ORDER NO. KM41401788CE
F13

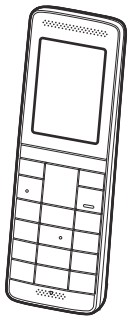
Service Manual

Telephone Equipment

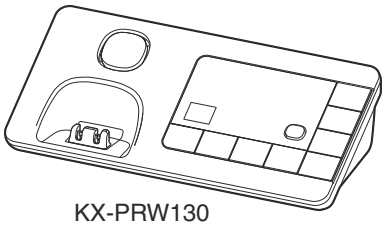
Model No. KX-PRW130W
KX-PRWA13W

Premium Design Phone with Smartphone Connect

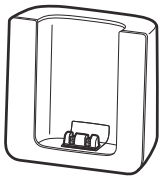
W: White Version
(for USA)



KX-PRWA13
(Handset)



KX-PRW130
(Base Unit)



(Charger Unit)

Configuration for each model

Model No	Base Unit	Handset	Charger Unit	Expandable
KX-PRW130	1 (PRW130)	1 (PRWA13)		Up to 6
KX-PRWA13*		1 (PRWA13)	1	

*KX-PRWA13 is also an optional accessory, which contains a handset and a charger.

Panasonic

⚠ WARNING

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

IMPORTANT SAFETY NOTICE

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

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

If lead free solder was used in the manufacture of this product, the printed circuit boards will be marked PbF. Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.
When this mark does appear, please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

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

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1 Safety Precautions

1.1. For Service Technicians

- **Repair service shall be provided in accordance with repair technology information such as service manual so as to prevent fires, injury or electric shock, which can be caused by improper repair work**.
  1. When repair services are provided, neither the products nor their parts or members shall be remodeled.
  2. If a lead wire assembly is supplied as a repair part, the lead wire assembly shall be replaced.
  3. FASTON terminals shall be plugged straight in and unplugged straight out.

- **ICs and LSIs are vulnerable to static electricity.**
  When repairing, the following precautions will help prevent recurring malfunctions.
  1. Cover plastic parts boxes with aluminum foil.
  2. Ground the soldering irons.
  3. Use a conductive mat on worktable.
  4. Do not grasp IC or LSI pins with bare fingers.

2 Warning

2.1. Battery Caution

Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.

Attention:

A nickel metal hydride battery that is recyclable powers the product you have purchased.
Please call 1-800-8-BATTERY (1-800-822-8837) for information on how to recycle this battery.

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

Note:

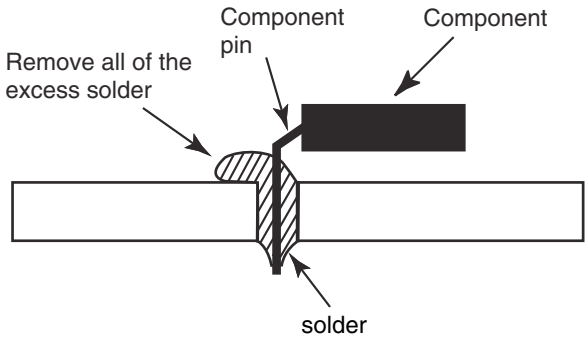
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

We will use PbF solder when discussing the lead free solder used in our manufacturing process which is made from Tin (Sn), Silver (Ag), and Copper (Cu).

This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder.

Caution

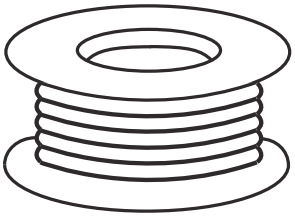
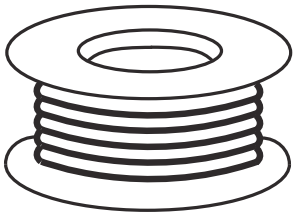
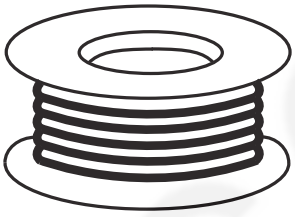
- PbF solder has a melting point that is 50 °F ~ 70 °F (30 °C ~ 40 °C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700 °F ± 20 °F (370 °C ± 10 °C).
- Exercise care while using higher temperature soldering irons.:
  Do not heat the PCB for too long time in order to prevent solder splash or damage to the PCB.
- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100 °F (600 °C).
- When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See the figure below).



(Slice View)

2.2.1. Suggested PbF Solder

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper (Sn+Ag+Cu), you can also use Tin and Copper (Sn+Cu) or Tin, Zinc, and Bismuth (Sn+Zn+Bi). Please check the manufacturer's specific instructions for the melting points of their products and any precautions for using their product with other materials.
The following lead free (PbF) solder wire sizes are recommended for service of this product: 0.3 mm, 0.6 mm and 1.0 mm.

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

2.3. Discarding of P.C. Board

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

3 Specifications

■ **Standard:**
DECT 6.0 (Digital Enhanced Cordless Telecommunications 6.0)
Wi-Fi (IEEE 802.11 b/g/n)

■ **Number of channels:**
60 Duplex Channels

■ **Frequency range:**
DECT:
1.92 GHz to 1.93 GHz
Wi-Fi:
2.412 GHz to 2.462 GHz (channels 1 to 11)

■ **Duplex procedure:**
TDMA (Time Division Multiple Access)

■ **Channel spacing:**
1,728 MHz

■ **Bit rate:**
1,152 kbit/s

■ **Modulation:**
GFSK (Gaussian Frequency Shift Keying)

■ **RF transmission power:**
DECT:
115 mW (max.)
Wi-Fi:
100 mW (peak transmission power)

■ **Voice coding:**
ADPCM 32 kbit/s

	Base Unit	Portable	Charger
Power source	AC Adaptor (PNLV236Z, 120 V AC, 60 Hz)	Rechargeable Ni-MH battery AAA (R03) size (1.2 V 550 mAh)	AC Adaptor (PNLV233Z, 120 V AC, 60 Hz)
Receiving Method	Super Heterodyne	Super Heterodyne	——
Oscillation Method	PLL synthesizer	PLL synthesizer	——
Detecting Method	Quadrature Discriminator	Quadrature Discriminator	——
Tolerance of OSC Frequency	10.368 MHz ± 83 Hz	10.368 MHz ± 83 Hz	——
Modulation Method	Frequency Modulation	Frequency Modulation	——
ID Code	40 bit	40 bit	——
Ringer Equivalence No. (REN)	1.0B	——	——
Dialing Mode	Tone (DTMF)/Pulse	Tone (DTMF)/Pulse	——
Redial	Up to 48 digits	Up to 48 digits	——
Speed Dialer	Up to 24 digits (Phonebook)	Up to 24 digits (Phonebook)	——
Power Consumption	Standby: Approx. 1.5 W Maximum: Approx. 3.9 W	7 days at Standby, 11 hours at Talk	Standby: Approx. 0.1 W, Maximum: Approx. 2.0 W
Operating Conditions	0 °C - 40 °C (32 °F – 104 °F) 20 % – 80 % relative air humidity (dry)	0 °C - 40 °C (32 °F – 104 °F) 20 % – 80 % relative air humidity (dry)	0 °C - 40 °C (32 °F – 104 °F) 20 % – 80 % relative air humidity (dry)
Dimensions (H x W x D)	Approx. 49 mm x 165 mm x 79 mm	Approx. 145mm x 47 mm x 26 mm	Approx. 80 mm x 78 mm x 52 mm
Mass (Weight)	Approx. 160 g	Approx. 110 g	Approx. 70 g

Note:pcm
- Design and specifications are subject to change without notice.

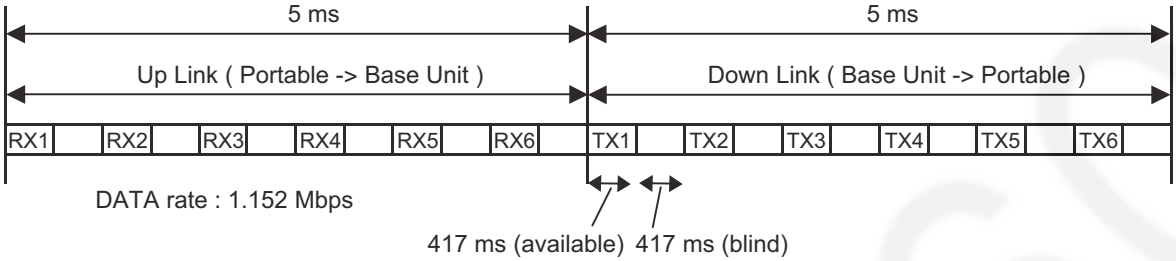
Note for Service:
- **Operation range:** Up to 300 m outdoors, Up to 50 m indoors, depending on the condition.
- **Analog telephone connection:** Telephone Line
- **T-adaptor:** KX-J66
- **Optional DECT repeater:** KX-TGA405
- **Optional key detector:** KX-TGA20

4 Technical Descriptions

4.1. US-DECT Description

The frequency range of 1.92 GHz-1.93 GHz is used. Transmitting and receiving carrier between base unit and Portable is same frequency. Refer to **Frequency Table** (P.60).

