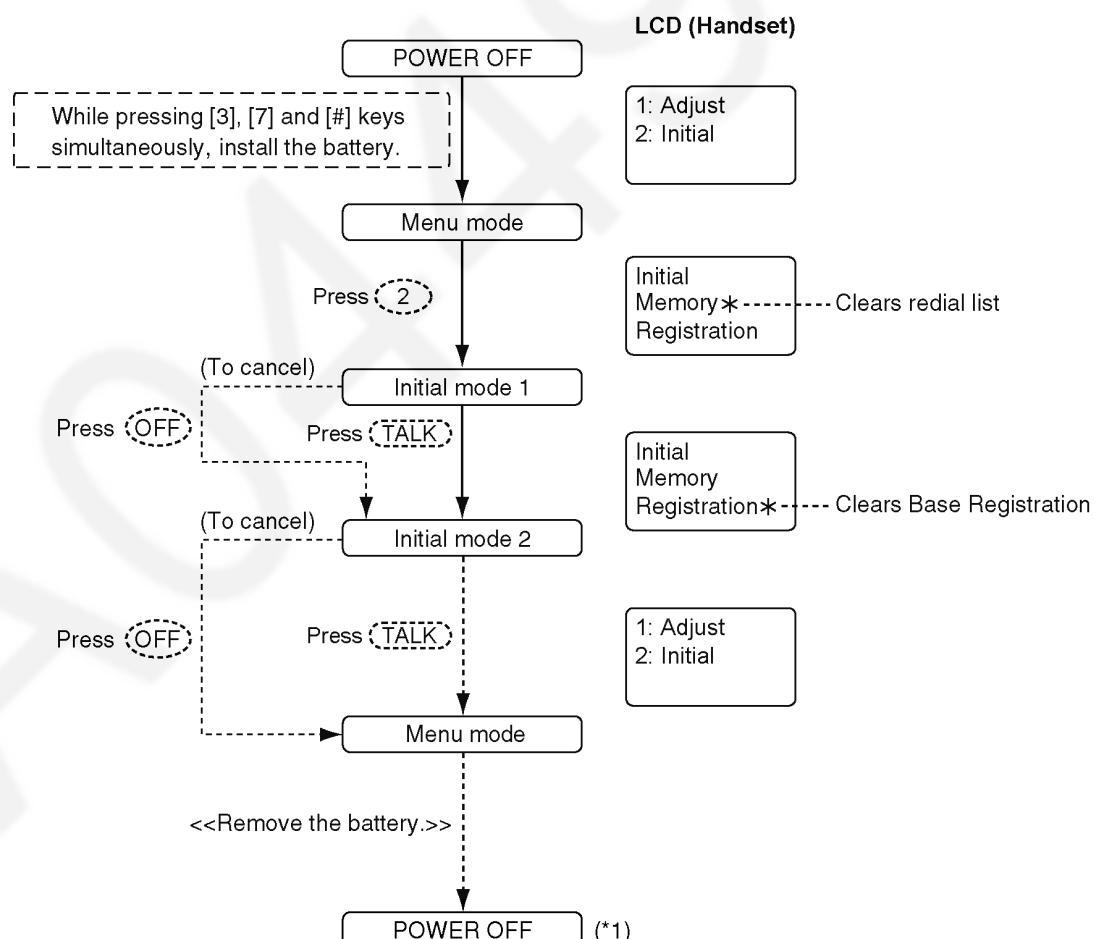
(*1) Refer to **Registering the handset** (P.54).

(*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.55).

(*3) Refer to **Deregistering a Handset** (P.55).

9.1.2. Handset



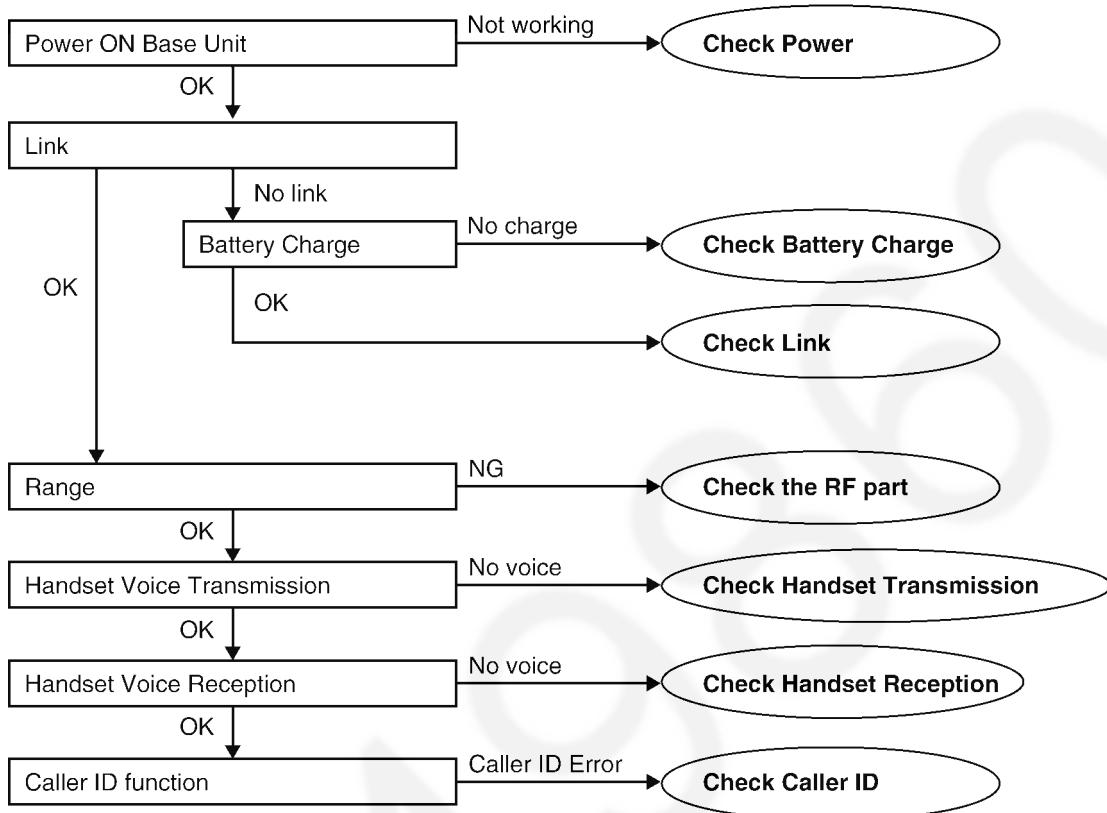
Note:

(*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

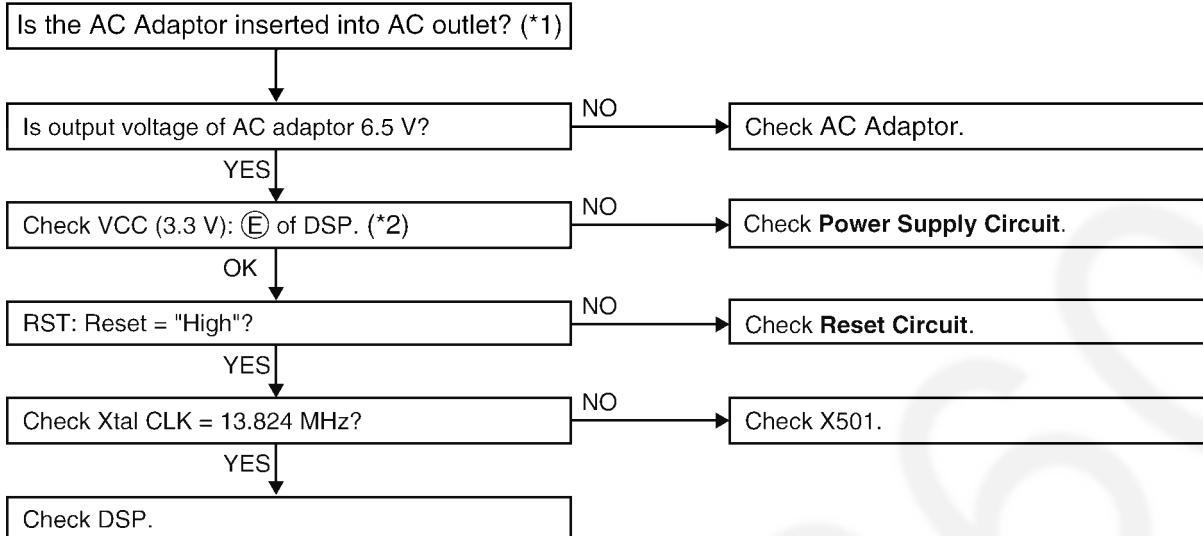


Cross Reference:

- Check Power (P.52)
- Check Battery Charge (P.52)
- Check Link (P.53)
- Check the RF part (P.54)
- Check Handset Transmission (P.61)
- Check Handset Reception (P.61)
- Check Caller ID (P.61)

10.1.1. Check Power

BASE UNIT



Cross Reference:

Power Supply Circuit (P.14)
Reset Circuit (P.16)

Note:

Flash Memory is IC601.

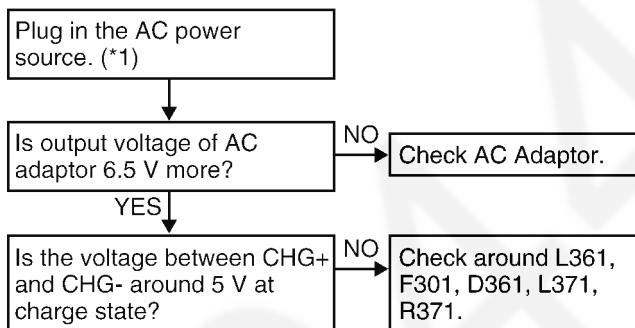
DSP is IC501.

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

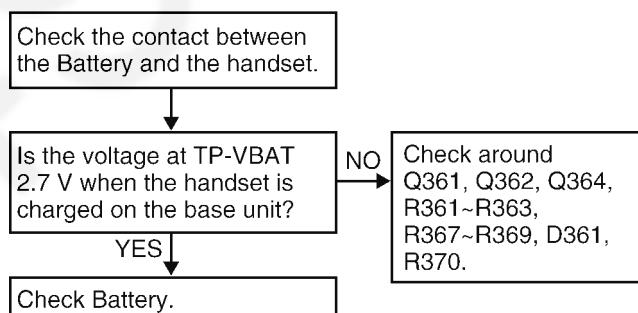
(*2) Refer to **Circuit Board (Base Unit_Main)** (P.93).

10.1.2. Check Battery Charge

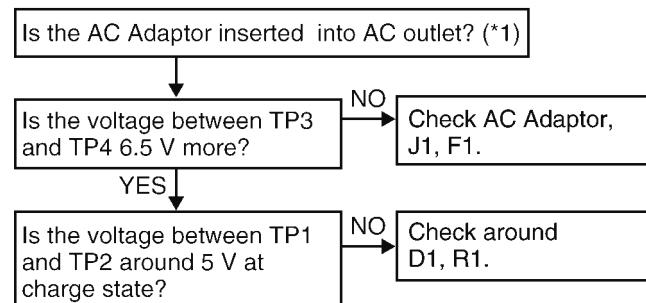
BASE UNIT



HANDSET



CHARGER UNIT

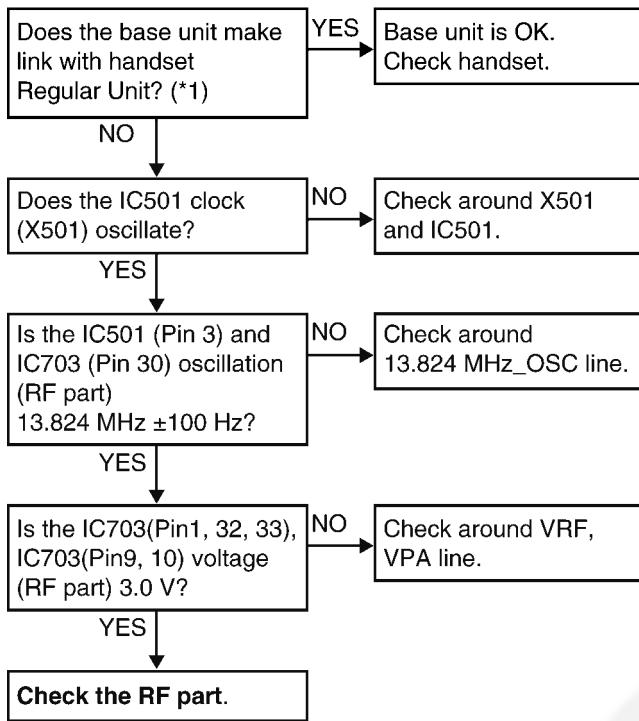


Note:

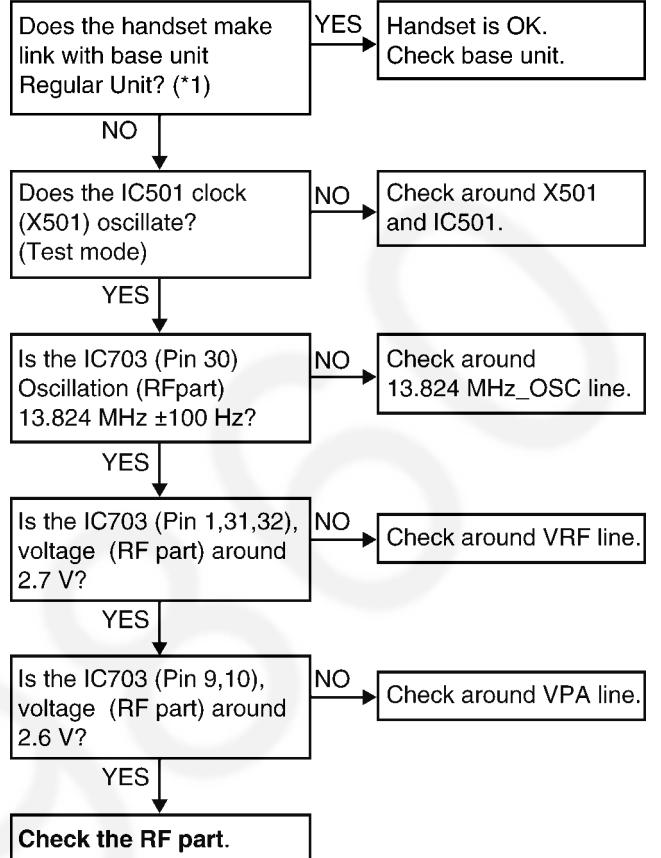
(*1) Refer to **Specifications** (P.6) for part number and supply voltage of AC adaptor.

10.1.3. Check Link

BASE UNIT



HANDSET



Note:

DSP is IC501.

(*1) Refer to **Finding out the Defective part** (P.54).

Cross Reference:
Check the RF part (P.54)

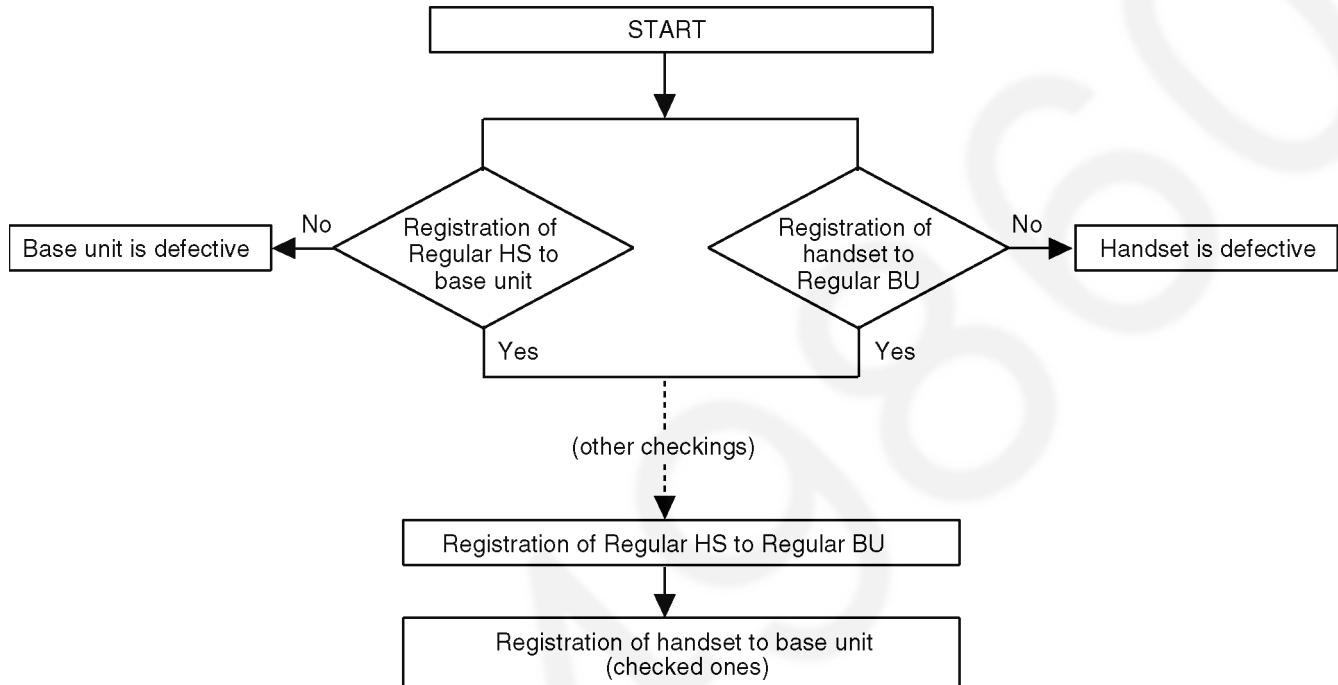
10.1.4. Check the RF part

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 the handset

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

- 1 **Handset:**
[MENU] → [♯][1][3][0]
- 2 **Base unit:**
Press and hold [LOCATOR] for 4 seconds (No registration tone).
 - If all registered handsets start ringing, press the same button to stop. Then repeat this step.
 - The next step should be completed within 90 seconds.
- 3 **Handset:**
Press [OK], then wait until a long beep sounds.
- 4 **[OFF]**

Note:

- While registering, “Base registering” is displayed on all registered handsets.

10.1.4.1.2. Deregistering All Handsets by the Base Unit

Base unit:

- 1 Connect the AC adaptor cord while pressing **[LOCATOR]**.
- 2 Press and hold **[LOCATOR]** again for about 5 seconds.

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. Registering a Handset

Refer to **Registration in Troubleshooting** (P.37)

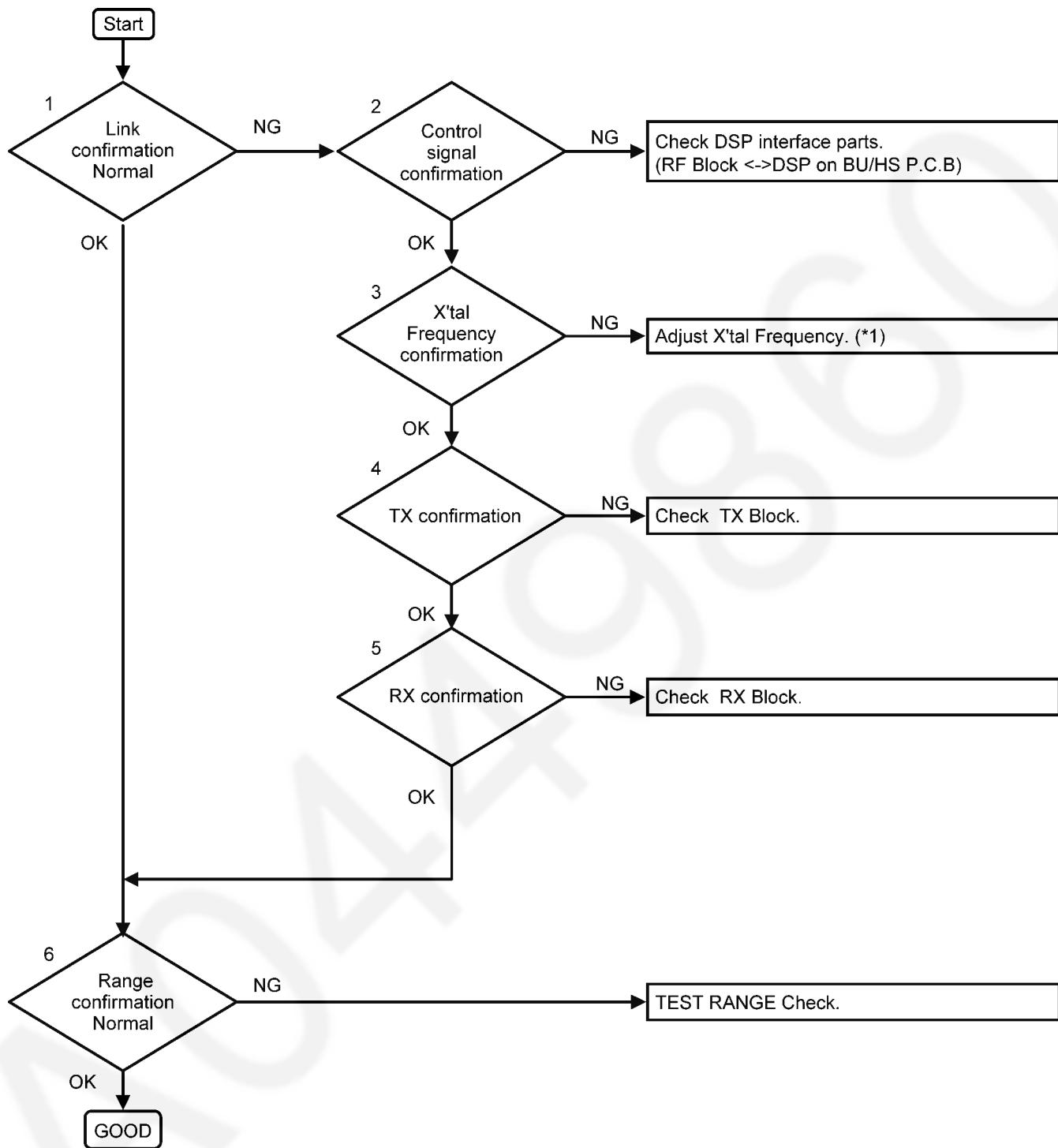
10.1.4.3. Deregistering a Handset

Refer to **Registration in Troubleshooting** (P.37)

10.1.4.4. RF Check Flowchart

Each item (1 ~ 6) of RF Check Flowchart corresponds to **Check Table for RF part** (P.57).

Please refer to the each item.



Note:

(*1) Refer to **X501 (Base Unit), X501 (Handset) Check** (P.71).

10.1.4.5. 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. (*2)
3	X'tal Frequency confirmation (*7) HS, BU Mode: [Adjustment] (*4)	Check X'tal Frequency. (13.824000 MHz ±100 Hz)	Check X'tal Frequency. (13.824000 MHz ±100 Hz)
4	TX confirmation Regular HS (BS) 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 (*7) and "RXDATA" waveform of Regular HS by Digital Oscilloscope.	1. Place Regular BS 15 cm away from a checked HS. 2. Confirm "TXDATA" waveform of HS (*6) and "RXDATA" waveform of Regular BS by Digital Oscilloscope.
5	RX confirmation Regular HS (BS) 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 (*7) and "TXDATA" waveform of Regular HS by Digital Oscilloscope.	1. Place Regular BS 15 cm away from a checked HS 2. Confirm "RXDATA" waveform of HS (*6) and "TXDATA" waveform of Regular BS 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.40)

(*2)(*3) **RF-DSP Interface Signal Wave Form** (P.59)

(*5) **Base Unit Reference Drawing** (P.72)

(*6) **Handset Reference Drawing** (P.74)

(*7) **Things to Do after Replacing IC** (P.71)

10.1.4.6. 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)	1. Register Regular HS to BU (to be checked). 2. Set BU to "Test Link mode". 3. Set Regular HS to "Test Link mode".	1. Register HS (to be checked) to Regular BU. 2. Set Regular BU to "Test Link mode". 3. Set HS to "Test Link mode".
HS, BU Mode: [Test Link Mode] (*1)	*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.	*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)	1. Register Regular HS to BU (to be checked). 2. Set BU to "Test Link mode". 3. Set Regular HS to "Test Link mode".	1. Register HS (to be checked) to Regular BU. 2. Set Regular BU to "Test Link mode". 3. Set HS to "Test Link mode".
HS, BU Mode: [Test Link Mode] (*1)	*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.	* 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

Note:

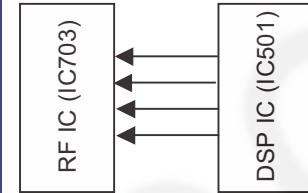
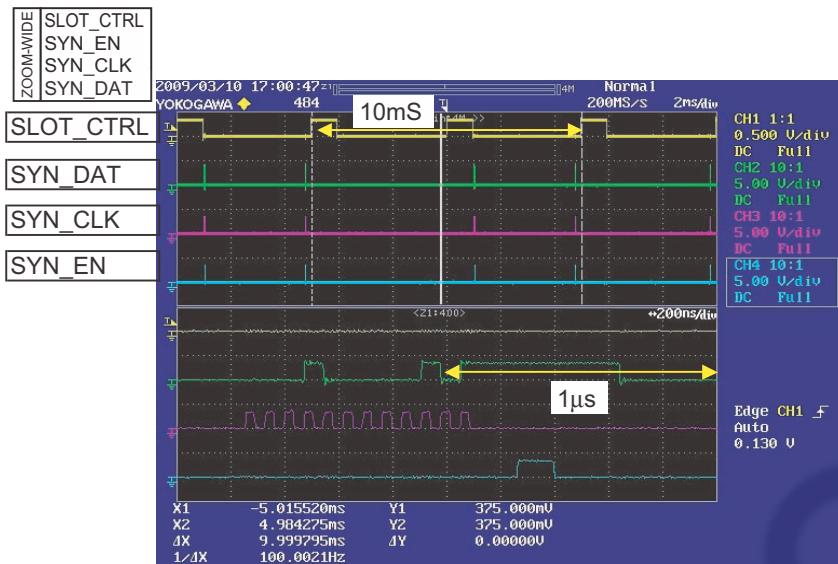
(*1) Adjustment and Test Mode Flow Chart (P.40)

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

10.1.4.7. RF-DSP Interface Signal Wave Form

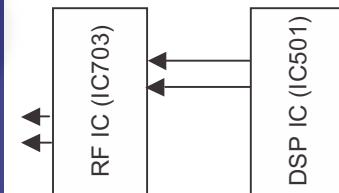
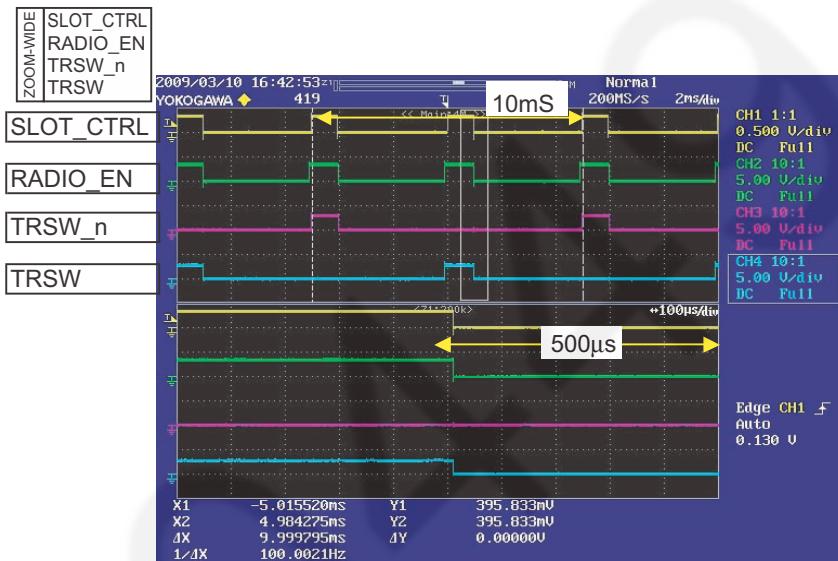
Test Burst Mode

Control signal in TX_Burst mode



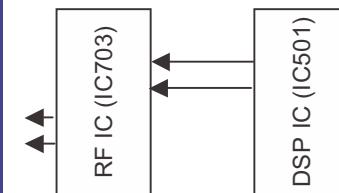
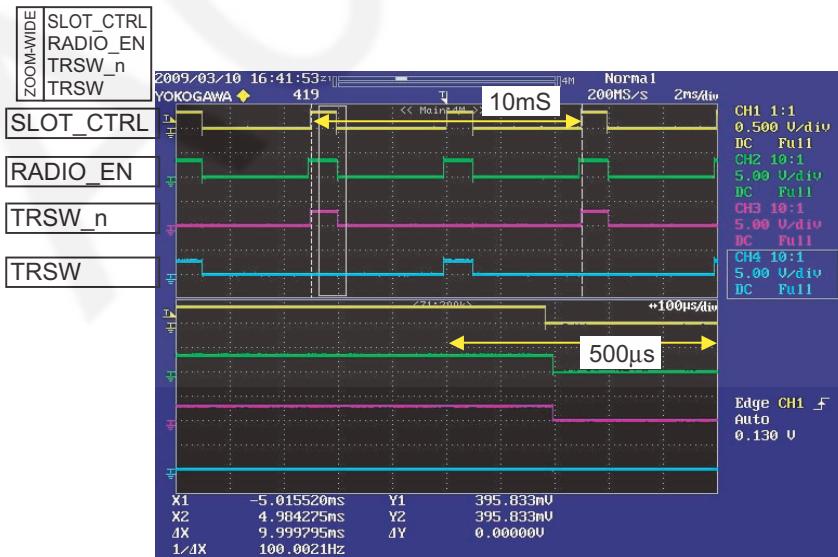
Signal	IC703	IC501	
	BS/HS	BS	HS
SLOT_CTRL	22	19	21
SYN_EN	25	28	30
SYN_CLK	24	29	31
SYN_DAT	23	30	32

TRSW signal of TX zone in TX_Burst mode



Signal	IC703	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



Signal	IC703	IC501	
	BS/HS	BS	HS
SLOT_CTRL	22	19	21
RADIO_EN	21	24	26
TRSW_n	11	-	-
TRSW	6	-	-

Test Burst Mode

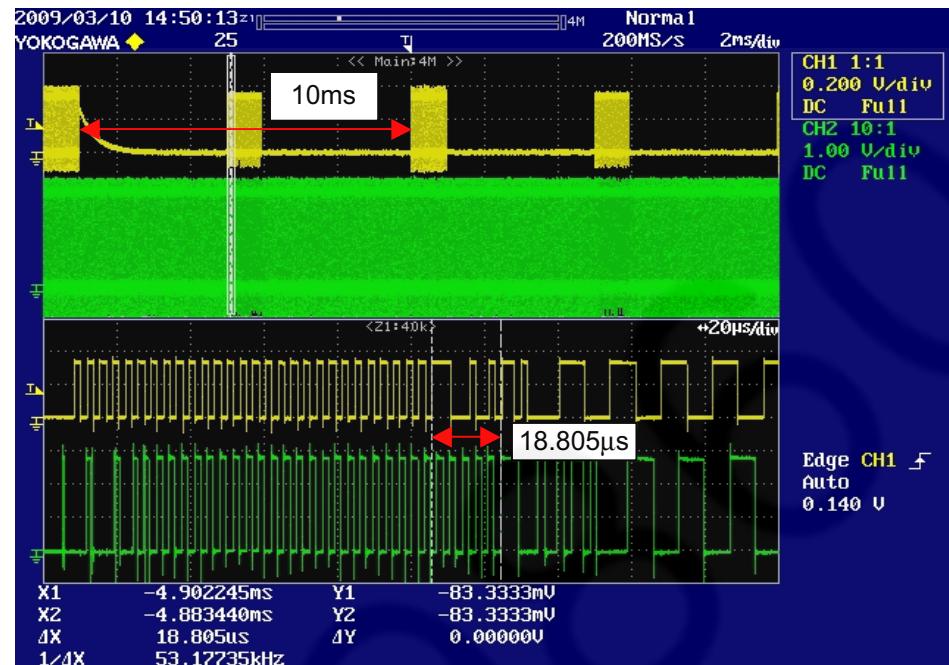
Base Unit TXDATA and Handset RXDATA on TXO signal-line
(TX Confirmation of BS or RX confirmation of HS)

Base Unit TXDATA

Handset RXDATA

Base Unit TXDATA

Handset RXDATA



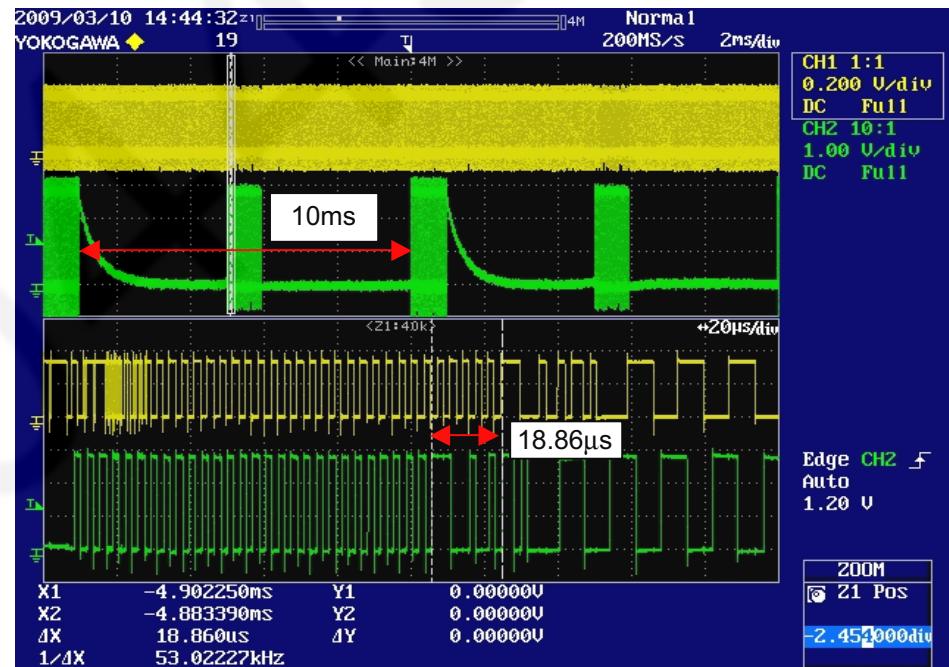
Handset TXDATA and Base unit RXDATA on TXO signal-line
(RX Confirmation of BS or TX confirmation of HS)

Base Unit RXDATA

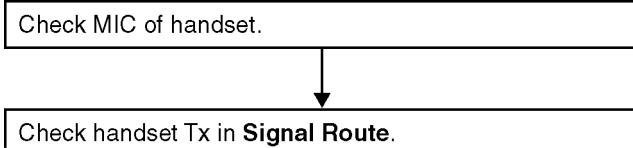
Handset TXDATA

Base Unit RXDATA

Handset TXDATA

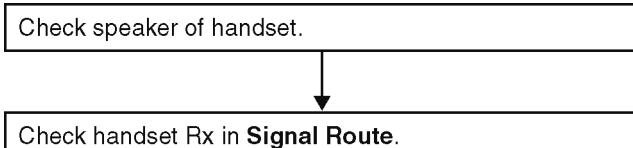


10.1.5. Check Handset Transmission



Cross Reference:
Signal Route (P.30)

10.1.6. Check Handset Reception

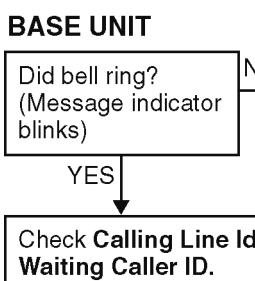


Cross Reference:
Signal Route (P.30)

Note:

When checking the RF part, Refer to **Check the RF part** (P.54).

10.1.7. Check Caller ID



Cross Reference:
Telephone Line Interface (P.17)
Calling Line Identification (Caller ID)/Call Waiting Caller ID (P.20)

Note:

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

10.2. How to Replace the Flat Package IC

10.2.1. Preparation

- PbF (: Pb free) Solder
- Soldering Iron

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

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

- Flux

Recommended Flux: Specific Gravity $\rightarrow 0.82$.

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

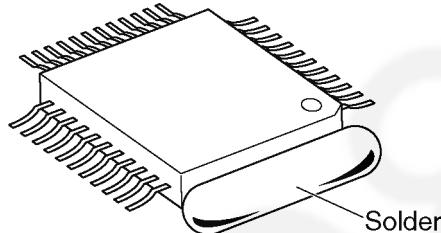
Note: See About Lead Free Solder (PbF: Pb free) (P.4).

10.2.2. How to Remove the IC

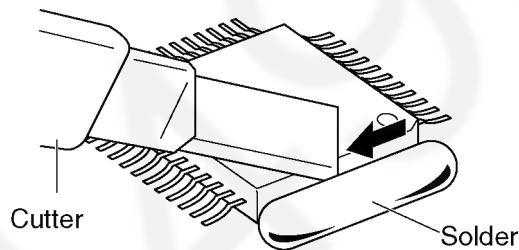
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

Note:

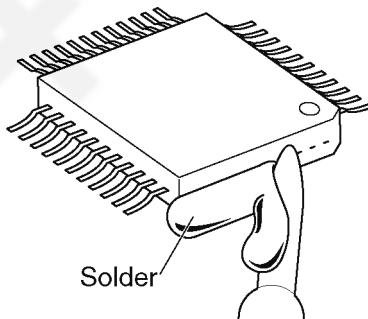
If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



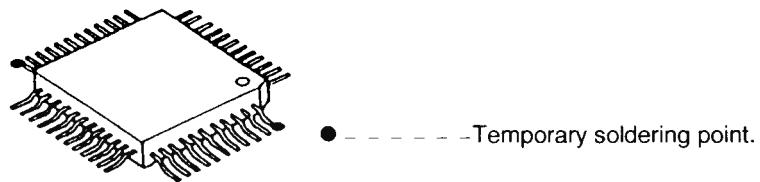
3. While the solder melts, remove it together with the IC pins.



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

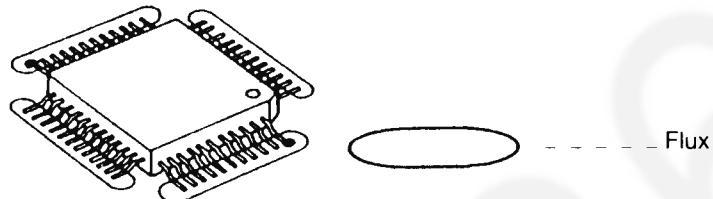
10.2.3. How to Install the IC

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

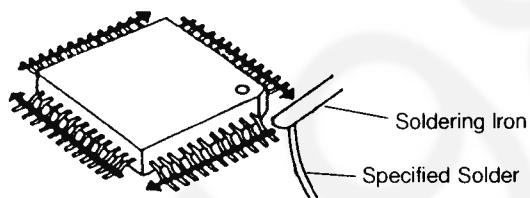


*Check the accuracy of the IC setting with the corresponding soldering foil.

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

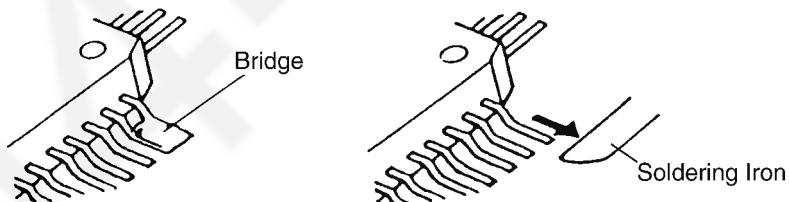


- Solder the pins, sliding the soldering iron in the direction of the arrow.



10.2.4. How to Remove a Solder Bridge

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



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

10.3.1. Preparation

- PbF (: Pb free) Solder
- Soldering Iron

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

Note:

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

- Hot Air Desoldering Tool

Temperature: $608^{\circ}\text{F} \pm 68^{\circ}\text{F}$ ($320^{\circ}\text{C} \pm 20^{\circ}\text{C}$)

10.3.2. Caution

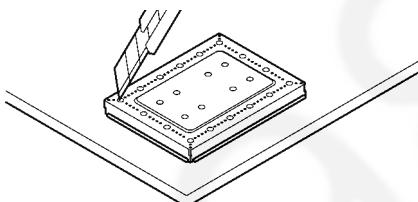
- To replace the IC efficiently, choose the right sized nozzle of the hot air desoldering tool that matches the IC package.
- Be careful about the temperature of the hot air desoldering tool not to damage the PCB and/or IC.

10.3.3. How to Remove the Shield Case

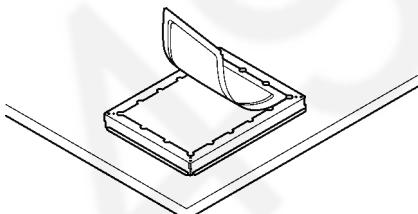
Note:

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

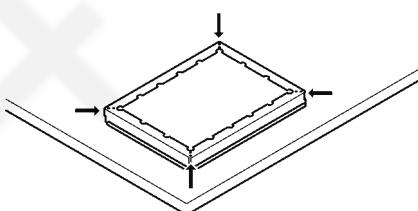
1. Cut the case along perforation.



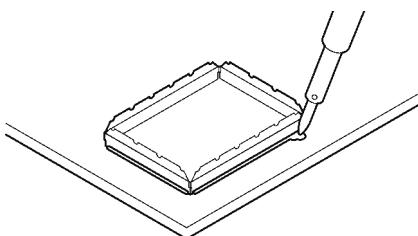
2. Remove the cut part.