4.1.1. TDD Frame Format

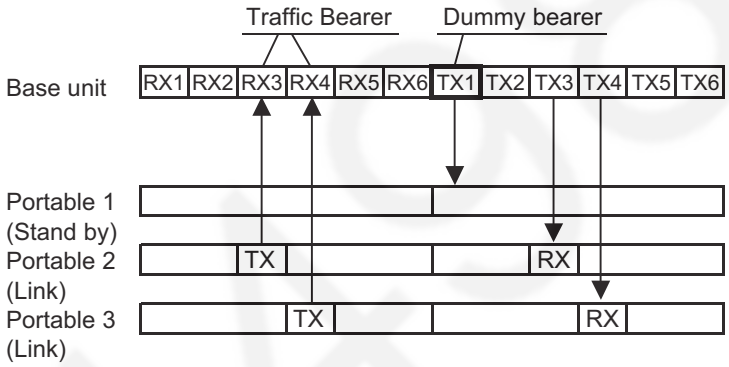


4.1.2. TDMA system

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

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

• **2 - Portables Link**



Traffic Bearer

A link is established between base unit and Portable.

The state where duplex communication is performed.

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

Dummy Bearer

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

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

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

Note:

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

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

4.1.3. Signal Flowchart in the Radio Parts

Reception

Base unit:

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

Portable:

As for a portable RF, RF signal is received in one antenna.
BBIC down-converts to 864 kHz IF signal from RX signal and demodulates it to digital data "RXDATA".
BBIC (IC1) converts RXDATA into a voice signal and outputs it to speaker.

Transmission

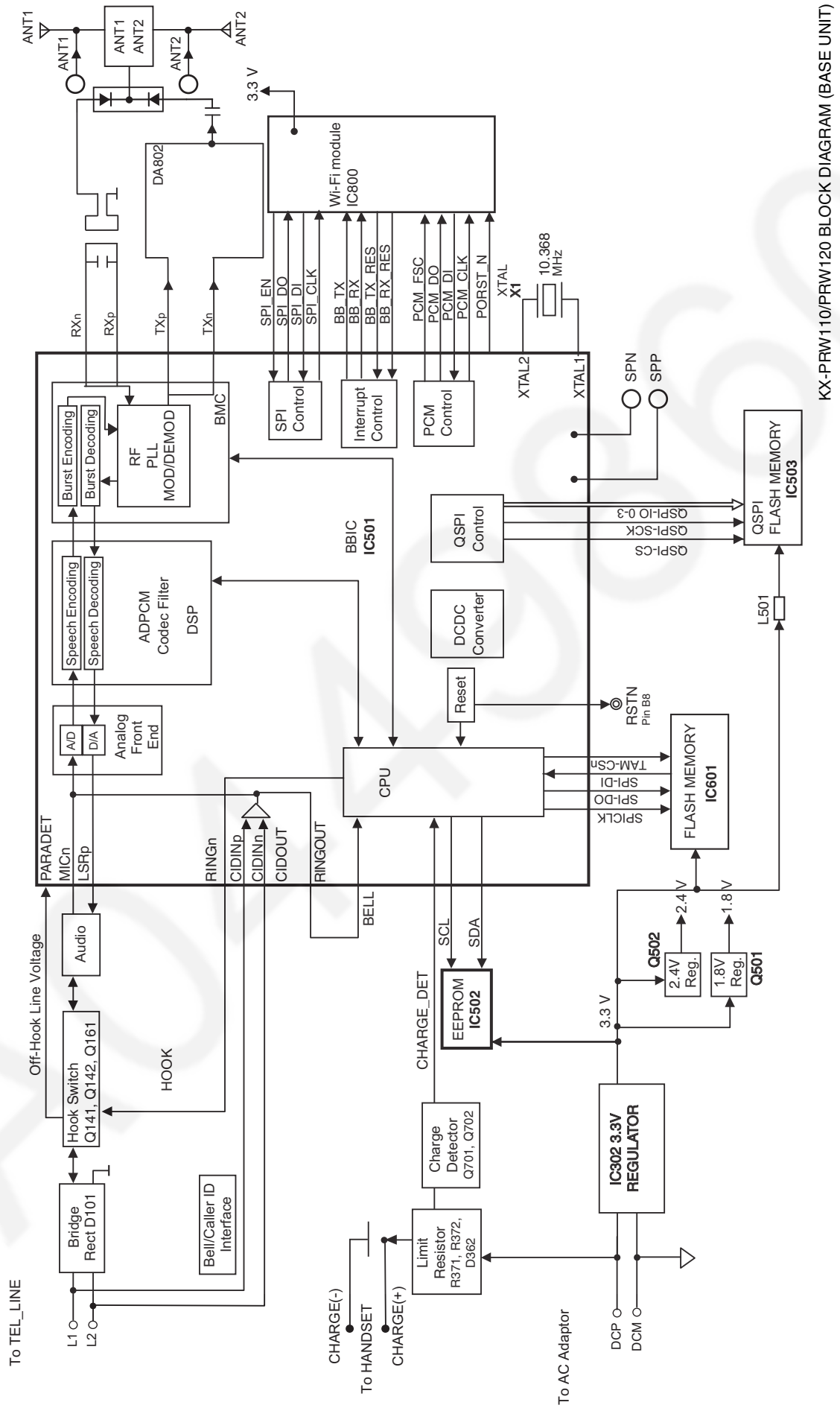
Portable:

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

Base unit:

As for a base unit RF, RF signal is received in two antennas.
BBIC (IC501) compares RF signal levels and selects the antenna to be used. Then BBIC down-converts to 864 kHz IF signal from RX signal in the selected antenna, and demodulates it to digital data "RXDATA".
BBIC (IC501) converts RXDATA into a voice signal and outputs it to TEL line.

4.2. Block Diagram (Base Unit)



4.3. Circuit Operation (Base Unit)

4.3.1. Outline

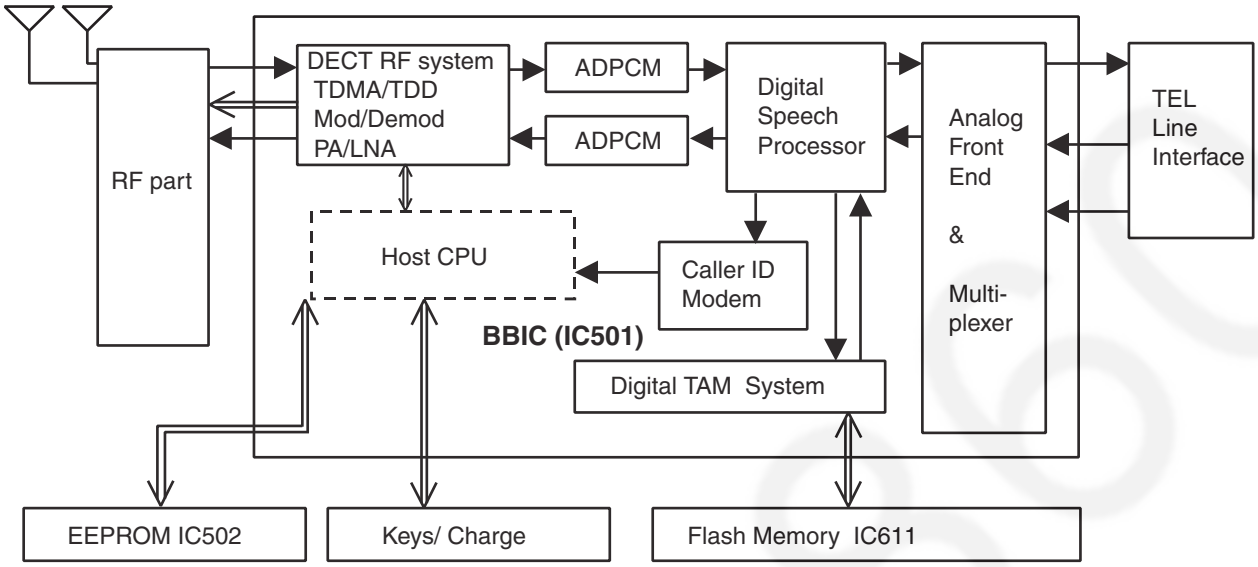
Base Unit consists of the following ICs as shown in **Block Diagram (Base Unit)** (P.10).