3. Cut the four corners along perforation.



4. Remove the reminds by melting solder.

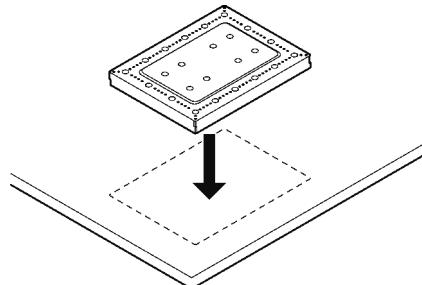


10.3.4. How to Install the Shield Case

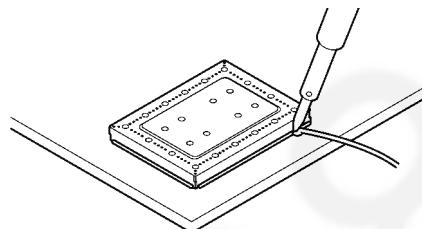
Note:

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

1. Put the shield case.

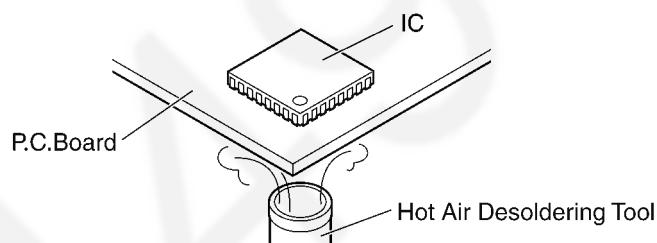


2. Solder the surroundings.



10.3.5. How to Remove the IC

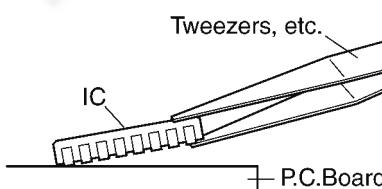
1. Heat the IC with a hot air desoldering tool through the P.C.Board.



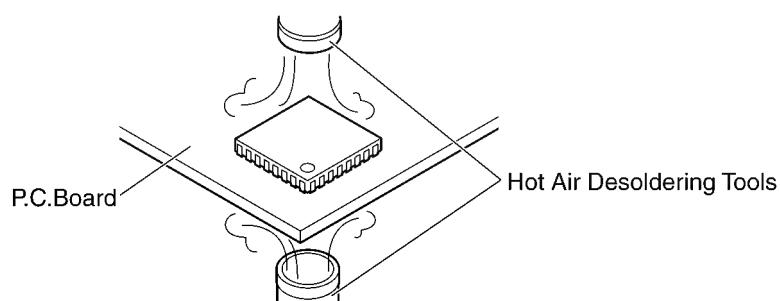
2. Pick up the IC with tweezers, etc. when the solder is melted completely.

Note:

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



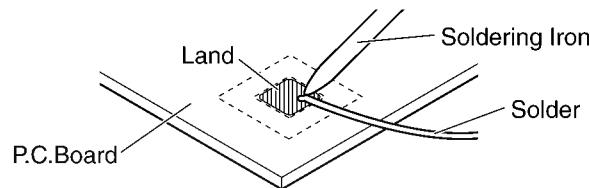
When it is hard to melt the solder completely, heat it with a hot air desoldering tool through the IC besides through the P.C.Board.



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

10.3.6. How to Install the IC

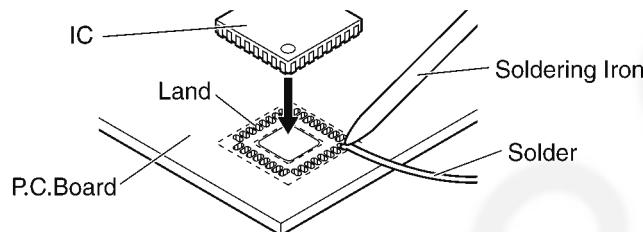
1. Place the solder a little on the land where the radiation GND pad on IC bottom is to be attached.



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

Note:

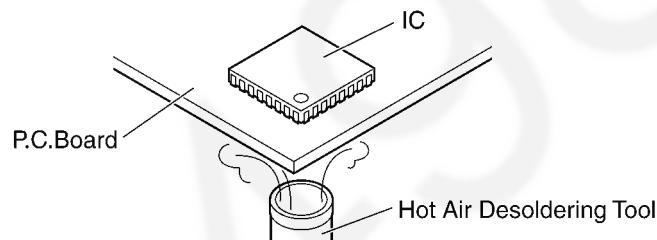
- When placing the IC, the positioning should be done very carefully.



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

Note:

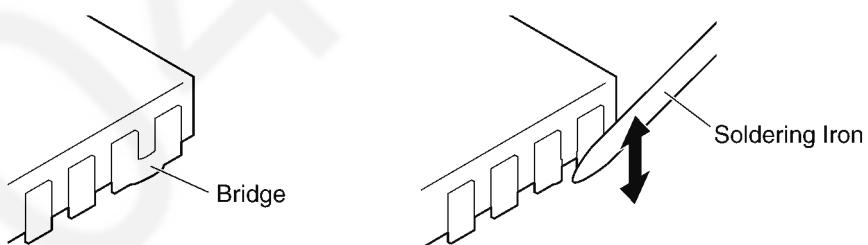
- Be sure to place it precisely, controlling the air volume of the hot air desoldering tool.



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

10.3.7. 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.

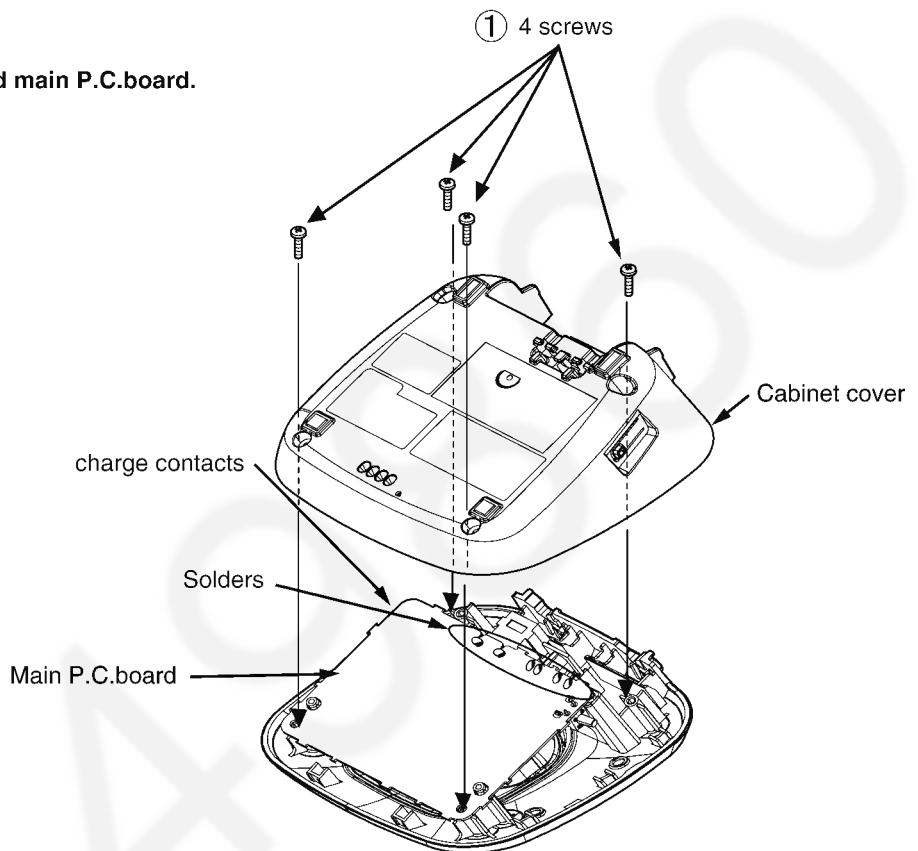


11 Disassembly and Assembly Instructions

11.1. Disassembly Instructions

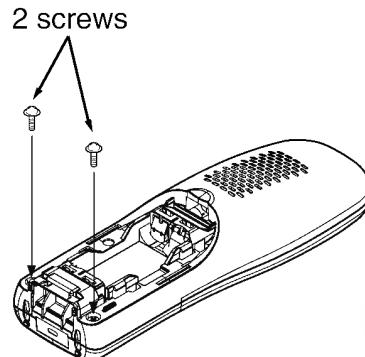
11.1.1. Base Unit

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

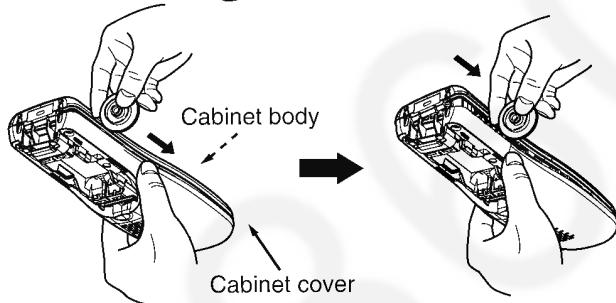


11.1.2. Handset

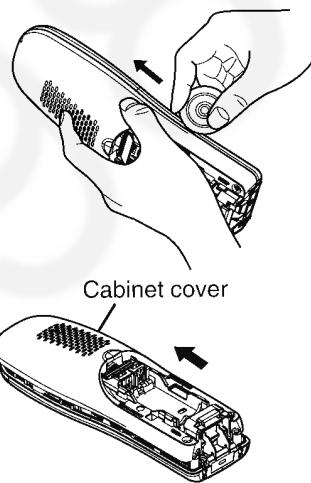
① Remove the 2 screws.



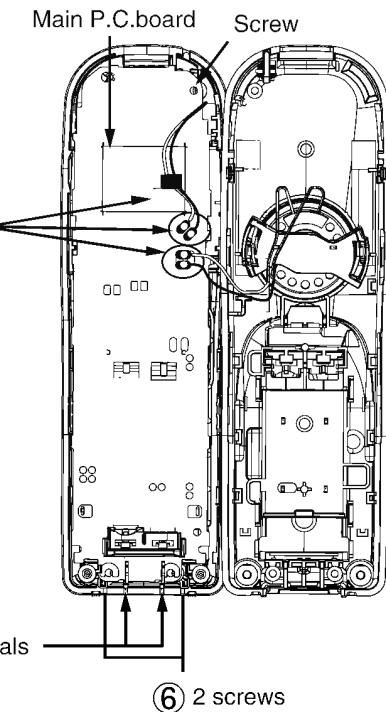
② Insert a JIG (PQDJ10006Y) between the cabinet body and the cabinet cover, then pull it along the gap to open the cabinet.



③ Likewise, open the other side of the cabinet.



④ Remove the cabinet cover by pushing it upward.



⑤ Remove the tape and solders.

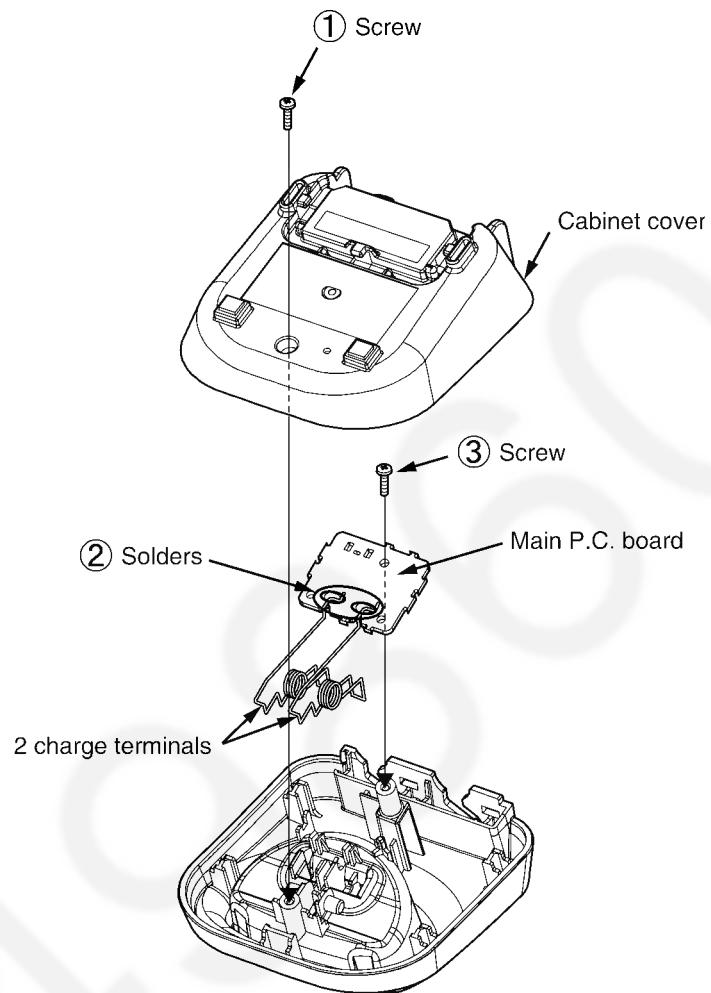
⑤ Tape and solders

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

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

11.1.3. Charger Unit

① Remove the screw to remove the cabinet cover.

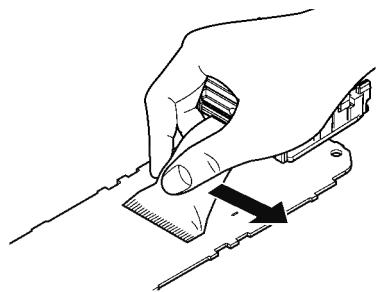


② Remove the solders to remove the 2 charge terminals.

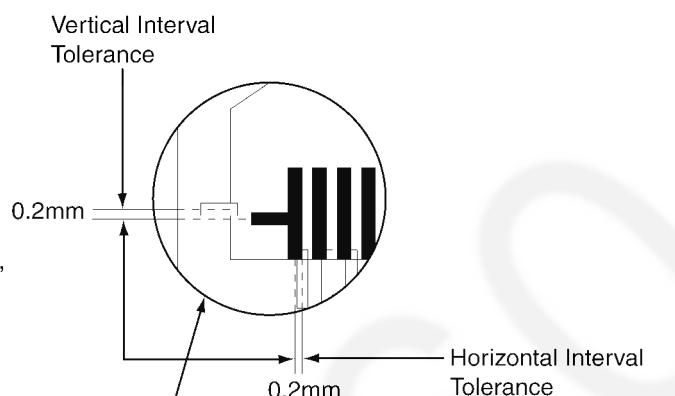
③ Remove the screw to remove the main P.C. board.

11.2. How to Replace the Handset LCD

①

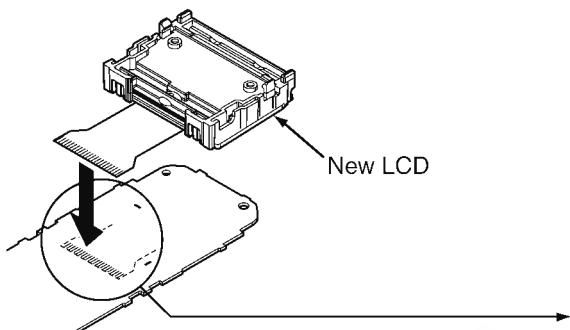


Peel off the FFC (Flexible Flat Cable) from the LCD, in the direction of the arrow. Take care to ensure that the foil on the P.C. board is not damaged.



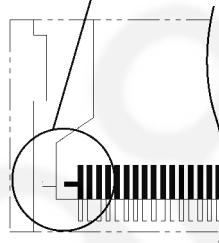
If interval tolerance between center lines is less than 0.2mm, it is o.k.

②

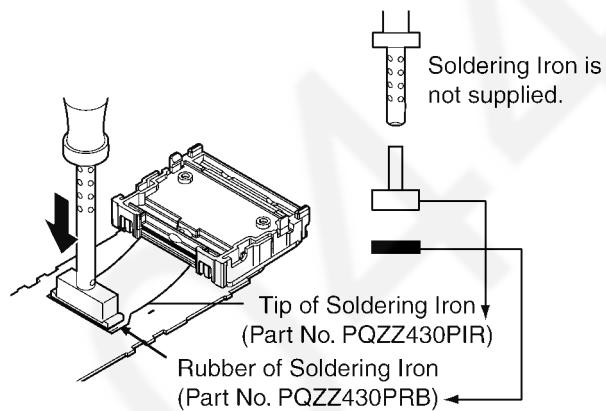


Fit the heatseal of a new LCD.

OK



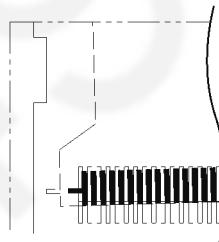
③



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

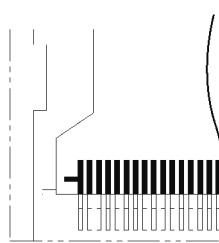
NG

(Inclined)



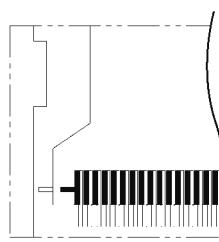
NG

(Vertical interval tolerance is more than 0.2mm.)



NG

(Horizontal interval tolerance is more than 0.2mm.)



12 Measurements and Adjustments

12.1. Things to Do after Replacing IC

12.1.1. X501 (Base Unit), X501 (Handset) Check

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)

12.1.1.1. Check and Adjust X501 (Base Unit) Frequency

Personal Computer(PC) and the UART cable are necessary for the following operation.(*1)

1. Connect the UART cable to the base unit(*1) and the PC. Connect the AC adaptor cord to the base unit.
2. Start up the terminal software in the PC(*2), and adjust Crystal parameter by using "nc" command in the terminal software window. (*1)
3. Enter "z" to fix last "nc" parameter.
4. Disconnect the AC adaptor cord.

Note:

(*1) Refer to **How to make a U-ART Jig (Base Unit)** (P.76), **Adjustment Mode for Base Unit** (P.44)

(*2) It is necessary to setup this software beforehand. Refer to **How to make a U-ART Jig (Base Unit)** (P.76)

When you have replaced IC501 and IC541, adjust X501 by the procedure above.

Cross Reference:

Adjustment Mode for Base Unit (P.44)

Refer to **How to make a U-ART Jig (Base Unit)** (P.76)

12.1.1.2. Check and Adjust X501 (Handset) Frequency

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 [Δ] or [∇] key.
5. Press [TALK] key to write the new frequency factor in EEPROM.
6. Turn the power off. Then this value is available.

When you have replaced IC501 and IC541, adjust X501 by the procedure above.

Cross Reference:

Adjustment Mode for Handset (P.49)

12.1.2. 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 3.6V 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.74) for connection of DC power supply and voltmeter.

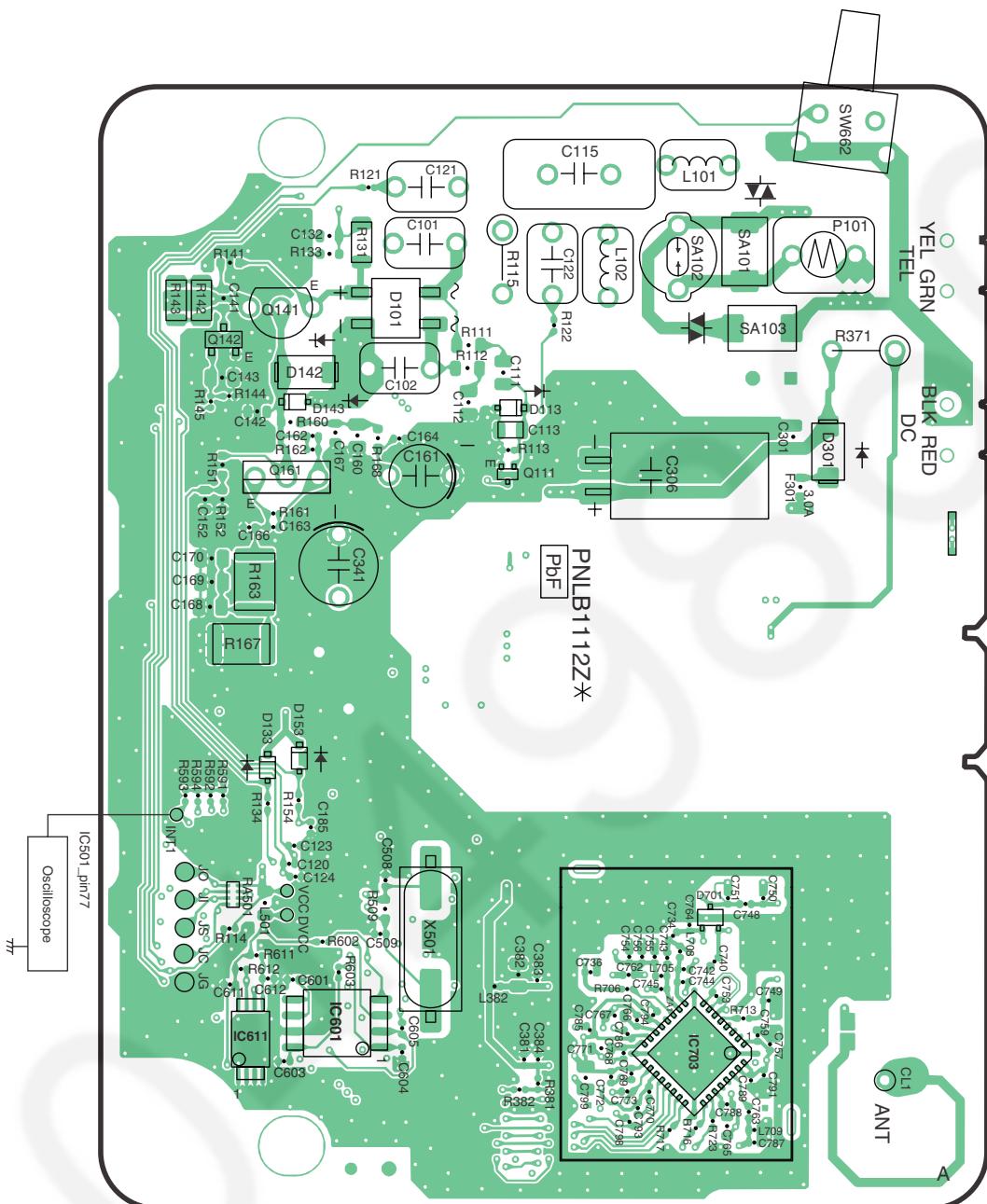
Cross Reference:

Adjustment Mode for Handset (P.49)

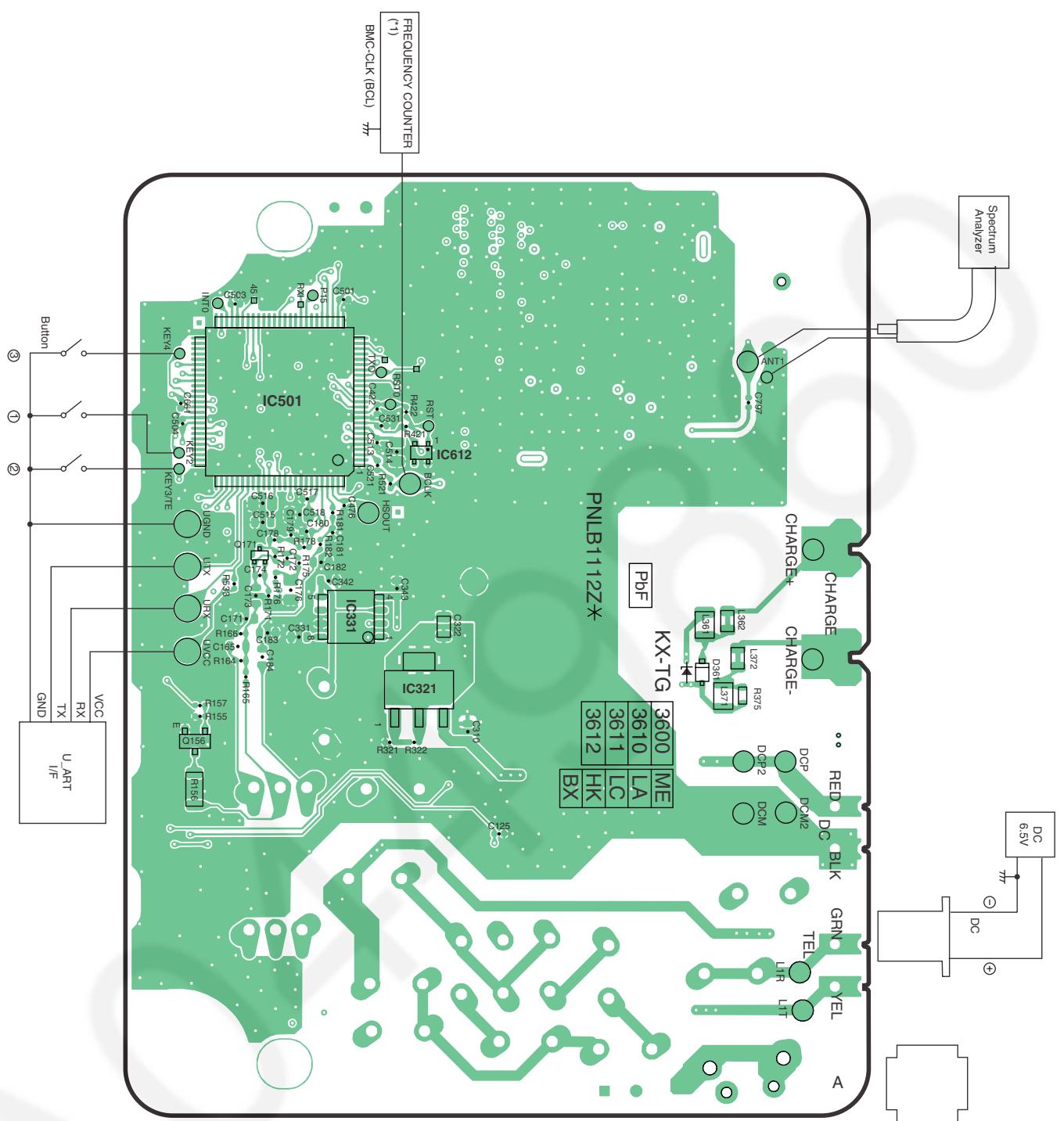
12.2. Base Unit Reference Drawing

12.2.1. Component View

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

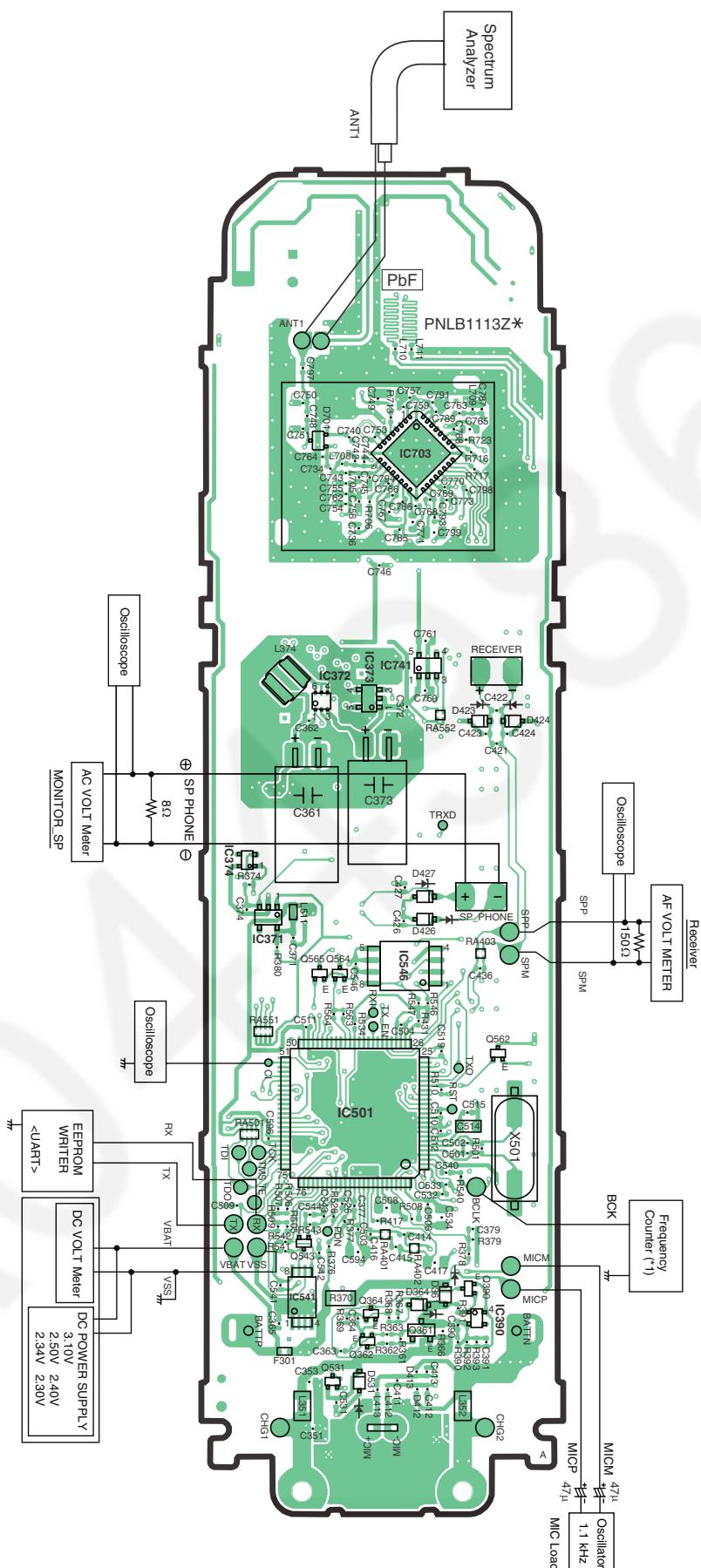


12.2.2. Bottom View



12.3. Handset 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.57).

12.4. Frequency Table

Channel	Ch. (hex)	Frequency (MHz)	Channel	Ch. (hex)	Frequency (MHz)	Channel	Ch. (hex)	Frequency (MHz)
1	01	2402.784	37	25	2433.888	73	49	2464.992
2	02	2403.648	38	26	2434.752	74	4A	2465.856
3	03	2404.512	39	27	2435.616	75	4B	2466.72
4	04	2405.376	40	28	2436.48	76	4C	2467.584
5	05	2406.240	41	29	2437.344	77	4D	2468.448
6	06	2407.104	42	2A	2438.208	78	4E	2469.312
7	07	2407.968	43	2B	2439.072	79	4F	2470.176
8	08	2408.832	44	2C	2439.936	80	50	2471.04
9	09	2409.696	45	2D	2440.8	81	51	2471.904
10	0A	2410.56	46	2E	2441.664	82	52	2472.768
11	0B	2411.424	47	2F	2442.528	83	53	2473.632
12	0C	2412.288	48	30	2443.392	84	54	2474.496
13	0D	2413.152	49	31	2444.256	85	55	2475.36
14	0E	2414.016	50	32	2445.12	86	56	2476.224
15	0F	2414.88	51	33	2445.984	87	57	2477.088
16	10	2415.744	52	34	2446.848	88	58	2477.952
17	11	2416.608	53	35	2447.712	89	59	2478.816
18	12	2417.472	54	36	2448.576	90	5A	2479.68
19	13	2418.336	55	37	2449.44			
20	14	2419.2	56	38	2450.304			
21	15	2420.064	57	39	2451.168			
22	16	2420.928	58	3A	2452.032			
23	17	2421.792	59	3B	2452.896			
24	18	2422.656	60	3C	2453.76			
25	19	2423.52	61	3D	2454.624			
26	1A	2424.384	62	3E	2455.488			
27	1B	2425.248	63	3F	2456.352			
28	1C	2426.112	64	40	2457.216			
29	1D	2426.976	65	41	2458.08			
30	1E	2427.84	66	42	2458.944			
31	1F	2428.704	67	43	2459.808			
32	20	2429.568	68	44	2460.672			
33	21	2430.432	69	45	2461.536			
34	22	2431.296	70	46	2462.4			
35	23	2432.16	71	47	2463.264			
36	24	2433.024	72	48	2464.128			

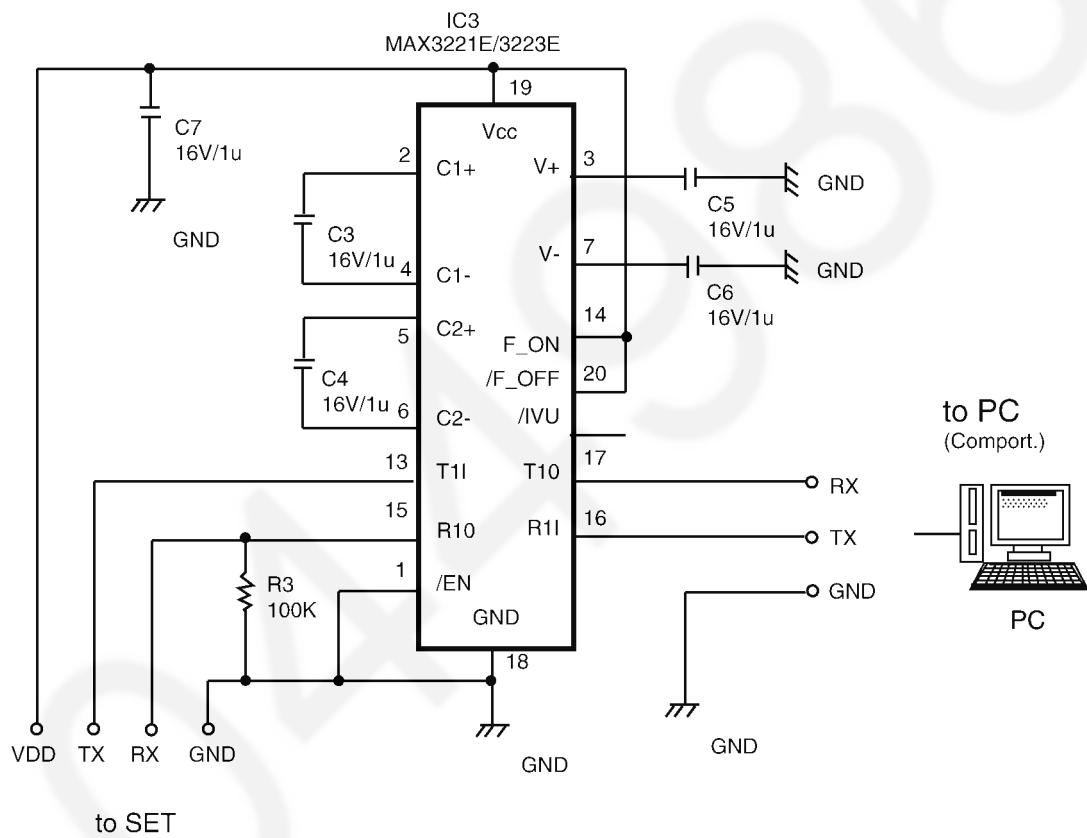
12.5. How to make a U-ART Jig (Base Unit)

1. Preparation

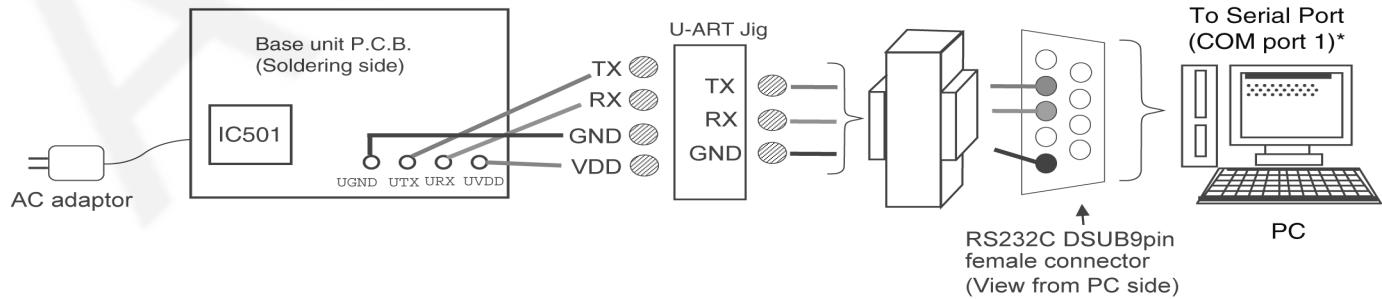
Ref No.	Part No.	Note
Parts		
IC3	MAX3223E	3V.RS-232C Tranceiver
C3	Capacitor	1u/16V
C4	Capacitor	1u/16V
C5	Capacitor	1u/16V
C6	Capacitor	1u/16V
C7	Capacitor	1u/16V
R3	100K	
PCB	Universal PCB	

IC detail:refer to MAXIM Web Site

- Solder all parts to P.C.B.



12.6. U-ART Jig Connection



Note:

Connect the AC adaptor to the Base Unit, which supplies the electricity to the power source (VDD) of U-ART Jig.

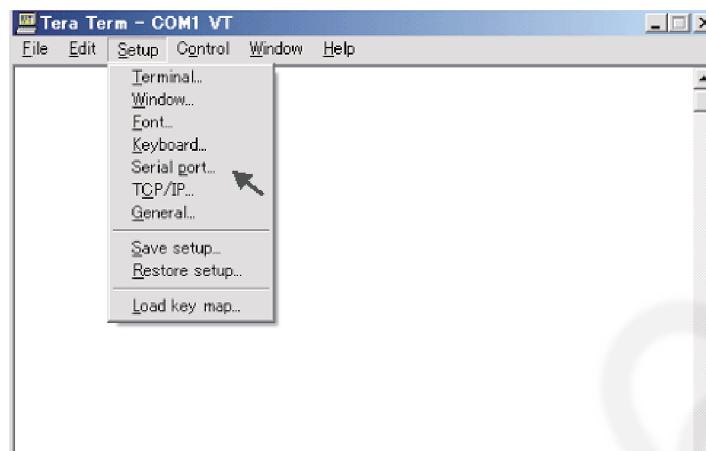
*: COM port names may vary depending on what your PC calls it.

12.7. Test Mode (Base Unit)

PC Setting

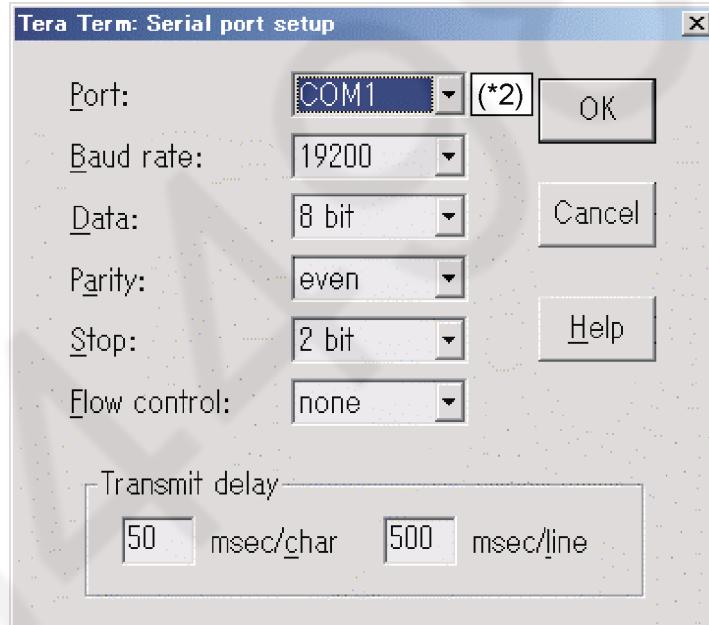
Preparation:

1. Select "Serial port" from the "Setup" menu (*1).



2. Enter the information as shown in the following figure.
3. Click the [OK] button.
4. Select "Save setup" from the "Setup" menu.

Specify "TTERMPRO" folder and overwrite "TERATERM.INI" (*3).



Note:

(*1) Install "Teratermpro.exe" from the web site.

For more details on how to install, refer to the web site.

(*2) Confirm Port # on your PC setting; it varies from PC to PC.

(*3) Once you install and save the file, it is not necessary to do it again.