- DECT BBIC (**B**ase **B**and IC): IC501
  - Handling all the audio, signal and data processing needed in a DECT base unit
  - Controlling the DECT specific physical layer and radio section (**B**urst **M**odule **C**ontroller section)
  - ADPCM code filter for speech encoding and speech decoding (DSP section)
  - Echo-cancellation and Echo-suppression (DSP section)
  - Any tones (tone, sidetone, ringing tone, etc.) generation (DSP section)
  - DTMF receiver (DSP section)
  - Clock Generation for RF Module
  - ADC, DAC, timer, and power control circuitry
  - PLL Oscillator
  - Detector
  - Compress/Expander
  - First Mixer
  - All interfaces (ex: QSPI FLASH MEMORY, EEPROM, LED, Analog Front End, etc.)
  - Integrated 1.9GHz PA for DECT
  - SP-Phone
  - TAM-Counter
- EEPROM: IC502
  - Temporary operating parameters (for RF, etc.)
- FLASH MEMORY: IC611
  - Voice Prompt (TAM) D/L Area
  - ICM/OGM Recording Area
- Additionally,
  - Power Supply Circuit (+3.0 V, +1.8 V output)
  - Crystal Circuit (10.368 MHz)
  - Charge Circuit
  - Telephone Line Interface Circuit
- QSPI FLASH MEMORY IC503
  - Main Program D/L Area
- Wi-Fi module : IC800
  - Handling the audio, signal and data processing related to Wi-Fi.
  - Support IEEE802.11b/11g/11n.
  - Controlling the connection with the smartphone application.
  - Power Supply Circuit (+1.5V output).

4.4. Circuit Operation (Base Unit)

General Description:

(BBIC, Flash Memory, EERROM) is a digital speech/signal processing system that implements all the functions of speechcom-pression, record and playback, and memory management required in a digital telephone answering machine.The BBIC system is fully controlled by a host processor. The host processor provides activation and control of all that functionsas follows.



4.4.1. BBIC (Base Band IC: IC501)

- **Voice Message Recording/Play back**
  The BBIC system uses a proprietary speech compression technique to record and store voice message in Flash Memory.An error correction algorithm is used to enable playback of these messages from the Flash Memory.
- **DTMF Generator**
  When the DTMF data from the handset is received, the DTMF signal is output.
- **Synthesized Voice (Pre-recorded message)**
  The BBIC implements synthesized Voice, utilizing the built in speech detector and a Flash Memory, which stored the vocabulary.
- **Caller ID demodulation**
  The BBIC implements monitor and demodulate the FSK/DTMF signals that provide CID information from the Central Office.
- **Digital Switching**
  The voice signal from telephone line is transmitted to the handset or the voice signal from the handset is transmitted to theTele-phone line, etc. They are determined by the signal path route operation of voice signal.
- **Block Interface Circuit**
  RF part, Key scan, Telephone line.

4.4.2. Flash Memory (IC611)

Following information data is stored.

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

4.4.3. EEPROM (IC502)

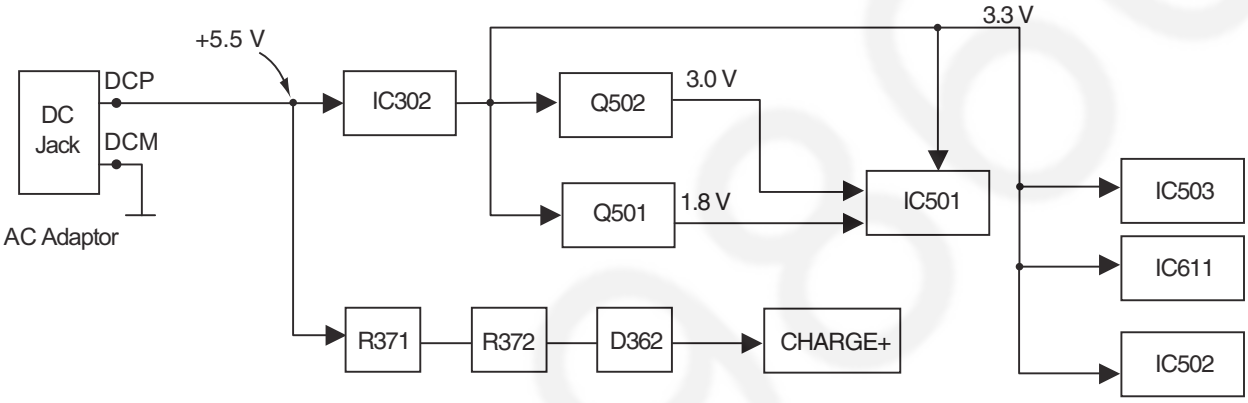
Following information data is stored.

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

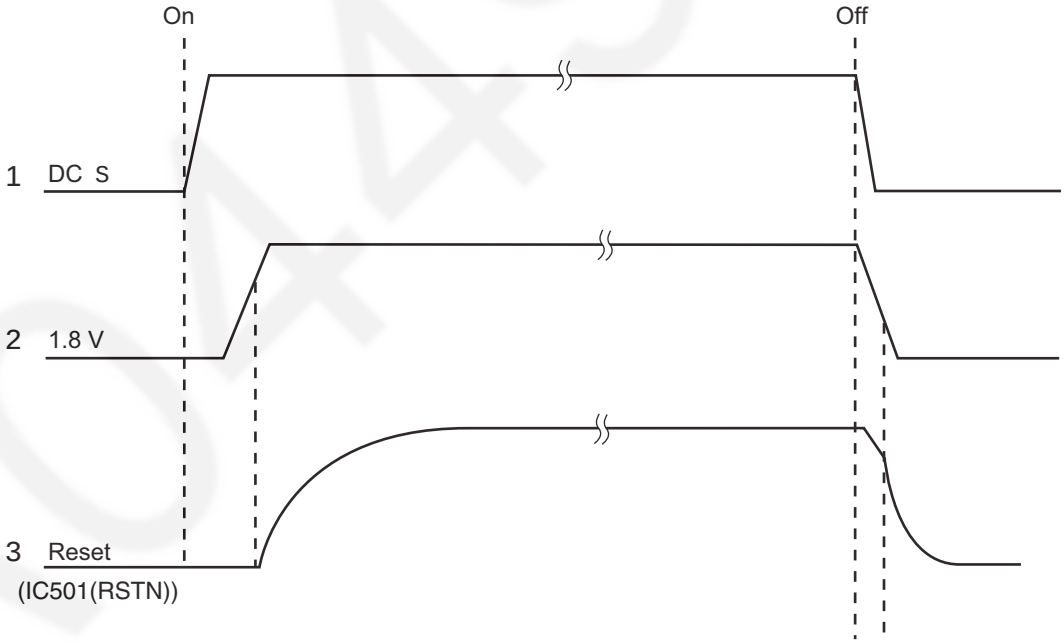
4.4.4. Power Supply Circuit

The power is supplied to the DECT BBIC, QSPI FLASH MEMORY, FLASH MEMORY, EEPROM and Charge Contact from AC Adaptor (+5.5 V) as shown in Fig.101. The power supply is as follows;

- DECT BBIC (IC501):
  DC Jack (+5.5 V) → IC302 → IC501
  DC Jack (+5.5 V) → IC302 → Q502 → IC501
  DC Jack (+5.5 V) → IC302 → D501 → Q501 → IC501
- EEPROM (IC502):
  DC Jack (+5.5 V) → IC302 → IC501→ IC502
- FLASH MEMORY (IC611)
  DC Jack (+5.5 V) → IC302→ IC501→ IC611
- Charge Contact (CHARGE+):
  DC Jack (+5.5 V) → R371 → R372 → D362→ CHARGE+
- QSPI FLASH MEMORY (IC503):
  DC Jack (+5.5 V) → IC302 → IC501 → IC503



<Fig.101>



4.4.5. Telephone Line Interface

<Function>

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

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

In the standby mode, Q141 is open to cut the DC loop current and decrease the ring load.

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

- B → P101 → C104 → R102 → IC501 (CID INp)
  ↓→C106 → R104 →↑
- A → C103 → R101 → IC501 (CID INn)
  ↓→C105 → R103 →↑

ON/OFF hook circuit:

In the standby mode, Q104 is open, and connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an **on-hook condition**.

When IC501 detects a ring signal or press the TALK Key onto the handset, Q142 turns on and then Q141 turns on, thus providing an **off-hook condition** (DC current flows through the circuit) and the following signal flow makes the loop current.

- B → P101 →D101 → Q141 → Q161 → R163 → D101 → A

4.4.6. Transmitter/Receiver

- Audio Circuits and DTMF tone signal circuits.

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

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

Signal Path:

*Refer to **Signal Route** (P.19).

4.4.6.1. Transmitter Block

The voice signal input from the TEL LINE interface goes to DECT BBIC (IC501) as shown in **Block Diagram (Base Unit)** (P.10)

The voice signal passes through the analog part of IC501 where it is amplified and converted to a digital audio stream signal.

The burst switch controller processes this stream performing encryption and scrambling, adding the various other fields to produce the GAP (**G**eneric **A**ccess **P**rofile) standard DECT frame, assigning to a time slot and channel etc.

In IC501, the carrier frequency is changing, and frequency modulated RF signal is generated.In IC501,RF signal is amplified, and radiated from antenna. Handset detects the voice signal or data signal in the circuit same as the following explanation of Receiver Block.

4.4.6.2. Receiver Block

The signal of 1900 MHz band (1921.536 MHz ~ 1928.448 MHz) which is input from antenna is input to IC501 as shown in **Block Diagram (Base Unit)** (P.10).

In IC501, the signal of 1900 MHz band is downconverted to 864 kHz signal and demodulated, as GAP (**G**eneric **A**ccess **P**rofile) standard DECT frames. It passes through the decoding section burst switch controller where it separates out the frame information and performs de-encryption and de-scrambling as required. It then goes to the DSP section where it is turned back into analog audio. This is amplified by the analog front end, and goes to the TEL LINE Interface.

4.4.7. WiFi Module

BBIC and WiFi module are connected with 3group signals as shown in **Block Diagram (Base Unit)** (P.10).

SPI (Serial Peripheral Interface) Control --- Control the data (except Audio data) between BBIC and Wi-Fi module

Interrupt Control --- Control the timing of sending/receiving of BBIC and Wi-Fi module

PCM (Pulse Code Modulation) Control --- Control the Audiol data between BBIC and Wi-Fi module.

When turning ON, it start to communicate between BBIC and WiFi module by SPI Control with Interrupt control to set various data into the register of WiFi module and then it becomes Stand-by status.

WiFi network data, such as MAC address is transferred to Memory of WiFi module from BBIC's one.

For talk with Smartphone via WiFi, audio signal is modified to PCM signal then communicated.

4.4.8. Parallel Connection Detect Circuit/Auto Disconnect Circuit

Function:

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

Circuit Operation:

Parallel connection detection when on hook:

When on hook, the voltage is monitored at pin (N1), (N2) of IC501. There is no parallel connection if the voltage is 0.54 V or higher, while a parallel connection is deemed to exist if the voltage is lower.

Parallel connection detection when off hook:
When off hook, the voltage is monitored at pin (F2) of IC501; the presence/absence of a parallel connection is determined by detecting the voltage changes.
If the Auto disconnect function is ON and statuses are Hold, receiving ICM, OGM transmitting, BBIC disconnects the line after detecting parallel connection is off hook.

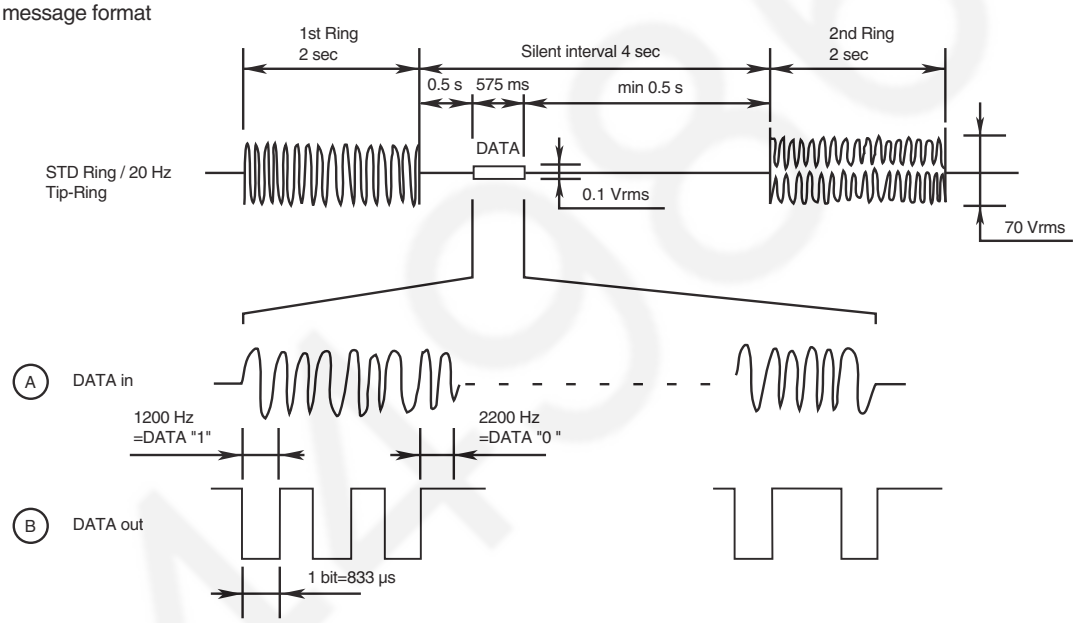
4.4.9. Calling Line Identification (Caller ID)/Call Waiting Caller ID

Function:

Caller ID

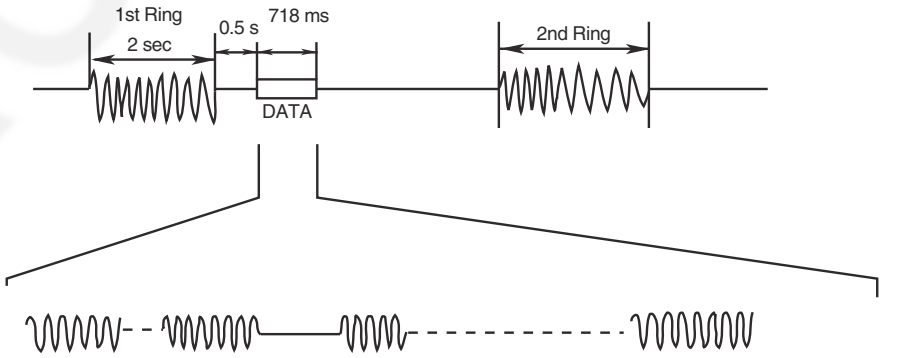
The caller ID is a chargeable ID which the user of a telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation of this circuit assumes that a caller ID service contract has been entered for the circuit being used. The data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

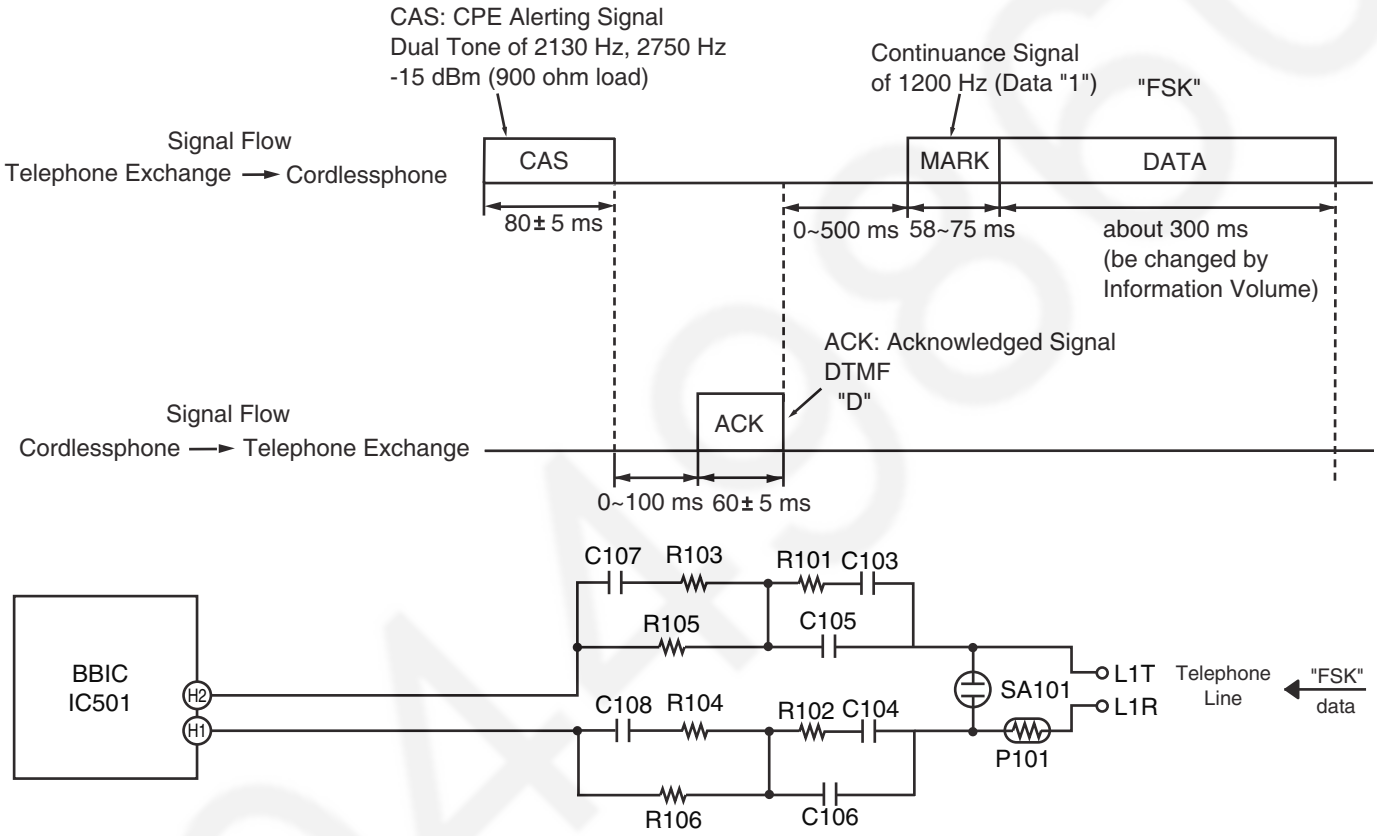
Function:

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.