13 Miscellaneous

13.1. CPU Data (Base Unit)

13.1.1. IC501

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

Pin	Discription	I/O	High	High_Z	Low
60	NC	D.O	--	--	--
61	NC	D.O	--	--	--
62	KEY_IN4	D.I	Non	--	Key In
63	KEY_IN3	D.I	Non	--	Key In
64	KEY_IN2	D.I	Non	--	Key In
65	KEY_IN1	D.I	Non	--	Key In
66	GND	GND	--	--	GND
67	VCC	VCC	VCC	--	--
68	TCK	D.O	--	--	--
69	TMS	D.I	--	--	--
70	TDI	D.O	--	--	--
71	TD0	D.O	--	--	--
72	NC	D.O	--	--	--
73	NC	D.O	--	--	--
74	NC	D.O	--	--	--
75	NC	D.O	--	--	--
76	NC	D.O	--	--	--
77	NC(INT1)	D.O	--	--	--
78	NC	D.O	--	--	--
79	NC	D.O	--	--	--
80	NC	D.O	--	--	--
81	UART_TX	D.O	High	--	Low
82	UART_RX	D.I	High	--	Low
83	NC	D.O	--	--	--
84	GND	GND	--	--	GND
85	PDN	A.I	--	--	--
86	DCIN1	A.I	--	--	--
87	VREF	A.O	--	--	--
88	MIP	A.I	--	--	--
89	MIN	A.I	--	--	--
90	DCIN2	A.I	--	--	--
91			--	--	--
92	GNDA	GND	--	--	--
93			--	--	--
94			--	--	--
95	VCCA	VCC	--	--	--
96	LIN0	A.I	--	--	--
97	LOUT0	A.O	--	--	--
98	NC	A.O	--	--	--
99	VCCPA	VCC	--	--	--
100	NC	A.O	--	--	--

Note:

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

13.2. CPU Data (Handset)

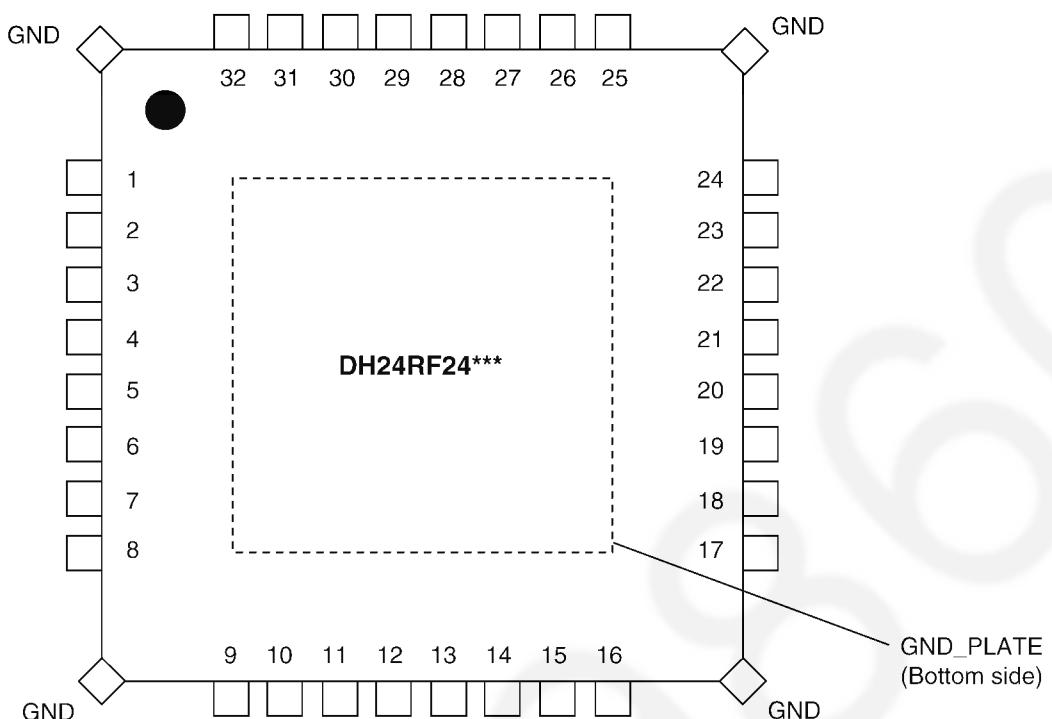
13.2.1. IC501

Pin	Description	I/O	High	High_Z	Low
1	GNDPA	GND	--	--	GND
2	SPOUTP	A.O	--	--	--
3	BCLK	A.O	--	--	--
4	NC	A.I	--	--	--
5	XIN	A.I	--	--	--
6	XOUT	A.O	--	--	--
7	VDD	VDD	--	--	--
8	VCC	VCC	--	--	--
9	GND	GND	--	--	GND
10	GND	GND	--	--	GND
11	GND	A.I	--	--	--
12	GND	A.O	--	--	--
13	RESET	D.I	Normal	--	Reset
14	(FLASH_RESET)	D.O	--	--	Normal
15	(FLASH_SO)	D.O	--	--	Normal
16	(FLASH_SI)	D.O	High	--	Low
17	(FLASH_CS)	D.O	--	--	Normal
18	NC	D.O	--	--	--
19	SYN_OUT	D.I	High	--	Low
20	TX_DATA	D.O	High	--	Low
21	SLOT_CTRL	D.O	High	--	Low
22	LCD_KEY_BL LED	D.O	on	--	off
23	RF_POWER	D.O	High	--	Low
24	NC	D.O	--	--	--
25	RF_RESET	D.O	On	--	Off
26	RADIO_EN	D.O	On	--	Off
27	NC	D.O	--	--	--
28	GND	GND	--	--	GND
29	VCC	VCC	VCC	--	--
30	SYN_EN	D.O	High	--	Low
31	SYN_CLK	D.O	High	--	Low
32	SYN_DATA	D.O	High	--	Low
33	NC	D.O	--	--	--
34	TXEN	D.O	Active	--	Off
35	NC	D.O	--	--	--
36	RX_DATA	D.I	--	--	--
37	NC	D.I	--	--	--
38	CHARGE_DET	D.I	Off Charge	--	On Charge
39	NC	D.O	--	--	--
40	TALK LED(NO LCD)	D.O	--	--	--
41	NC	D.O	--	--	--
42	CHARGE_CNT	D.O	Trickle	Normal	--
43	NC	D.O	--	--	--
44	DOT_LCD_D4	D.O	High	--	Low
45	DOT_LCD_D5	D.O	High	--	Low
46	DOT_LCD_D6	D.O	High	--	Low
47	DOT_LCD_D7	D.O	High	--	Low
48	GND	GND	--	--	GND
49	VCC	VCC	VCC	--	--
50	DOT_LCD_RESET	D.O	Normal	--	Reset
51	(FLASH_SCK)	D.O	High	--	Low
52	CI(Start-up Monitor)	D.O	--	--	Normal
53	NC	D.O	--	--	--
54	NC	D.O	--	--	--
55	ANT_LED1	D.O	on	--	off
56	DOT_LCD_RS	D.O	Data	--	Instruct
57	DOT_LCD_RW_WR	D.O	Read	--	Write
58	DOT_LCD_E_RD	D.O	Active	--	Not
59	DOT_LCD_POWER_SW	D.O	on	--	off
60	NC	D.O	--	--	--
61	NC	D.O	--	--	--

Pin	Description	I/O	High	High_Z	Low
62	NC	D.O	--	--	--
63	KEYSTROBE_E	D.O	--	Not	Active
64	KEYSTROBE_D	D.O	--	Not	Active
65	KEYSTROBE_C	D.O	--	Not	Active
66	KEYSTROBE_B	D.O	--	Not	Active
67	KEYSTROBE_A	D.O	--	Not	Active
68	GND	GND	--	--	GND
69	VCC	VCC	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	KEYIN1	D.I	Non	--	Key In
75	KEYIN2	D.I	Non	--	Key In
76	KEYIN3	D.I	Non	--	Key In
77	KEYIN4	D.I	Non	--	Key In
78	KEYIN5	D.I	Non	--	Key In
79	FB1	D.O	--	--	Normal
80	FB2	D.O	--	--	Normal
81	EEPROM_CLK	D.O	High	--	Low
82	EEPROM_DATA	D.I.O	--	High	Low
83	UART_TX	D.O	High	--	Low
84	UART_RX	D.I	High	--	Low
85	EEPROM_WP	D.O	WP	--	Write
86	GND	GND	--	--	GND
87	PDN	A.I	--	--	--
88	Battlow	A.I	--	--	--
89	VREF	A.O	--	--	--
90	MIP	A.I	--	--	--
91	MIN	A.I	--	--	--
92	MICBIAS	A.I	--	--	--
93	GNDA	GND	--	--	GND
94	VCCA	VCC	VCC	--	--
95	LIN0	A.I	--	--	--
96	IBAT2	A.I	--	--	--
97	SPP1	A.O	--	--	--
98	SPN	A.O	--	--	--
99	VCCPA	VCC	VCC	--	--
100	SPPN	A.O	--	--	--

13.3. Explanation of IC Terminals (RF Part)

13.3.1. IC703

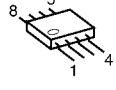
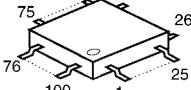
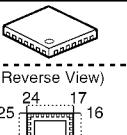
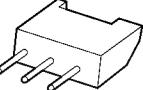
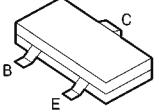
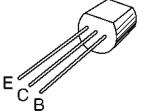
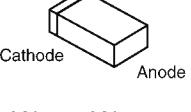
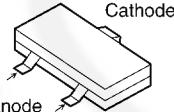


Pin	Description	I/O
1	VCC_VCO	VCC
2	ATST_p	O
3	ATST_n	O
4	ANT_N	O
5	TRSW	O
6	GND	GND
7	Rxp	I
8	Rxn	I
9	TX_p	O
10	TX_n	O
11	TRSW_n	O
12	ANT	O
13	VCC_FE	VCC
14	VDD_IF	VCC
15	VCC_IF	VCC
16	VDD_DIG_b	VCC
17	VCC_DIG	VCC

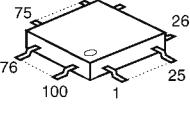
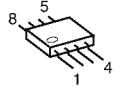
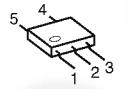
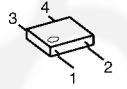
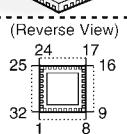
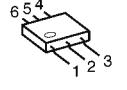
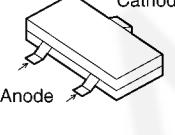
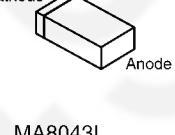
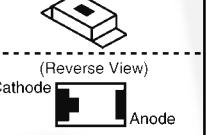
Pin	Description	I/O
18	RSTN	I
19	VCC_IO	VCC
20	TR_DATA	I/O
21	RADIOEN	I
22	SLOT_CTRL	I
23	SYN_DAT	I
24	SYN_CLK	I
25	SYN_EN	I
26	SYN_OUT	O
27	VDD_DIG_t	VCC
28	DTEST	O
29	DTST1	O
30	REF_IN	I
31	VCC_DIV	VCC
32	VCC_PLL	VCC
	GND_PLATE	GND

13.4. Terminal Guide of the ICs, Transistors and Diodes

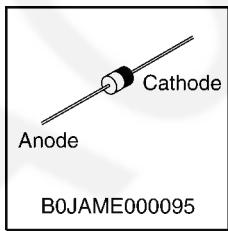
13.4.1. Base Unit

 PNWIG3611BXH PNWIG3612BXH C0DBFGD00017	 C2HBBY000111	 (Reverse View) C1CB00003094	 C0CBAYG00016	 2SD1994A
 2SC6054JSL PQVTBF822T7	 B1ACGP000008	 Cathode Anode MA111, MA8220 B0JCME000035 MANV250GEL	 PQVDM5S	 Cathode Anode B0DDCD000001

13.4.2. Handset

 C2HBBY000109	 PNWIGA361BXR	 C0CBCAC00252 C0DBAYY00067 C0DBGYY00297	 C0EBD0000355 PQVIC61CN45N	 (Reverse View) C1CB00003094
 MTM767200LBF	 B0DDCD000001	 Cathode Anode MA8043L MA2ZDO200L	 B1ADGE000004, 2SC6054JSL UNR92AVJ0L, UNR921EJ0L, UNR9215J0L	
 (Reverse View) Cathode Anode B3ACB0000216				

13.4.3. Charger



Memo

AO449860

14 Schematic Diagram

14.1. For Schematic Diagram

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

14.1.1.1. Acoustiv Testing Mode

① Put the following command from UART on the base unit.

ts ↲
pd ↲

② Press [Talk] key of the handset.

It is easier to measure the transmit level with acoustic testing mode.

Notes:

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

Important Safety Notice:

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

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

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:

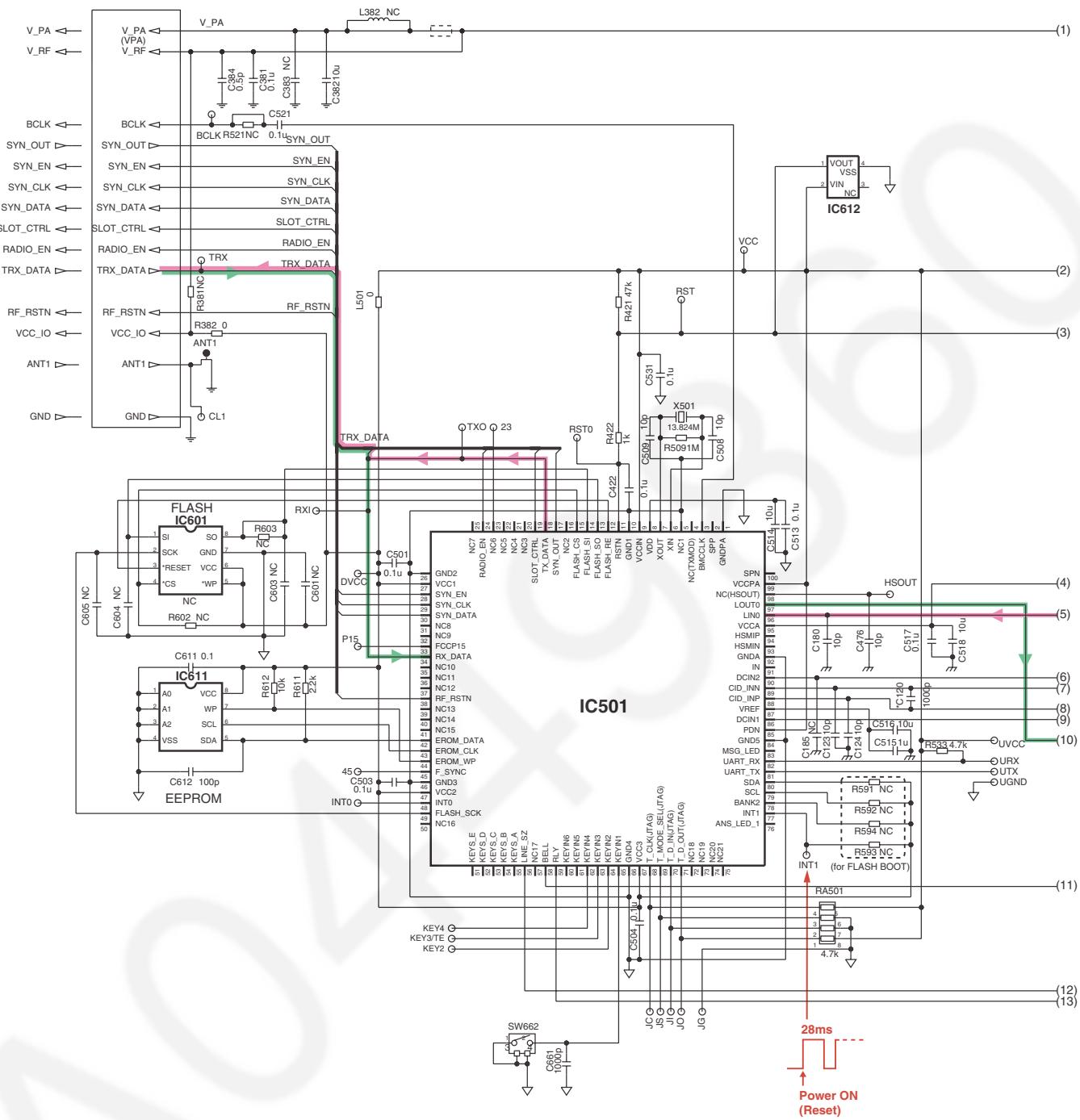
1. DC voltage measurements are taken with voltmeter from the negative voltage line.

Important Safety Notice:

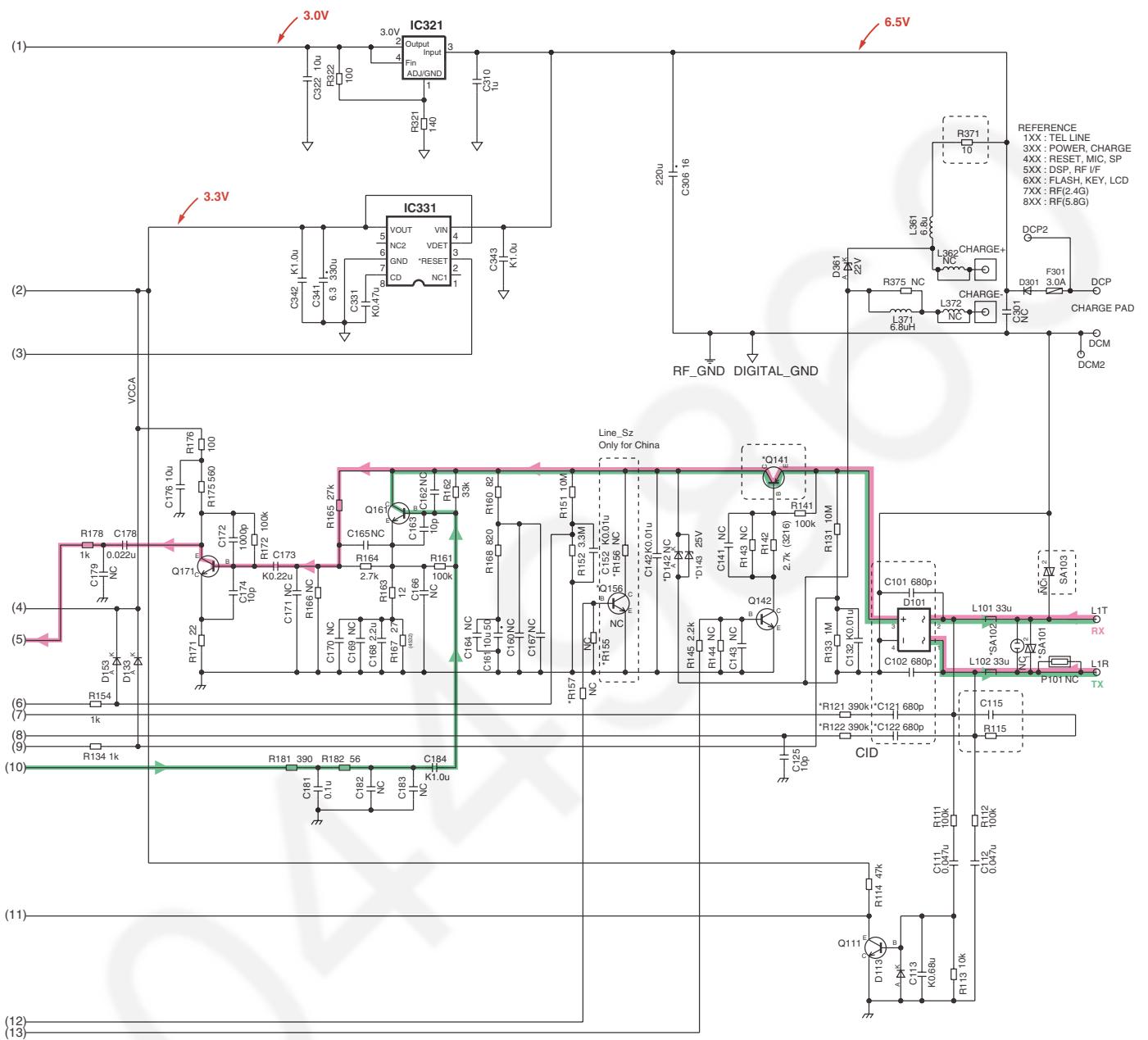
Components identified by \triangle mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

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

14.2. Schematic Diagram (Base Unit_Main)



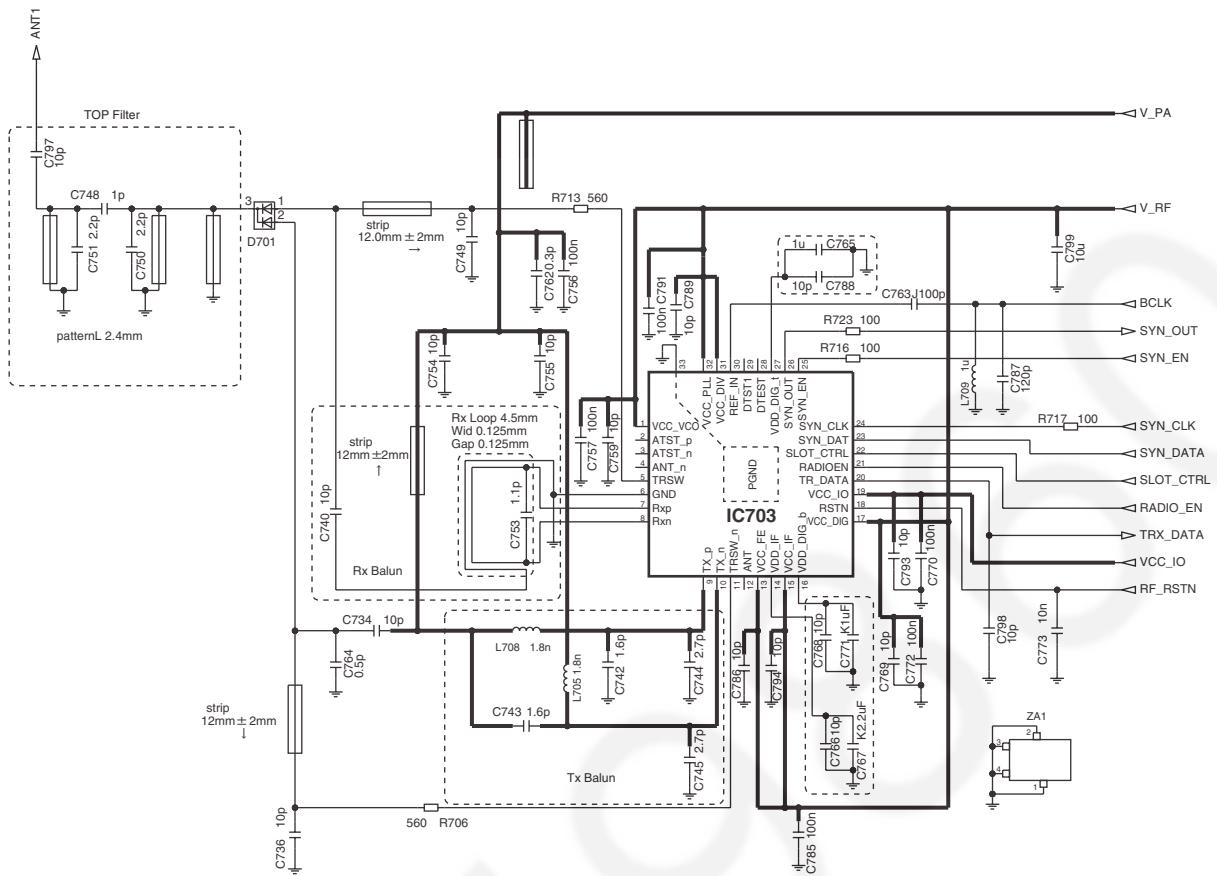
NC: No Components



NC: No Components

KX-TG3611/3612BX SCHEMATIC DIAGRAM (Base Unit)

14.3. Schematic Diagram (Base Unit_RF Part)



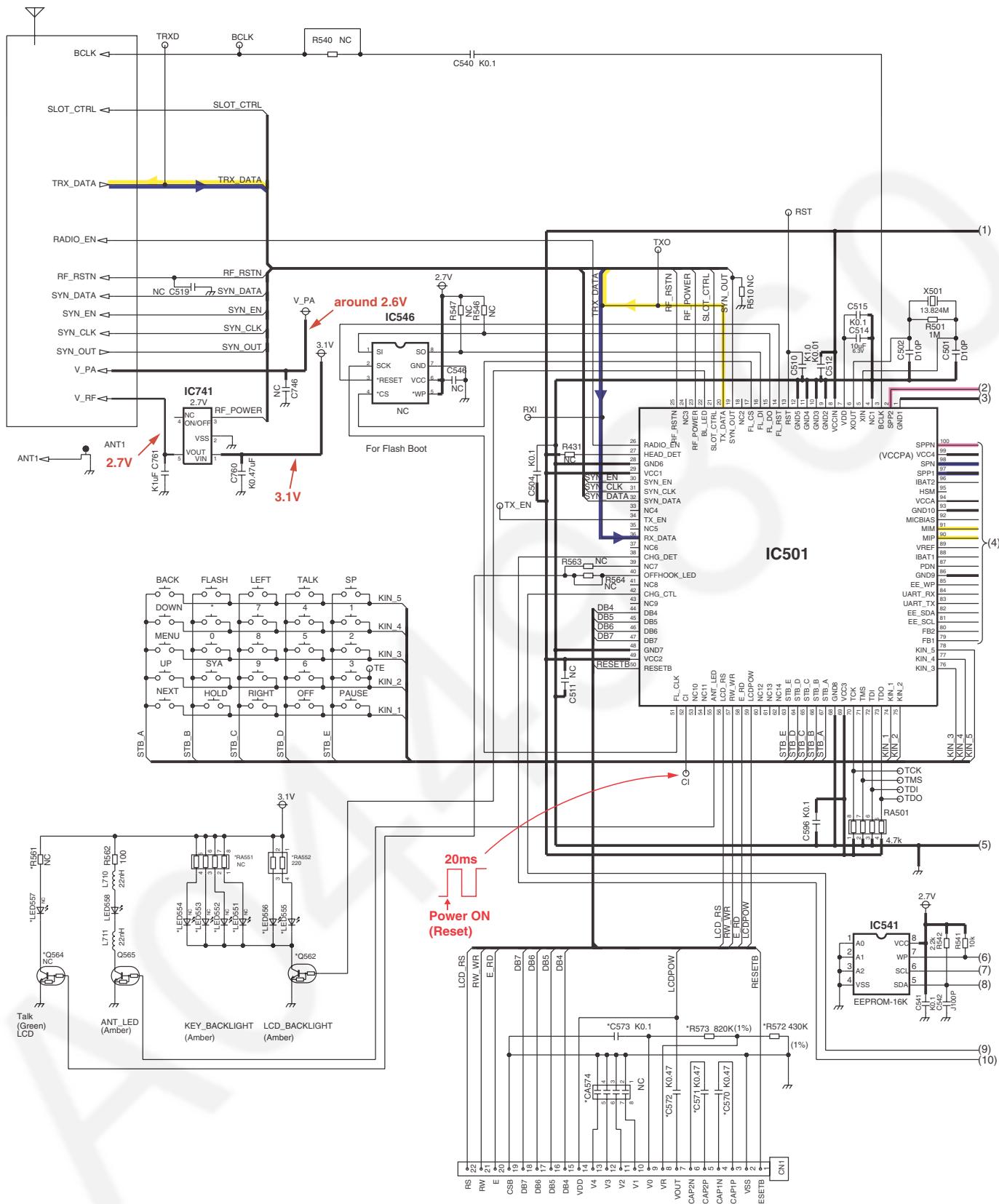
NC: No Components

KX-TG3611/3612 SCHEMATIC DIAGRAM (Base Unit RF Part)

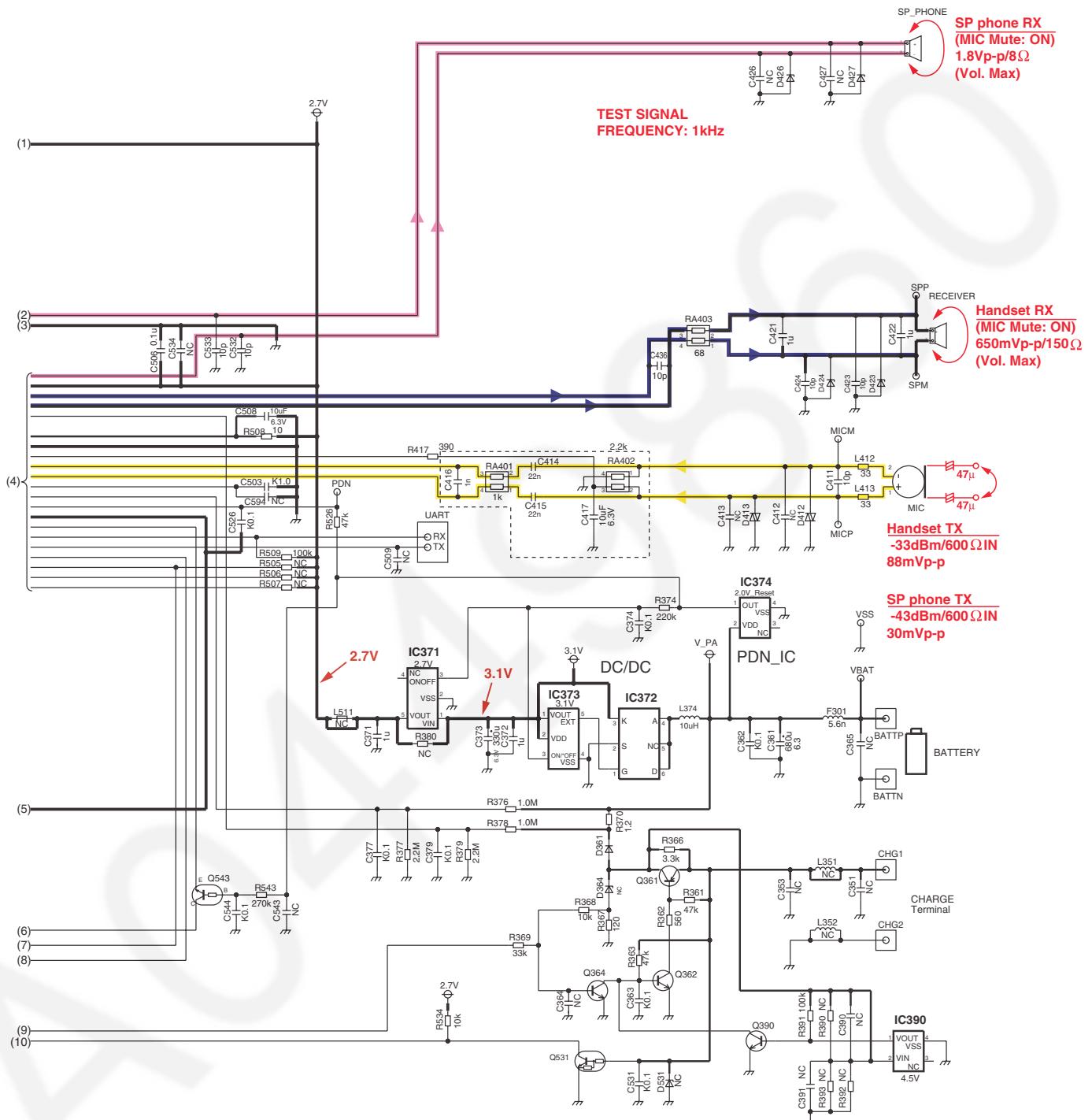
Memo

AO449860

14.4. Schematic Diagram (Handset_Main)

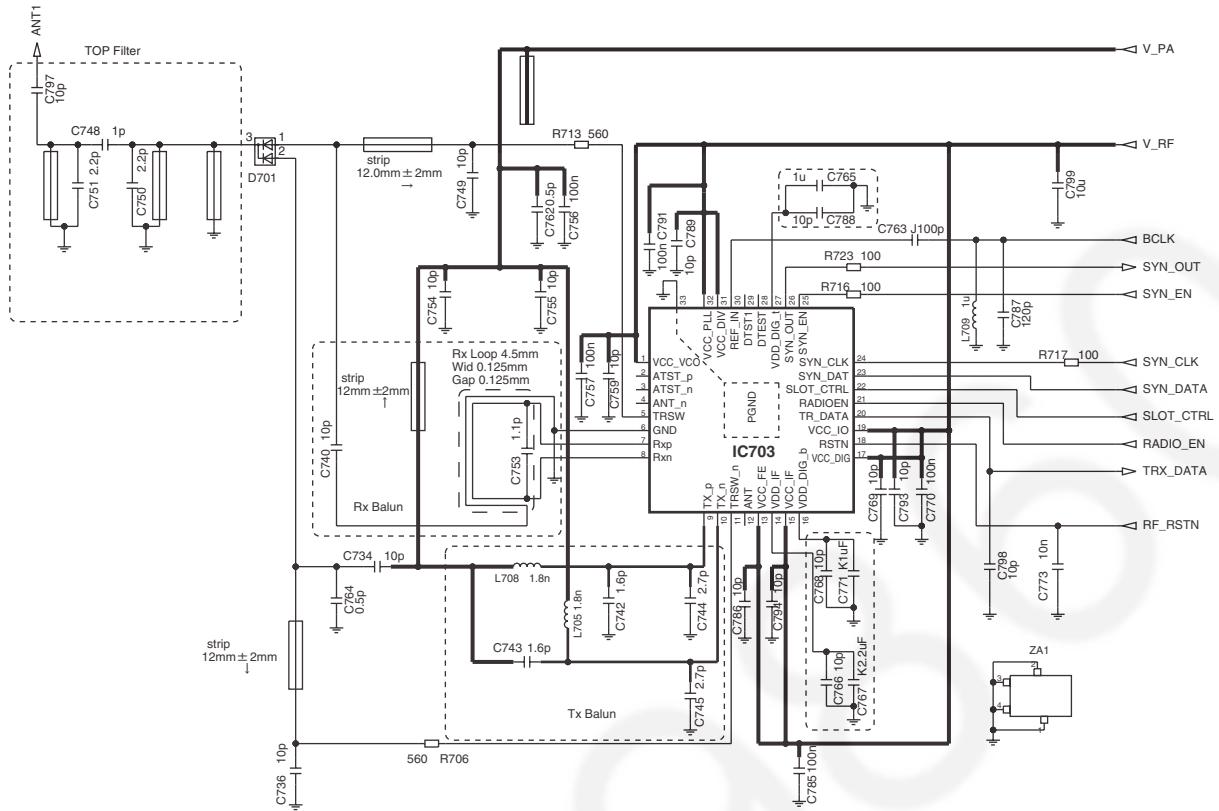


NC: No Components



KX-TGA361 SCHEMATIC DIAGRAM (Handset_Main)

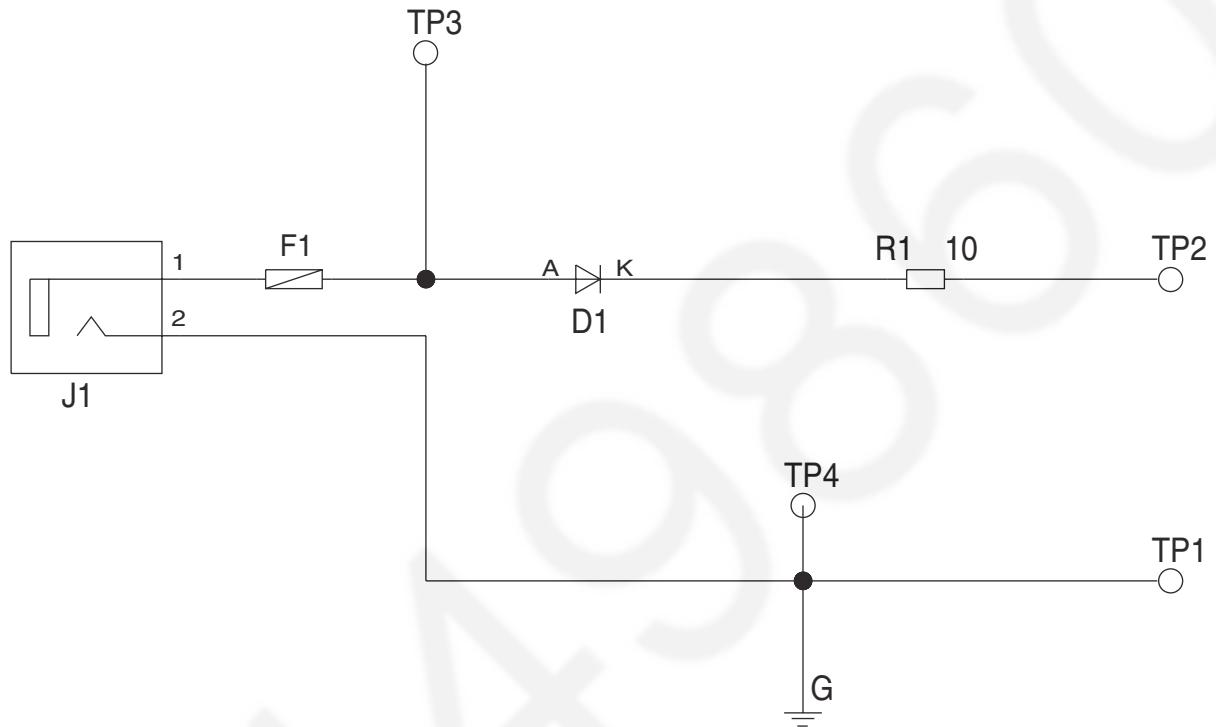
14.5. Schematic Diagram (Handset_RF Part)



NC: No Components

KX-TGA361 SCHEMATIC DIAGRAM (Handset RF Part)

14.6. Schematic Diagram (Charger Unit)



SCHEMATIC DIAGRAM (Charger Unit)

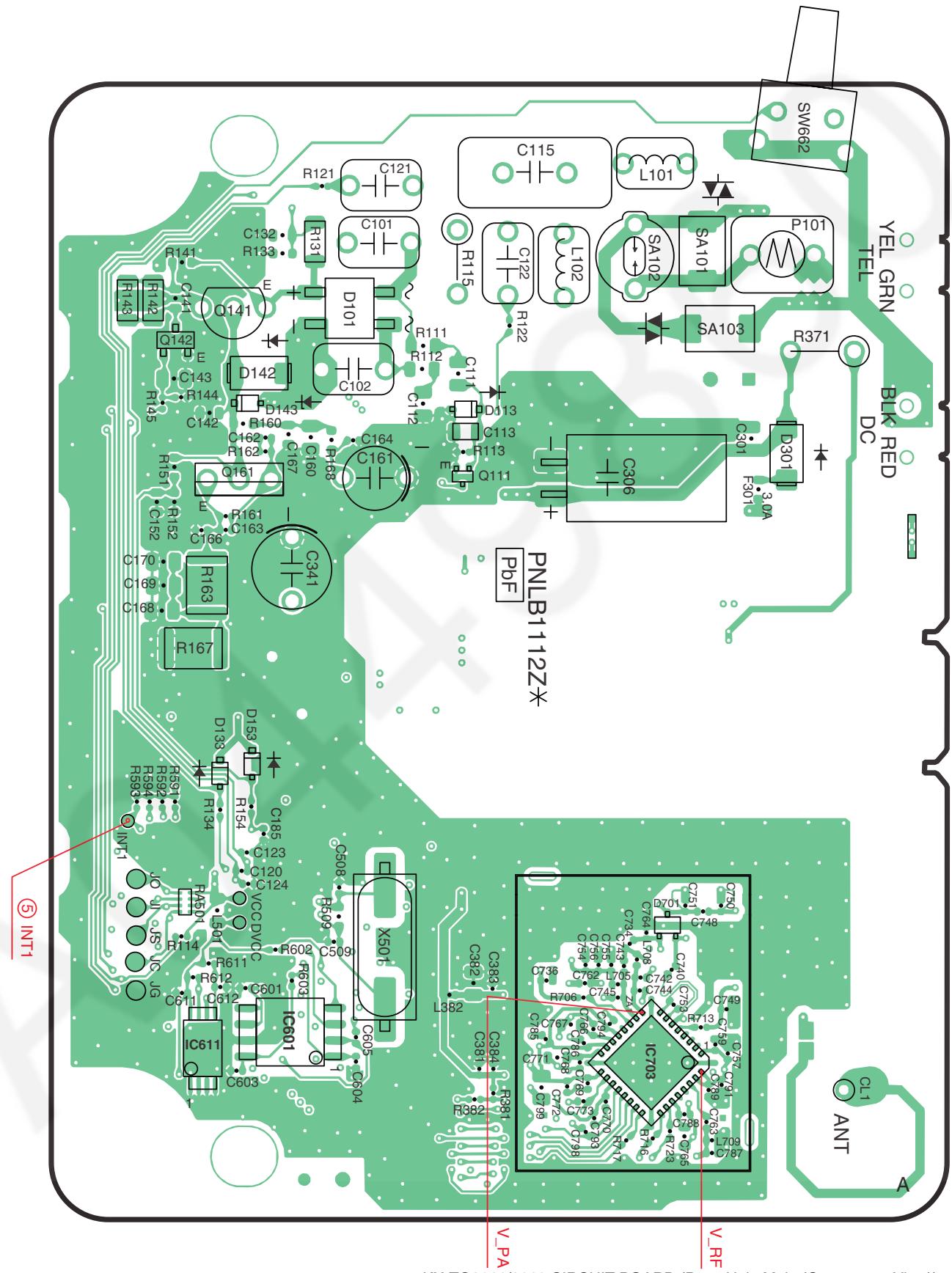
Memo

AO449860

15 Printed Circuit Board

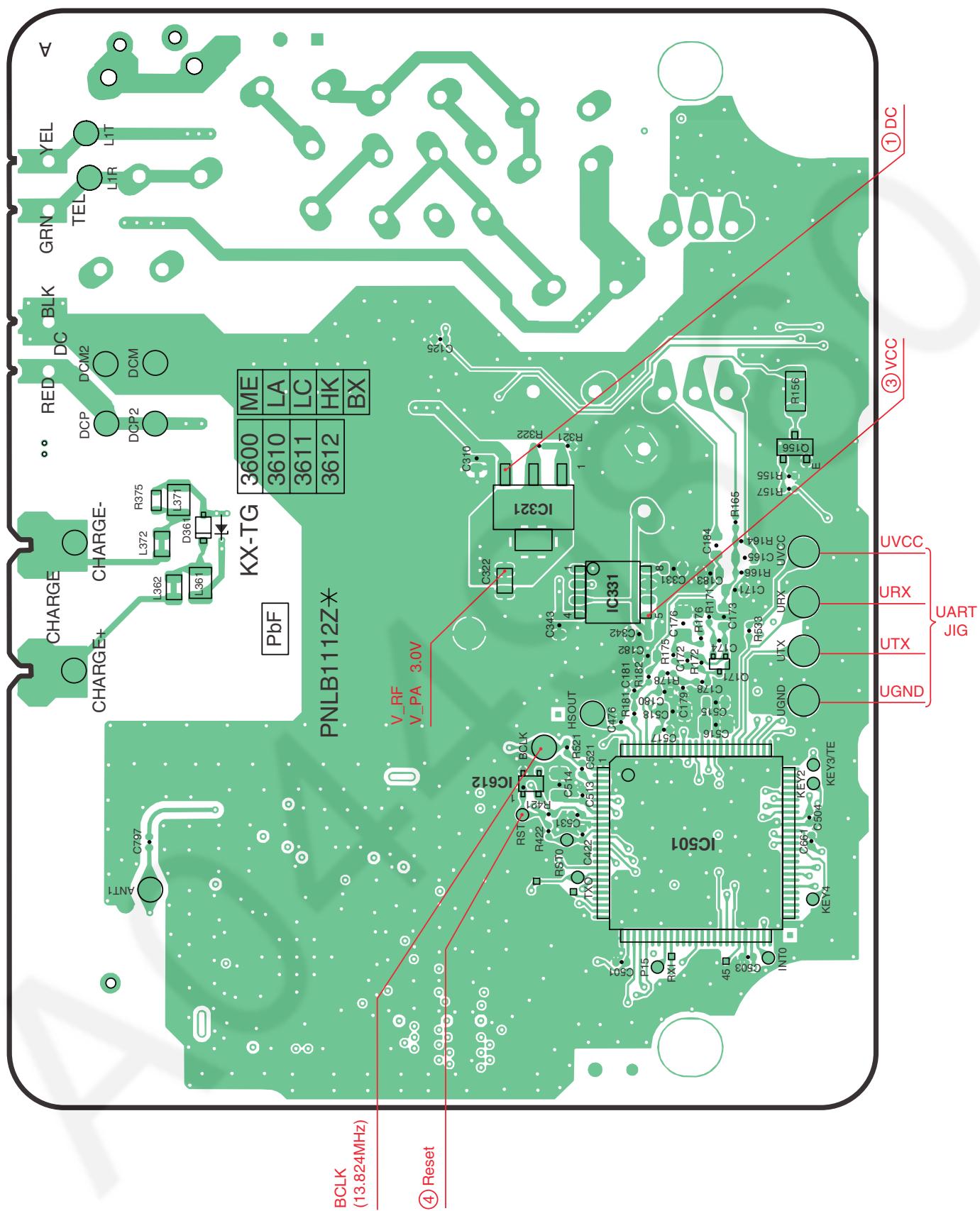
15.1. Circuit Board (Base Unit_Main)