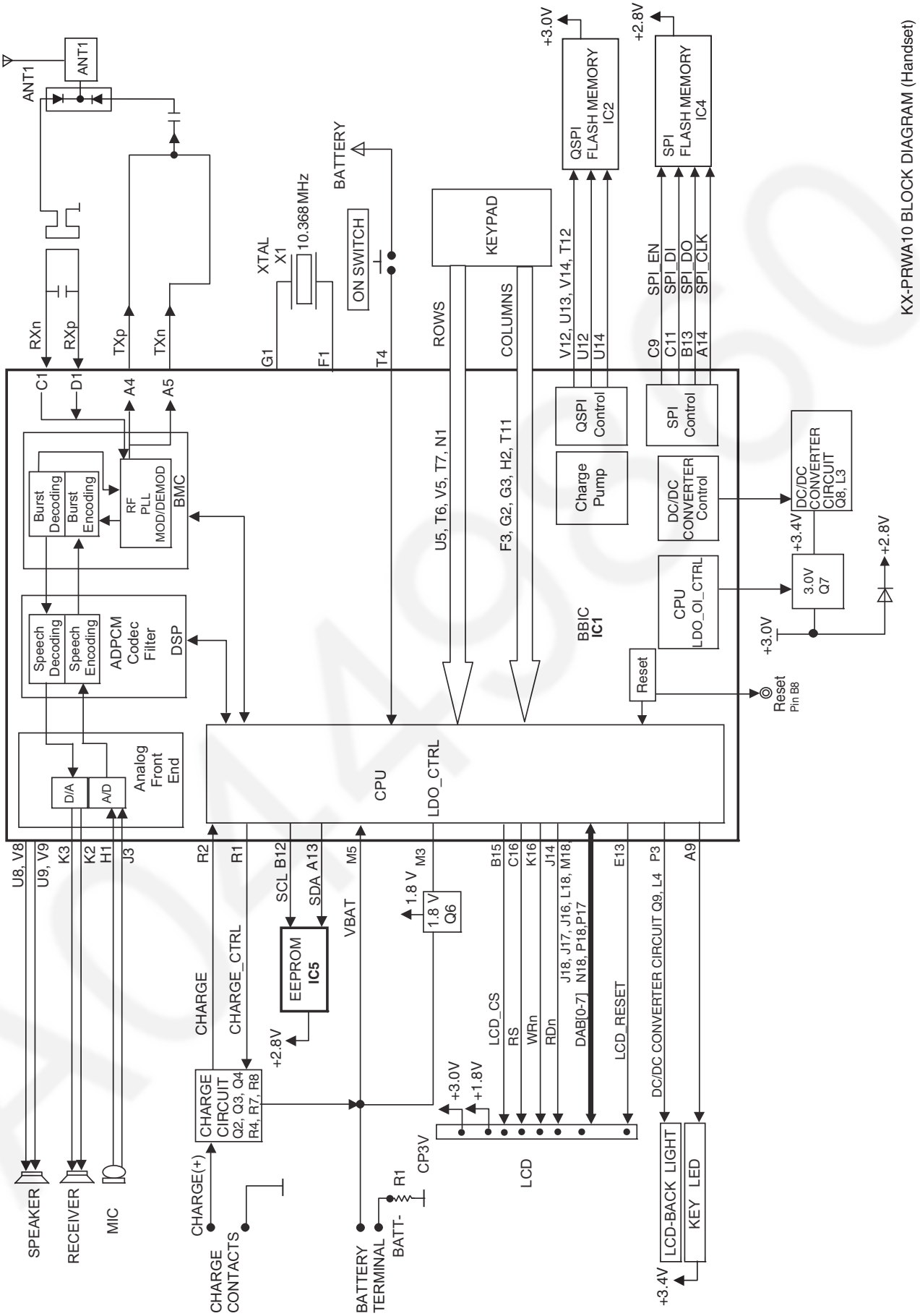
Telephone Line → P101 → C103, R101, C105, R103, C107, R105, C104, R102, C106, R104, C108, R106 → IC501 (H2, H1).

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 display.

Call Waiting Format



4.5. Block Diagram (Handset)



4.6. Circuit Operation (Handset)

4.6.1. Outline

Handset consists of the following ICs as shown in **Block Diagram (Handset)** (P.17).

- DECT BBIC (**B**ase **B**and IC): IC1
  - All data signals (forming/analyzing ACK or CMD signal)
  - All interfaces (ex: Key, Detector Circuit, Charge, DC/DC Converter, EEPROM, LCD, RF Power Amp.)
  - PLL Oscillator
  - Detector
  - Compress/Expander
  - Reception
  - Integrated 1.9 GHz PA for DECT
- QSPI FLASH MEMORY: IC2
  - Main Program D/L Area
- EEPROM: IC5
  - Temporary operating parameters (for RF, etc.)
- SPI FLASH MEMORY: IC4
  - Wall paper, Ringer Tone D/L Area.

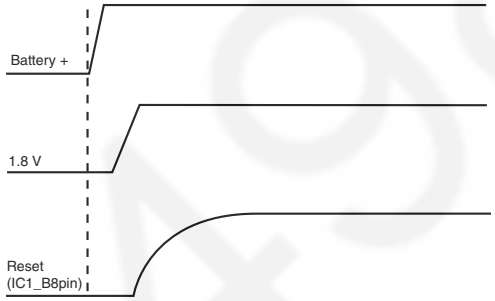
4.6.2. Power Supply Circuit/Reset Circuit

Circuit Operation:

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

BATTERY(2.2 V ~ 2.6 V: BATT+) → F1 → L3 → Q8 → Q6 (1.8 V), Q7 (3.0V)

The Reset signal generates IC1 (B8 pin) and 1.8 V.



4.6.3. Charge Circuit

Circuit Operation:

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

DC+(5.5 V) → R371 → R372 → D362 → CHARGE+(Base) → CHARGE+(Handset) → [Q3 / R4] → Q2 → F1 → BATTERY+...

Battery...

BATTERY- → R1→ GND → CHARGE-(Handset)→ CHARGE-(Base) → GND → DC-(GND)

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

The charge current is controlled by switching Q4 of Handset.

Refer to Fig.101 in **Power Supply Circuit** (P.13).

4.6.4. Battery Low/Power Down Detector

Circuit Operation:

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

The detected voltage is as follows;

- Battery Low

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

  The BBIC detects this level and "▭" starts flashing.
- Power Down

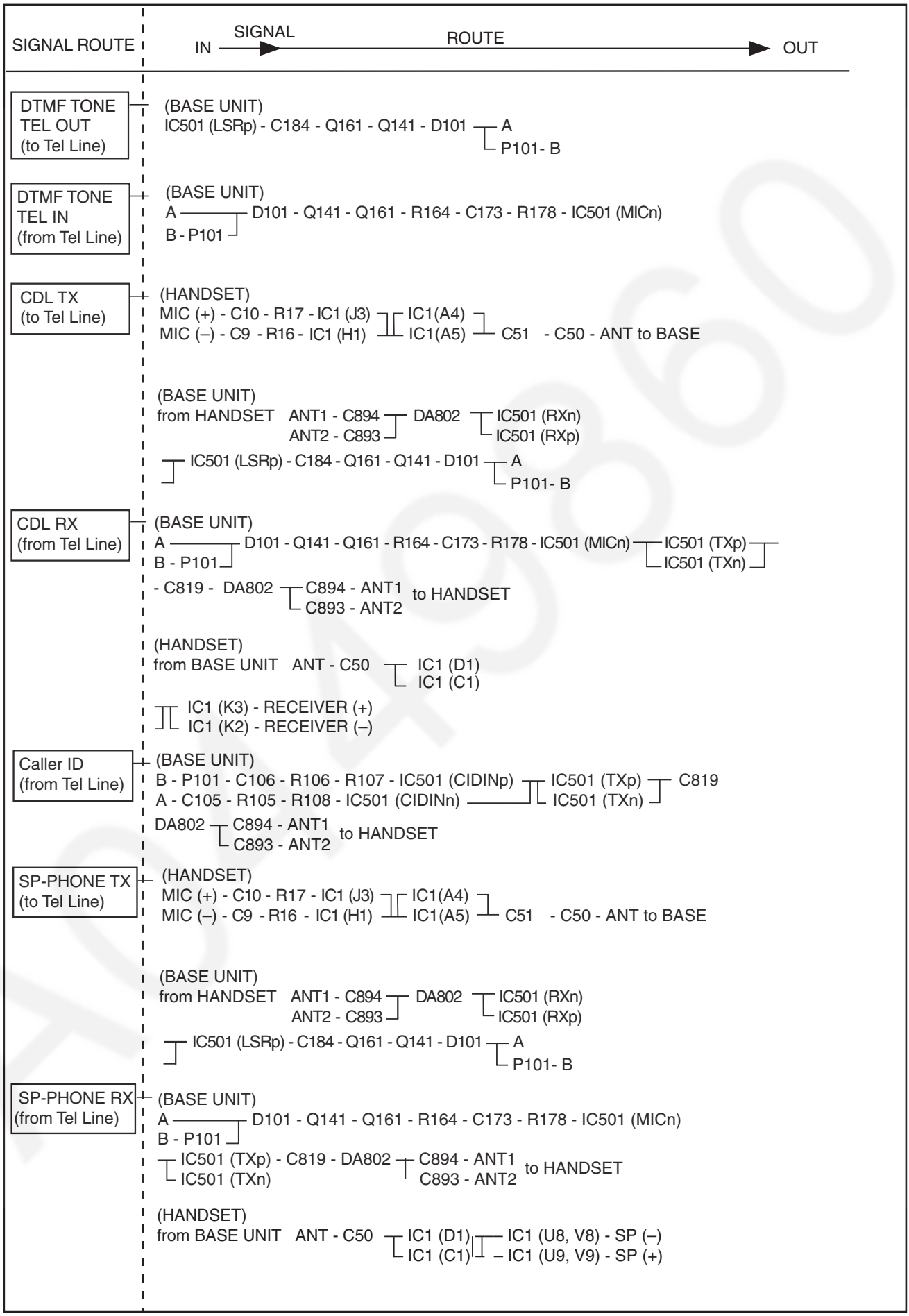
  Battery voltage: V(Batt) ≦ 2.0 V ± 50 mV

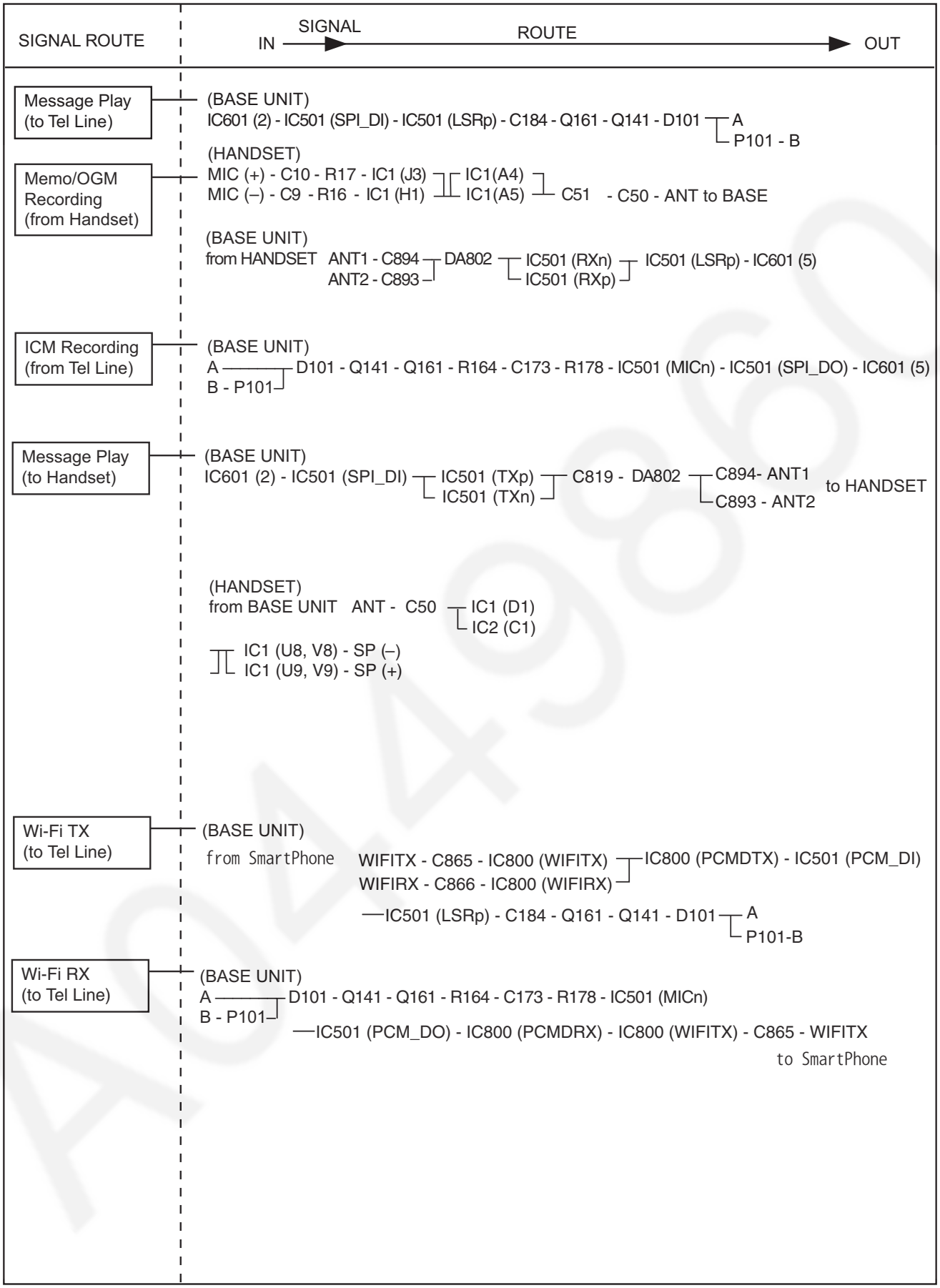
  The BBIC detects this level and power down.

4.6.5. Speakerphone

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

4.7. Signal Route




SIGNAL ROUTE
SIGNAL
IN
ROUTE
OUT
Message Play (to Tel Line)
(BASE UNIT)
IC601 (2) - IC501 (SPI_DI) - IC501 (LSRp) - C184 - Q161 - Q141 - D101 - A
P101 - B
Memo/OGM Recording (from Handset)
(HANDSET)
MIC (+) - C10 - R17 - IC1 (J3)
MIC (–) - C9 - R16 - IC1 (H1)
IC1(A4)
IC1(A5)
C51 - C50 - ANT to BASE
(BASE UNIT)
from HANDSET ANT1 - C894
ANT2 - C893
DA802
IC501 (RXn)
IC501 (RXp)
IC501 (LSRp) - IC601 (5)
ICM Recording (from Tel Line)
(BASE UNIT)
A
B - P101
D101 - Q141 - Q161 - R164 - C173 - R178 - IC501 (MICn) - IC501 (SPI_DO) - IC601 (5)
Message Play (to Handset)
(BASE UNIT)
IC601 (2) - IC501 (SPI_DI)
IC501 (TXp)
IC501 (TXn)
C819 - DA802
C894- ANT1
C893 - ANT2
to HANDSET
(HANDSET)
from BASE UNIT ANT - C50
IC1 (D1)
IC2 (C1)
IC1 (U8, V8) - SP (–)
IC1 (U9, V9) - SP (+)
Wi-Fi TX (to Tel Line)
(BASE UNIT)
from SmartPhone
WIFITX - C865 - IC800 (WIFITX)
WIFIRX - C866 - IC800 (WIFIRX)
IC800 (PCMDTX) - IC501 (PCM_DI)
IC501 (LSRp) - C184 - Q161 - Q141 - D101 - A
P101-B
Wi-Fi RX (to Tel Line)
(BASE UNIT)
A
B - P101
D101 - Q141 - Q161 - R164 - C173 - R178 - IC501 (MICn)
IC501 (PCM_DO) - IC800 (PCMDRX) - IC800 (WIFITX) - C865 - WIFITX
to SmartPhone

5 Location of Controls and Components

Refer to the Operating Instructions.

Note:

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

6 Installation Instructions

Refer to the Operating Instructions.

Note:

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

7 Operating Instructions

Refer to the Operating Instructions.

Note:

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

7.1. For Service Hint

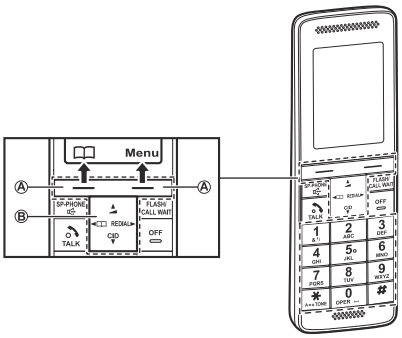
Items	Contents
Battery	You could use other rechargeable batteries sold in a market, but the unit is not guaranteed to work properly.
	The battery strength may not be indicated correctly if the battery is disconnected and connected again, even after it is fully charged. In that case, by recharging the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

8 Service Mode

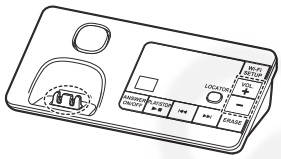
8.1. Engineering Mode

8.1.1. Base Unit

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



H/S key operation



H/S LCD

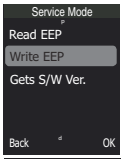
1). Press {**Menu**}.