15.1.1. Component View



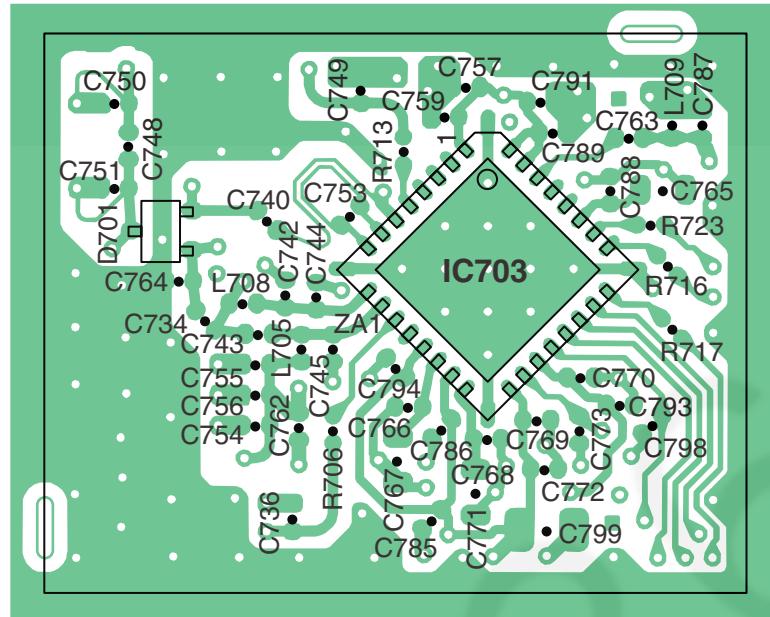
KX-TG3611/3612 CIRCUIT BOARD (Base Unit_Main (Component View))

15.1.2. Bottom View



KX-TG3611/3612 CIRCUIT BOARD (Base Unit_Main (Bottom View))

15.2. Circuit Board (Base Unit_RF Part)



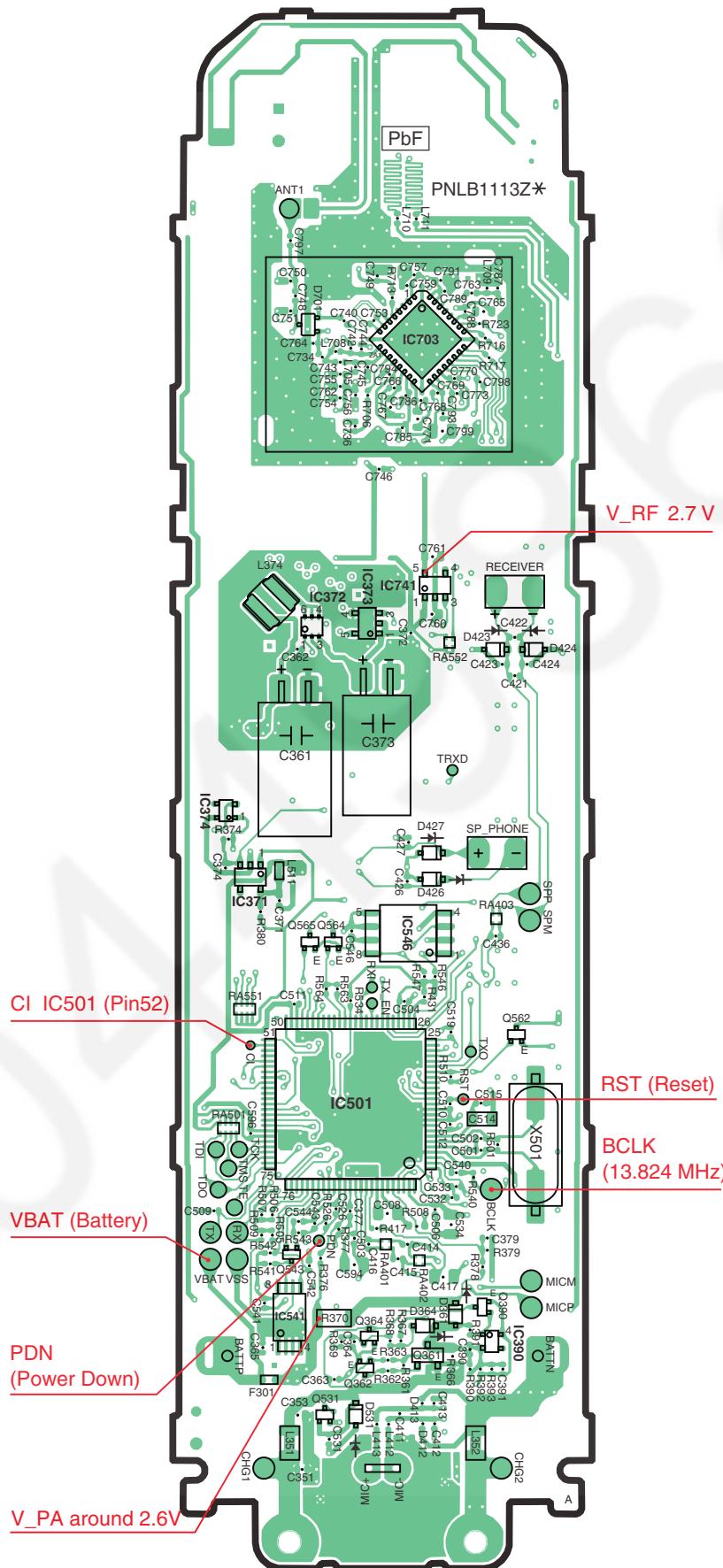
KX-TG3611/3612 CIRCUIT BOARD (Base Unit_RF (Component View))

Memo

AO449860

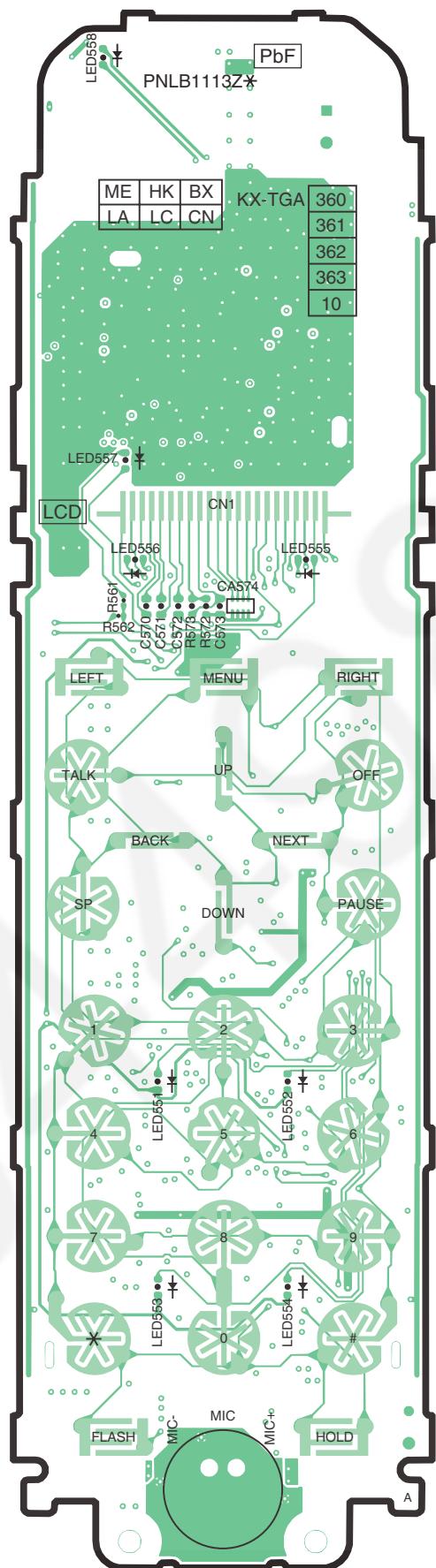
15.3. Circuit Board (Handset_Main)

15.3.1. Component View



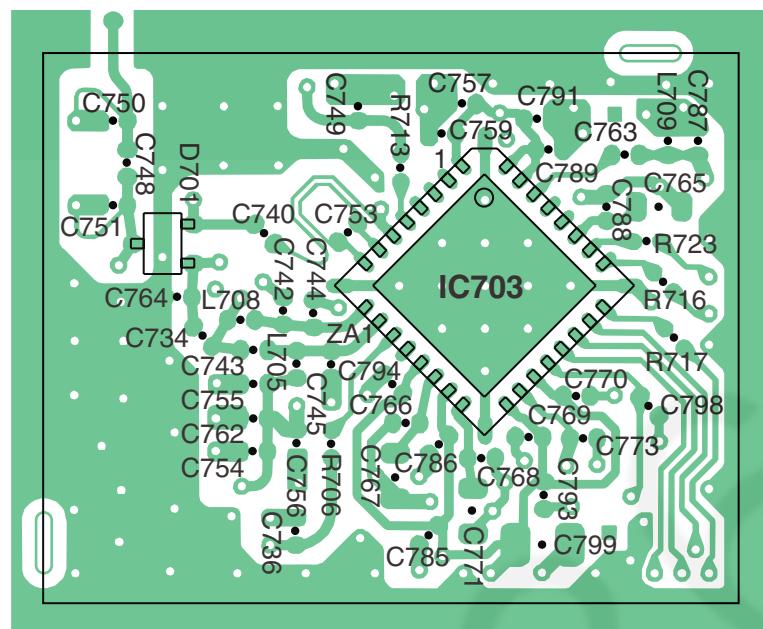
KX-TGA361 CIRCUIT BOARD (Handset_Main (Component View))

15.3.2. Bottom View



KX-TGA361 CIRCUIT BOARD (Handset_Main (Bottom View))

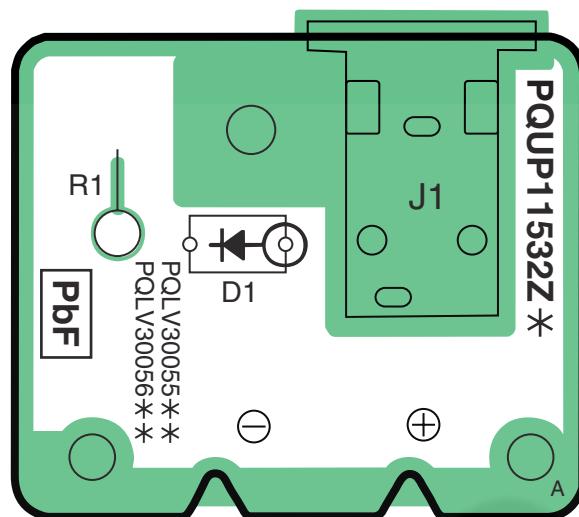
15.4. Circuit Board (Handset_RF Part)



KX-TGA361 CIRCUIT BOARD (Handset_RF (Component View))

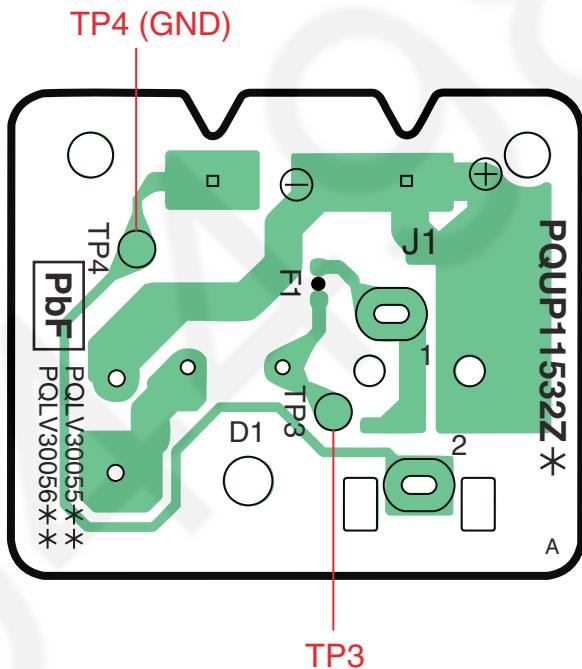
15.5. Circuit Board (Charger Unit)

15.5.1. Component View



CIRCUIT BOARD (Charger Unit (Component View))

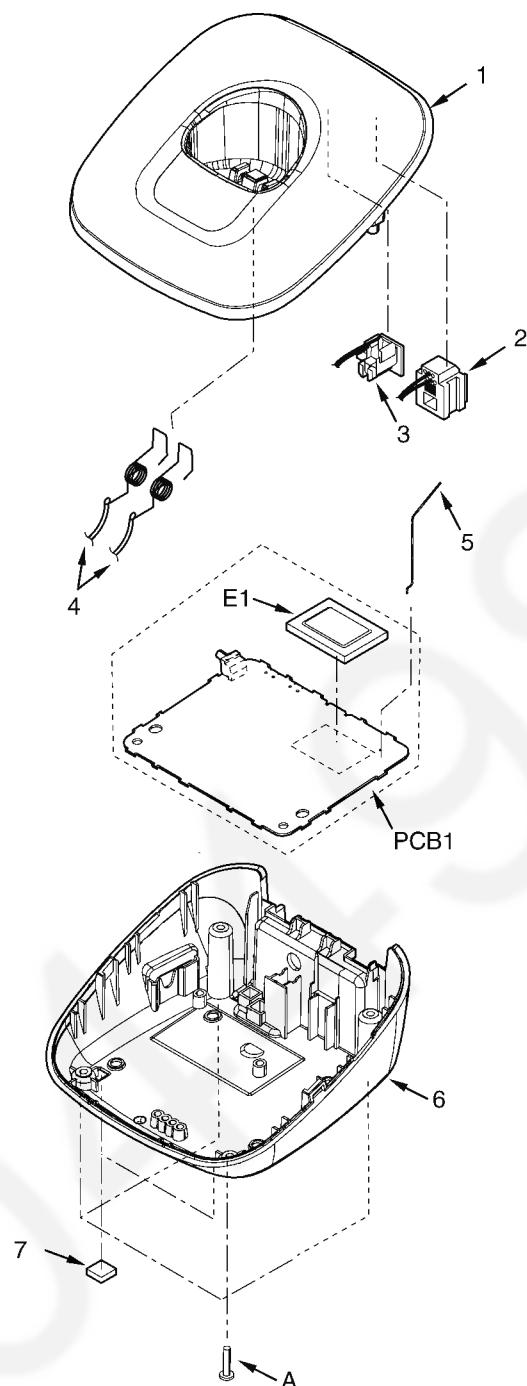
15.5.2. Bottom View



CIRCUIT BOARD (Charger Unit (Bottom View))

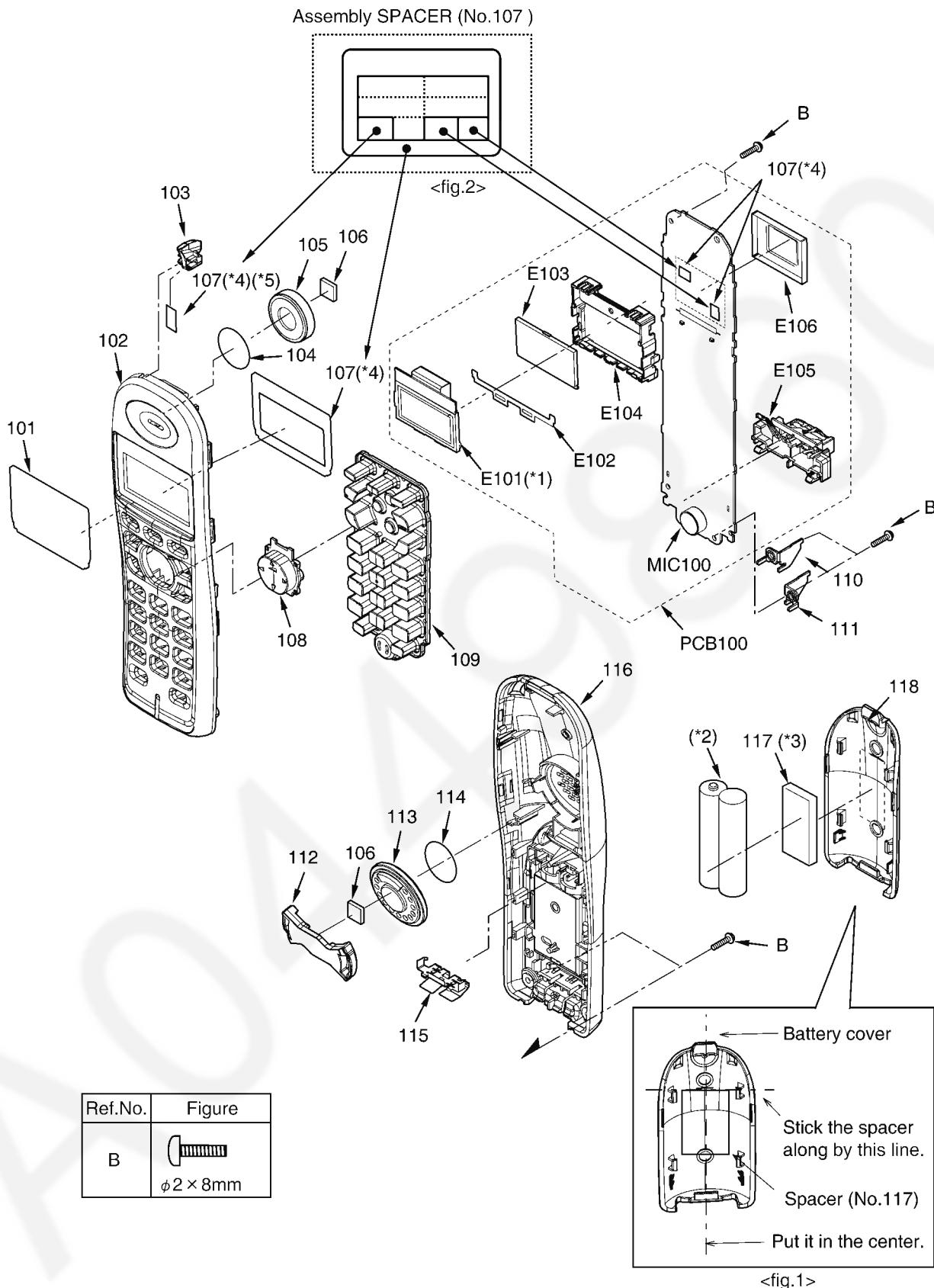
16 Exploded View and Replacement Parts List

16.1. Cabinet and Electrical Parts (Base Unit)

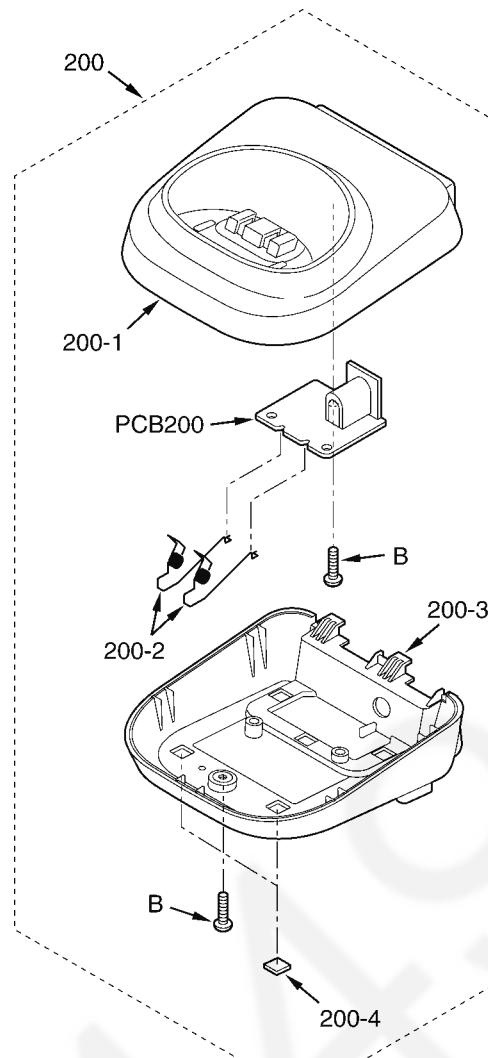


Ref.No.	Figure
A	 $\phi 2.6 \times 12\text{mm}$

16.2. Cabinet and Electrical Parts (Handset)

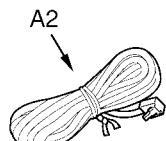
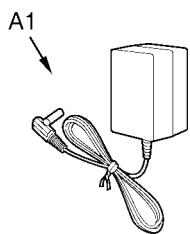


16.3. Cabinet and Electrical Parts (Charger Unit)



Ref.No.	Figure
B	 φ2 x 8 mm

16.4. Accessories



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 manufacturer'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) $k=1000\Omega$, $M=1000k\Omega$

All capacitors are in MICRO FARADS (μF) $p=\mu\mu F$

*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

ECCF:semi-conductor	ECCD,ECKD,ECBT,F1K,ECUV:Ceramic
ECQS: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	PNKM1087Z1	CABINET BODY (for KX-TG3611BXB) (for KX-TG3612BXB)		PS-HB
1	PNKM1087Y2	CABINET BODY (for KX-TG3611BXS) (for KX-TG3612BXS)		PS-HB
2	PQJJ1T039S	JACK, MODULAR		
3	K2ECYZ000001	JACK, DC		
4	PNJT1031Z	CHARGE TERMINAL		
5	PNLA1021Z	ANTENNA		
6	PNKF1062Z1	CABINET COVER (for KX-TG3611BXB) (for KX-TG3612BXB)		PS-HB

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	6	PNKF1062Z2	CABINET COVER (for KX-TG3611BXS) (for KX-TG3612BXS)	PS-HB
	7	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	

16.5.1.2. Main P.C. Board Parts

Note:

(*) When you have replaced IC501 or IC611, adjust X501.