2). Select "Settings" using {V}, {^}, {<}, or {>} then press {**Select**}.

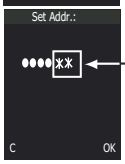
3). Select "Set tel line" using {^} or {V} then press {**Select**}.

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

5). Select "Write EEP" using {^} or {V} then press {OK}.

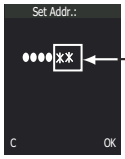


6). Enter "●", "●", "●", "●" (Address). (*1)



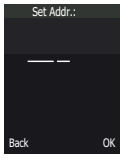
Default Data

7). Enter "＊", "＊" (New Data). (*1)



New Data

8). Press {OK}, a long confirmation beep will be heard.



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

Frequently Used Items (Base Unit)

ex.)

Items	Address	Default Data	New Data		Remarks
C-ID(FSK) sensitivity	07 5D/07 5C	00/51	00/39 (3 dB up)	00/28 (6 dB up)	When the hex change from 00/51 to 00/39 or 00/28, gain increase by 3 dB or 6 dB.
C-ID(DTMF) sensitivity	07 63/07 62	08/00	0B/4C (3 dB up)	0F/F6 (6 dB up)	When the hex change from 08/00 to 0B/FC or 0F/F6, gain increase by 3 dB or 6 dB.
SMS (FSK) receiving sensitivity	07 5D/07 5C	00/51	00/39 (3 dB up)	00/28 (6 dB up)	When hex changes from “00/51” to “00/39” or “00/28”, gain increases by 3 dB or 6 dB.
SMS (FSK) sending level	07 EE/07 EF	00/40	00/5A (3 dB up)	00/7F (6 dB up)	When hex changes from “00/40” to “00/5A” or “00/7F”, gain increases by 3 dB or 6 dB.
Frequency	00 08/00 07	04/4A	-	-	Use these items in a **READ-ONLY** mode to confirm the contents. Careless rewriting may cause serious damage to the computer system.
ID	00 02~00 06	Given value	-	-	
Bell length	03 FA	3C (6 sec) (*3)	1E (3 sec)	14 (2 sec)	This is time until bell stops ringing. (Unit: 100 msec)

Note:

(*1) Refer to **Registering a Handset to a Base Unit** in the Operating Instructions.

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

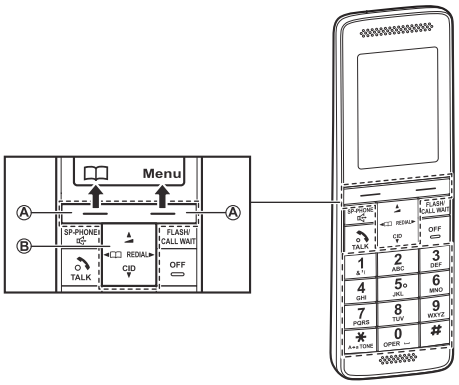
Desired Number (hex)	Input Keys	Desired Number (hex)	Input Keys
0	0	A	[R] + 0
1	1	B	[R] + 1
.	.	C	[R] + 2
.	.	D	[R] + 3
.	.	E	[R] + 4
9	9	F	[R] + 5

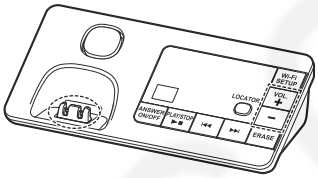
(*3)

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

8.1.2. Handset

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





H/S key operation

H/S LCD

1). Press {**Menu**}.

2). Select "Settings" using {V}, {^}, {<}, or {>} then press {**Select**}.

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

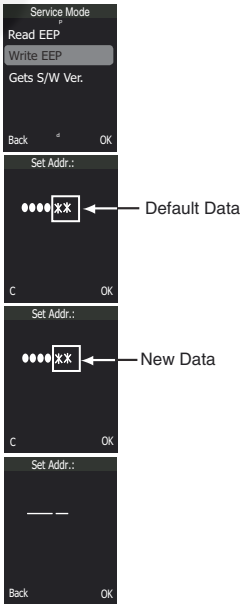
4). Select "Write EEP" using {^} or {V} then press {OK}.

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

6). Enter "＊", "＊" (New Data). (*1)

7). Press {OK}, a long confirmation beep will be heard.

8). Press【OFF】(off) to return to standby mode. After that, remove and reinsert the batteries. Press the Power button for about 1 second if the power is not turned on.



Frequently Used Items (Handset)

ex.)

Items	Address	Default Data	New Data	Possible Adjusted Value MAX (hex)	Possible Adjusted Value MIN (hex)	Remarks
Sending level	05 27	Adjusted value	Given value	FF	D0	(*2)
Receiving level	05 28	Adjusted value	Given value	FF	D0	(*3)
Battery Low	00 09	70	-	-	-	(*4)
Frequency	00 08/00 07	02/70	-	-	-	
ID	00 02~00 06	Given value	-	-	-	

Note:

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

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

(*2) When adding “01” (hex) to default value, sending level increases by 0.25 dB.

ex.)

Item	Default Data	New Data	
	E7	EB	E3
Sending level	-3 dBm	-2 dBm	-4 dBm

(*3) When reducing “01” (hex) from default value, receiving level increases by 0.25 dB.

ex.)

Item	Default Data	New Data	
	E4	E8	E0
Receiving level	-27 dBm	-26 dBm	-28 dBm

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

8.2. EEPROM LAYOUT (Handset)

8.2.1. Scope

The purpose of this section is to describe the layout of the EEPROM (IC3) for the KX-PRWA13 Handset.
The EEPROM contains hardware, software, and user specific parameters. Some parameters are set during production of the handset, some are set by the user when configuring the handset, and some during normal use of the phone.

8.2.2. Introduction

The handset uses a 64k bit serial EEPROM (IC3) for storing volatile parameters. All parameters are set up before the handset the factory. Some of these are vital for the operation of the hardware so a set of default parameters is programmed before the actual hardware fine-tuning can be initiated. This document lists all default settings with a short description.
This document lists all default parameters with a short description.

Initial Type	Description
F	The data initialized by only F command
0	The data initialized by F and 0 command
1	The data initialized by F, 0 and 1 command
2	The data initialized by F, 0, 1 and 2 command
3	The data initialized by all command (F, 0, 1, 2, 3)

Country Setting	Description
x	Default - no specific country setting, so revert to default value.

8.2.3. EEPROM contents

MMI Setting:

Address	Initial Type	Name	Description	Default value	Country Setting
04 29	3	EEP_Language	**Selected Language for LCD** GERMAN:0 ENGLISH:1 SPANISH:2 NORWEGIAN:3 FRENCH:4 ITALIAN:5 DENISH:6 DUTCH:7 SWEDISH:8 FINNISH:9 GREEK:10 TURKISH:11 HUNGARIAN:12 PORTUGUESE:13 RUSSIAN:14 POLISH:15 SLOVAKIAN:16 CZECH:17 CROATIAN:18 CATALAN:19 UKRINIAN:20 SPANISHMEX:21 SLOVENIAN:22 ESTNIAN:23 LITHUANIAN:24 LATVIAN:25 ROMANIAN:26 BULGARIAN:27 SERBIAN:28 MACEDONIAN:29 ALBANIAN:30 PORTUGUESEMEX:31 Reserve:32 HEBREW:33 ARABIC:34 PERSIA:35 HANTAI:36 HANTAI(HK):37 RUSSIAN(BX):38 BELARUS:39 KAZAKHSTAN:40 UZBEKISTAN:41 TAJIKISTAN:42 TURKMENISTAN:43 AZERBAIJAN:44 ARMENIA:45 MOLDOV:46 Reserve:47 CANADAENGLISH:48 USSPANISH:49 USFRENCH:50	0x01	0x00

MMI1 Setting:

Address	Initial Type	Name	Description	Default value	Country Setting
00 63	F	EEP_LcdContrastOffset	**LCD contrast**	0xAC	x

8.3. How to Clear User Setting

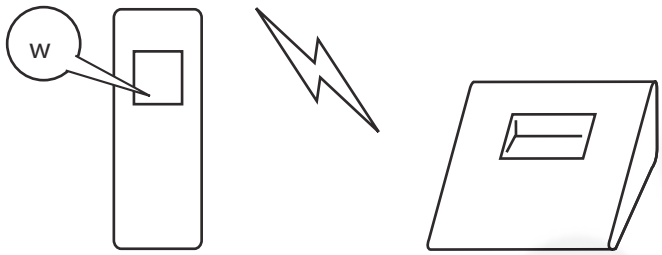
Units are reset to the Factory settings by this operation (Erase recorded Voice messages, stored Phone numbers, Caller list and etc.)