Refer to **Check and Adjust X501 (Base Unit) Frequency** (P.71).

(*) When replacing IC703, refer to **How to Replace the LLP (Leadless Leadframe Package) IC** (P.64).

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

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB1	PNWPG3611BXH	MAIN P.C. BOARD ASS'Y (RTL) (for KX-TG3611BXB)	
	PCB1	PNWPG3612BXH	MAIN P.C. BOARD ASS'Y (RTL) (for KX-TG3612BXB)	
			(ICs)	
	IC321	C0CBAYG00016	IC	S
	IC331	C0DBFGD00017	IC	
	IC501	C2HBBY000111	IC (*)	
	IC611	PNWIG3611BXH	IC (*) (for KX-TG3611BXB)	
	IC611	PNWIG3612BXH	IC (*) (for KXTG3612BXS)	
	IC703	C1CB00003094	IC (*) (TRANSISTORS)	
			(TRANSISTORS)	
	Q111	2SC6054JSL	TRANSISTOR(SI)	
	Q141	B1ACGP000008	TRANSISTOR(SI)	
	Q142	PQVTBF822T7	TRANSISTOR(SI)	S
	Q161	2SD1994A	TRANSISTOR(SI)	
	Q171	2SC6054JSL	TRANSISTOR(SI)	
			(DIODES)	
	D101	PQVDMDS	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
	D701	B0DDCD000001	DIODE(SI)	
			(COILS)	
	L101	PQLQXF330K	COIL	S
	L102	PQLQXF330K	COIL	S
	L361	G1C6R8MA0072	COIL	
	L371	G1C6R8MA0072	COIL	
	L705	G1C1N8Z00006	COIL	
	L708	G1C1N8Z00006	COIL	
	L709	G1C1R0KA0096	COIL	
			(COMPONENTS PART)	
	RA501	D1H84724A013	RESISTOR ARRAY (VARISTOR)	
	SA102	J0LF00000026	VARISTOR (SURGE ABSORBER)	S
			(RESISTORS)	
	R111	PQ4R10XJ104	100k	S
	R112	PQ4R10XJ104	100k	S
	R113	ERJ2GEJ103	10k	
	R114	ERJ2GEJ473	47k	
	R121	ERJ2GEJ394	390k	
	R122	ERJ2GEJ394	390k	
	R131	PQ4R18XJ106	10M	S
	R133	ERJ3GEYJ105	1M	
	R134	ERJ2GEJ102	1k	
	R141	ERJ3GEYJ104	100k	
	R142	PQ4R18XJ272	2.7k	S

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R145	ERJ2GEJ222	2.2k	
	R151	ERJ3GEYJ106	10M	
	R152	ERJ3GEYJ335	3.3M	
	R154	ERJ2GEJ102	1k	
	R160	ERJ3GEYJ820	82	
	R161	ERJ2GEJ104	100k	
	R162	ERJ2GEJ473	47k	
	R163	ERJ12YJ120	12	
	R164	ERJ2GEJ272	2.7k	
	R165	ERJ2GEJ273X	27k	
	R167	ERJ12YJ270	27	
	R168	ERJ3GEYJ821	820	
	R171	ERJ2GEJ220	22	
	R172	ERJ2GEJ104	100k	
	R175	ERJ2GEJ561	560	
	R176	ERJ2GEJ101	100	
	R178	ERJ2GEJ102	1k	
	R181	ERJ2GEJ391	390	
	R182	ERJ2GEJ560X	56	
	R321	ERJ2RKF1400	140	
	R322	ERJ2RKF1000	100	
	R371	ERG2SJ100E	10	
	R382	ERJ2GE0R00	0	
	R421	ERJ2GEJ473	47k	
	R422	ERJ2GEJ102	1k	
	R509	ERJ3GEYJ105	1M	
	R533	ERJ2GEJ472X	4.7k	
	R611	ERJ2GEJ222	2.2k	
	R612	ERJ2GEJ103	10k	
	R706	ERJ2GEJ561	560	
	R713	ERJ2GEJ561	560	
	R716	ERJ2GEJ101	100	
	R717	ERJ2GEJ101	100	
	R723	ERJ2GEJ101	100	
		(CAPACITORS)		
	C101	F1B2H681A070	680p	
	C102	F1B2H681A070	680p	
	C111	F1J2A473A024	0.04	
	C112	F1J2A473A024	0.04	
	C113	PQCUV1A684KB	0.68	
	C120	ECUE1H102KBQ	0.001	
	C121	F1B2H681A070	680p	
	C122	F1B2H681A070	680p	
	C123	ECUE1H100DCQ	10p	
	C124	ECUE1H100DCQ	10p	
	C125	ECUE1H100DCQ	10p	
	C132	ECUV1H103KBV	0.01	
	C142	ECUV1H103KBV	0.01	
	C152	ECUV1H103KBV	0.01	
	C161	F2A1H100B132	10	
	C163	ECUE1H100DCQ	10p	
	C168	PQCUV1A225KB	2.2	
	C172	ECUE1H102KBQ	0.001	
	C173	ECUV1A224KBV	0.22	
	C174	ECUE1H100DCQ	10p	
	C176	PQCUV0J106KB	10	
	C178	ECUE1C223KBQ	0.022	
	C180	ECUE1H100DCQ	10p	
	C181	ECUE1A104KBQ	0.1	
	C184	ECUV1A105KBV	1	
	C306	F2A1C2210101	220	
	C310	ECUV1A105KBV	1	
	C322	PQCUV0J106KB	10	
	C331	ECUV1A474KBV	0.47	
	C341	F2A0J3310055	330	
	C342	ECUV0J105KBV	1	
	C343	ECUV1A105KBV	1	
	C381	ECUE1A104KBQ	0.1	
	C382	PQCUV0J106KB	10	
	C384	F1G1HR50A480	0.5p	
	C422	ECUE1A104KBQ	0.1	
	C476	ECUE1H100DCQ	10p	
	C501	ECUE1A104KBQ	0.1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C503	ECUE1A104KBQ	0.1	
	C504	ECUE1A104KBQ	0.1	
	C508	ECUE1H100DCQ	10p	
	C509	ECUE1H100DCQ	10p	
	C513	ECUE1A104KBQ	0.1	
	C514	PQCUV0J106KB	10	
	C515	ECUV1A105KBV	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	
	C661	ECUE1H102KBQ	0.001	
	C734	ECUE1H100DCQ	10p	
	C736	ECUE1H100DCQ	10p	
	C740	ECUE1H100DCQ	10p	
	C742	F1G1H1R6A480	1.6p	
	C743	F1G1H1R6A480	1.6p	
	C744	F1G1H2R7A480	2.7p	
	C745	F1G1H2R7A480	2.7p	
	C748	F1G1H1R0A480	1p	
	C749	ECUE1H100DCQ	10p	
	C750	F1G1H2R2A480	2.2p	
	C751	F1G1H2R2A480	2.2p	
	C753	F1G1H1R1A480	1.1p	
	C754	ECUE1H100DCQ	10p	
	C755	ECUE1H100DCQ	10p	
	C756	ECUE1A104KBQ	0.1	
	C757	ECUE1A104KBQ	0.1	
	C759	ECUE1H100DCQ	10p	
	C762	F1G1HR30A561	0.3p	
	C763	ECUE1H101JCQ	100p	
	C764	F1G1HR50A480	0.5p	
	C765	ECUV1A105KBV	1	
	C766	ECUE1H100DCQ	10p	
	C767	ECUV1A225KB	2.2	
	C768	ECUE1H100DCQ	10p	
	C769	ECUE1H100DCQ	10p	
	C770	ECUE1A104KBQ	0.1	
	C771	ECUV1A105KBV	1	
	C772	ECUE1A104KBQ	0.1	
	C773	ECUE1C103KBQ	0.01	
	C785	ECUE1A104KBQ	0.1	
	C786	ECUE1H100DCQ	10p	
	C787	ECUE1H121JCQ	120p	
	C788	ECUE1H100DCQ	10p	
	C789	ECUE1H100DCQ	10p	
	C791	ECUE1A104KBQ	0.1	
	C793	ECUE1H100DCQ	10p	
	C794	ECUE1H100DCQ	10p	
	C797	ECUE1H100DCQ	10p	
	C798	ECUE1H100DCQ	10p	
	C799	PQCUV0J106KB	10	
	L501	ERJ6GEY0R00	0	
		(OTHERS)		
	E1	PNMC1014Z	CASE, MAGNETIC SHIELD (*3)	
	X501	H0J138500003	CRYSTAL OSCILLATOR (*1)	
	F301	K5H302Y00003	FUSE	S
	SW662	EVQPF108K	SPECIAL SWITCH, TACKLE	

16.5.2. Handset

16.5.2.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	101	PNGP1053Z1	PANEL, LCD (for KX-TGA361BXB)	PC-V2
	101	PNGP1053Y2	PANEL, LCD (for KX-TGA361BXS)	PC-V2

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	102	PNKM1086Z1	CABINET BODY (for KX-TGA361BXB)	PS-HB
	102	PNKM1086X2	CABINET BODY (for KX-TGA361BXS)	PS-HB
	103	PNHR1012Z	OPTIC CONDUCTIVE PARTS, LED LENS	PS-HB
	104	PQHS10467Z	SPACER, RECEIVER NET	
	105	LOAD02A00028	RECEIVER	
	106	PQHG10729Z	RUBBER PARTS, RECEIVER CUSHION	
	107	PNYE1016Z	SPACER, CUSHION LCD	
	108	PNBC1003Z2	BUTTON, NAVI KEY (for KX-TGA361BXB)	ABS-HB
	108	PNBC1003Y3	BUTTON, NAVI KEY (for KX-TGA361BXS)	ABS-HB
	109	PNJK1003U	KEYBOARD SWITCH (for KX-TGA361BXB)	
	109	PNJK1003M	KEYBOARD SWITCH (for KX-TGA361BXS)	
	110	PNJT1001Y	CHARGE TERMINAL (L)	
	111	PNJT1002Y	CHARGE TERMINAL (R)	
	112	PQHR11313Z	GUIDE, SPEAKER	ABS-HB
	113	LOAD02A00026	SPEAKER	
	114	PQHS10622Z	SPACER, SPEAKER NET	
	115	PQJC10056X	BATTERY TERMINAL	
	116	PNKF1011Z2	CABINET COVER (for KX-TGA361BXB)	ABS-HB
	116	PNKF1011Z1	CABINET COVER (for KX-TGA361BXS)	ABS-HB
	117	PQHS10561Y	SPACER, BATTERY	
	118	PNKK1001Z2	LID, BATTERY (for KX-TGA361BXB)	ABS-HB
	118	PNKK1001Z1	LID, BATTERY (for KX-TGA361BXS)	ABS-HB

16.5.2.2. Main P.C. Board Parts

Note:

- (*)1 When you have replaced IC501 or IC541, adjust X501. Refer to **Check and Adjust X501 (Handset) Frequency** (P.71) and **Adjust Battery Low Detector Voltage (Handset)** (P.71).
- (*)2 When replacing IC703, refer to **How to Replace the LLP (Leadless Leadframe Package) IC** (P.64).
- (*)3 When replacing the handset LCD, See **How to Replace the Handset LCD** (P.70).
- (*)4 When removing E106, use special tools (ex. Hot air disordering tool).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB100	PNWPGA361BXR	MAIN P.C. BOARD ASS'Y (RTL)	
			(ICs)	
	IC371	C0DBGYY00297	IC	
	IC373	C0DBAYY00067	IC	
	IC374	C0EBD000355	IC	
	IC390	PQVIC61CN45N	IC	S
	IC501	C2HBBY000109	IC (*1)	
	IC541	PNWIGA361BXR	IC (*1)	
	IC703	C1CB00003094	IC (*2)	
	IC741	C0CBCAC00252	IC	
			(TRANSISTORS)	
	Q361	B1ADGE000004	TRANSISTOR(SI)	
	Q362	2SC6054JSL	TRANSISTOR(SI)	
	Q364	2SC6054JSL	TRANSISTOR(SI)	
	Q390	2SC6054JSL	TRANSISTOR(SI)	
	Q531	UNR921EJ0L	TRANSISTOR(SI)	
	Q562	UNR92AVJ0L	TRANSISTOR(SI)	
	Q543	UNR9215J0L	TRANSISTOR(SI)	
	Q565	UNR92AVJ0L	TRANSISTOR(SI)	
	IC372	MTM767200LBF	TRANSISTOR(SI)	
			(DIODES)	
	D361	MA2ZD0200L	DIODE(SI)	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	D423	MA8043L	DIODE(SI)	S
	D424	MA8043L	DIODE(SI)	S
	D426	MA8043L	DIODE(SI)	S
	D427	MA8043L	DIODE(SI)	S
	D701	B0DDCD000001	DIODE(SI)	
	LED555	B3ACB0000216	DIODE(SI)	S
	LED556	B3ACB0000216	DIODE(SI)	
	LED558	B3ACB0000216	DIODE(SI)	
			(COILS)	
	L711	MQLRF22NGFB	COIL	
	L374	G1C100MA0395	COIL	
	L705	G1C1N8Z00006	COIL	
	L708	G1C1N8Z00006	COIL	
	L709	G1C1R0KA0096	COIL	
	L710	MQLRF22NGFB	COIL	
	F301	PQLQR2M5N6K	COIL	S
			(COMPONENTS PARTS)	
	RA401	D1H410220001	RESISTOR ARRAY	
	RA402	D1H422220001	RESISTOR ARRAY	
	RA403	D1H468020001	RESISTOR ARRAY	
	RA501	D1H84724A013	RESISTOR ARRAY	S
	RA552	D1H422120001	RESISTOR ARRAY	
			(VARISTORS)	
	D412	D4ED1180A013	VARISTOR SURGE	
	D413	D4ED1180A013	VARISTOR SURGE	
			(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	
	R374	ERJ2GEJ224	220k	
	R376	ERJ2GEJ105X	1M	
	R377	ERJ2GEJ225	2.2M	
	R378	ERJ2GEJ105X	1M	
	R379	ERJ2GEJ225	2.2M	
	R391	ERJ2GEJ104	100k	
	R417	ERJ2GEJ391	390	
	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	
	R562	ERJ2GEJ101	100	
	R572	D1BB4303A055	430	
	R573	D1BB8203A055	820	
	R706	ERJ2GEJ561	560	
	R713	ERJ2GEJ561	560	
	R716	ERJ2GEJ101	100	
	R717	ERJ2GEJ101	100	
	R723	ERJ2GEJ101	100	
	L412	ERJ2GEJ330	33	
	L413	ERJ2GEJ330	33	
			(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	
	C411	ECUE1H100DCQ	10p	
	C414	ECUE1C223KBQ	0.022	
	C415	ECUE1C223KBQ	0.022	
	C416	ECUE1H102KBQ	0.001	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C417	PQCUV0J106KB	10	
	C421	ECUE0J105KBQ	1	
	C422	ECUE0J105KBQ	1	
	C423	ECUE1H100DCQ	10p	
	C424	ECUE1H100DCQ	10p	
	C436	ECUE1H100DCQ	10p	
	C501	ECUE1H100DCQ	10p	
	C502	ECUE1H100DCQ	10p	
	C503	ECUE0J105KBQ	1	
	C504	ECUE1A104KBQ	0.1	
	C506	ECUE1A104KBQ	0.1	
	C508	PQCUV0J106KB	10	
	C510	ECUE0J105KBQ	1	
	C512	ECUE1C103KBQ	0.01	
	C514	PQCUV0J106KB	10	
	C515	ECUE1A104KBQ	0.1	
	C526	ECUE1A104KBQ	0.1	
	C531	ECUE1A104KBQ	0.1	
	C532	ECUE1H100DCQ	10p	
	C533	ECUE1H100DCQ	10p	
	C540	ECUE1A104KBQ	0.1	
	C541	ECUE1A104KBQ	0.1	
	C542	ECUV1H101JCQ	100p	
	C544	ECUE1A104KBQ	0.1	
	C570	ECUV1C474KBV	0.47	
	C571	ECUV1C474KBV	0.47	
	C572	ECUV1C474KBV	0.47	
	C573	ECUV1C104KBV	0.1	
	C596	ECUE1A104KBQ	0.1	
	C734	ECUE1H100DCQ	10p	
	C736	ECUE1H100DCQ	10p	
	C740	ECUE1H100DCQ	10p	
	C742	F1G1H1R6A480	1.6p	
	C743	F1G1H1R6A480	1.6p	
	C744	F1G1H2R7A480	2.7p	
	C745	F1G1H2R7A480	2.7p	
	C748	F1G1H1R0A480	1p	
	C749	ECUE1H100DCQ	10p	
	C750	F1G1H2R2A480	2.2p	
	C751	F1G1H2R2A480	2.2p	
	C753	F1G1H1R1A480	1.1p	
	C754	ECUE1H100DCQ	10p	
	C755	ECUE1H100DCQ	10p	
	C756	ECUE1A104KBQ	0.1	
	C757	ECUE1A104KBQ	0.1	
	C759	ECUE1H100DCQ	10p	
	C760	ECUV1A474KBV	0.47	
	C761	ECUV1A105KBV	1	
	C762	F1G1H1R50A480	0.5p	
	C763	ECUE1H101JCQ	100p	
	C764	F1G1H1R50A480	0.5p	
	C765	ECUV1A105KBV	1	
	C766	ECUE1H100DCQ	10p	
	C767	ECUV1A225KB	2.2	
	C768	ECUE1H100DCQ	10p	
	C769	ECUE1H100DCQ	10p	
	C770	ECUE1A104KBQ	0.1	
	C771	ECUV1A105KBV	1	
	C773	ECUE1C103KBQ	0.01	
	C785	ECUE1A104KBQ	0.1	
	C786	ECUE1H100DCQ	10p	
	C787	ECUE1H121JCQ	120p	
	C788	ECUE1H100DCQ	10p	
	C789	ECUE1H100DCQ	10p	
	C791	ECUE1A104KBQ	0.1	
	C793	ECUE1H100DCQ	10p	
	C794	ECUE1H100DCQ	10p	
	C797	ECUE1H100DCQ	10p	
	C798	ECUE1H100DCQ	10p	
	C799	PQCUV0J106KB	10	
			(OTHERS)	
	MIC100	L0CBAY000018	MICROPHONE	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	E101	L5DCBYY00003	LIQUID CRYSTAL DISPLAY (*3)	
	E102	PNHX1136Z	COVER, LCD	
	E103	PQHRI1285Z	TRANSPARENT PLATE, LCD PLATE	PMMA-HB
	E104	PNHR1134Z	GUIDE, LCD	ABS-HB
	E105	PQWE10050Z	BATTERY TERMINAL	
	E106	PNMC1014Z	CASE, MAGNETIC SHIELD (*4)	
	X501	H0J138500003	CRYSTALOSCILLATOR (*1)	

16.5.3. Charger Unit

16.5.3.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	200	PNLC1001ZB	CHARGER UNIT ASS'Y without NAME PLATE (RTL) (for KX-TG3612BXB)	
	200	PNLC1001WS	CHARGER UNIT ASS'Y without NAME PLATE (RTL) (for KX-TG3612BXS)	
	200-1	PNKM1015Z1	CABINET BODY (for KX-TG3612BXB)	PS-HB
	200-1	PNKM1015YB	CABINET BODY (for KX-TG3612BXS)	PS-HB
	200-2	PNJT1010Z	CHARGE TERMINAL	
	200-3	PNKF1012Z1	CABINET COVER (for KX-TG3612BXB)	PS-HB
	200-3	PNKF1012Z2	CABINET COVER (for KX-TG3612BXS)	PS-HB
	200-4	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	

16.5.3.2. Main P.C. Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB200	PQWPTGA721CH	MAIN P.C.BOARD ASS'Y (RTL)	
			(DIODE)	
D1	BOJAME000095	DIODE(SI)		
			(JACK)	
J1	K2ECYB000001	JACK		
			(RESISTOR)	
R1	ERG2SJ100E	10		
			(FUSE)	
F1	K5H302Y00003	FUSE		

16.5.4. Accessories

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
▲	A1	PQLV219BXZ	AC ADAPTOR	
	A2	PQJA10075Z	TELEPHONE CORD	

16.5.5. Screws

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	A	XTB26+12GFJ	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.70).

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

Y.S/N
KXTG3611BXB
KXTG3611BXS
KXTG3612BXB
KXTG3612BXS
KXTGA361BXB
KXTGA361BXS