Note:

- Some menus are not reset. Refer to **Operating Instructions** (P.21).
- The reset menus differ depending on the following operations.
- **This operation should not be performed for a usual repair.**

8.3.1. Resetting both base unit and handset

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



Handset **Base unit**

1 Connect the AC adaptor to the base unit and install the charged batteries into the handset.

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

3 Lift the handset and press {OFF} to put the handset in standby mode.

4 Press 1, 4, 8 and * key of the handset simultaneously until a confirmation tone is heard.

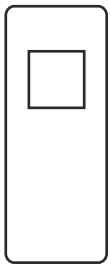
5 Disconnect the AC adaptor, then remove the battery.

Note:

(*1) Refer to **Registering a Handset to a Base Unit** in the Operating Instructions.

8.3.2. Resetting only handset

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



Handset

1 Install the charged batteries into the handset.

2 Lift the handset and press {OFF} to put the handset in standby mode.

3 Press 3, 5, 7 and # key of the handset simultaneously until a confirmation tone is heard. (*2)

4 Remove the battery.

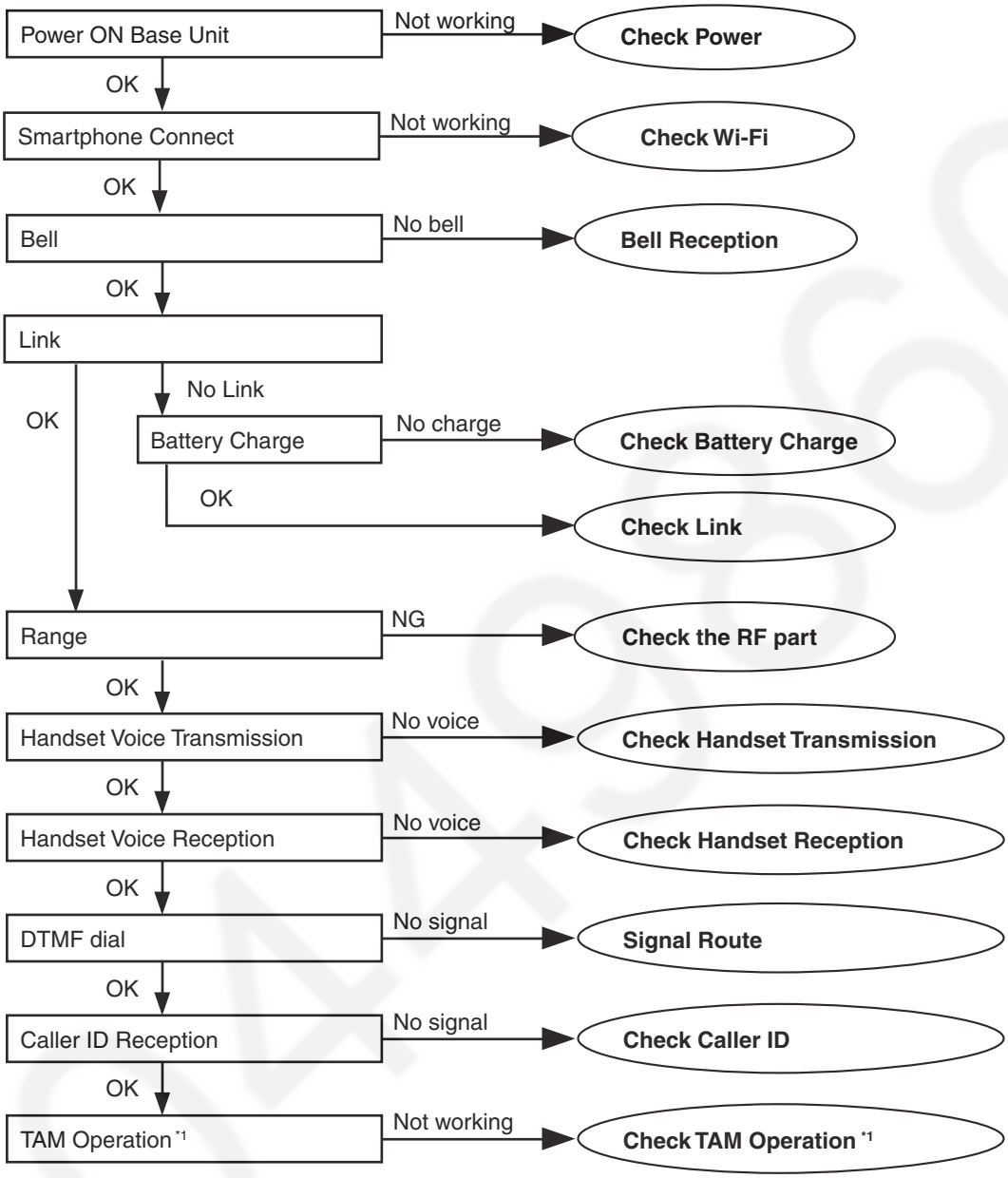
Note: (*2)

- The handset registration to the base unit is cancelled.
- If the handset needs to be registered to the base unit, refer to **Registering a Handset to a Base Unit** in the Operating Instructions.
- If users do not bring the base unit with them, the registration procedure has to be done by users themselves.

9 Troubleshooting Guide

9.1. Troubleshooting Flowchart

Flow Chart



*1 KX-PRW130

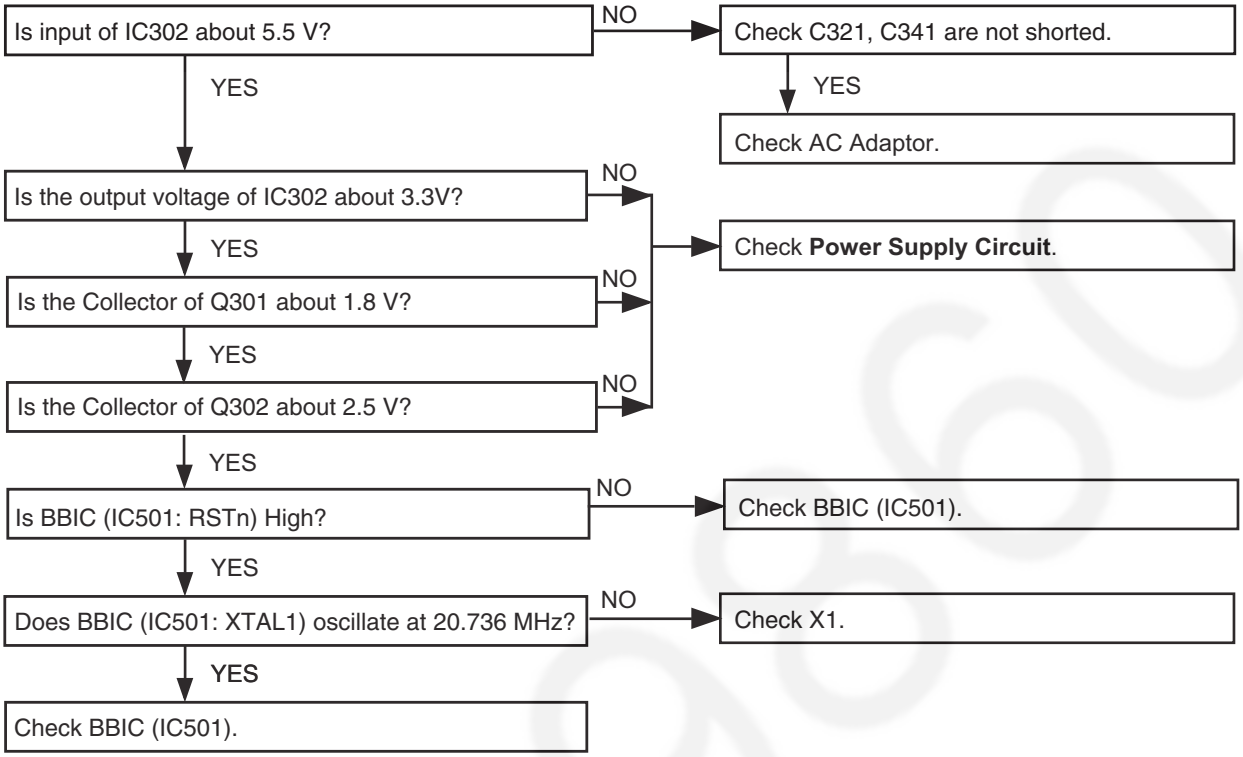
Cross Reference:

Check Power (P.29)
Check Wi-Fi (P.30)
Bell Reception (P.39)
Check Battery Charge (P.31)
Check Link (P.32)
Check the RF part (P.35)
Check Handset Transmission (P.38)
Check Handset Reception (P.38)
Signal Route (P.19)
Check Caller ID (P.38)
Check TAM Operation (P.39)

9.1.1. Check Power

9.1.1.1. Base Unit

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



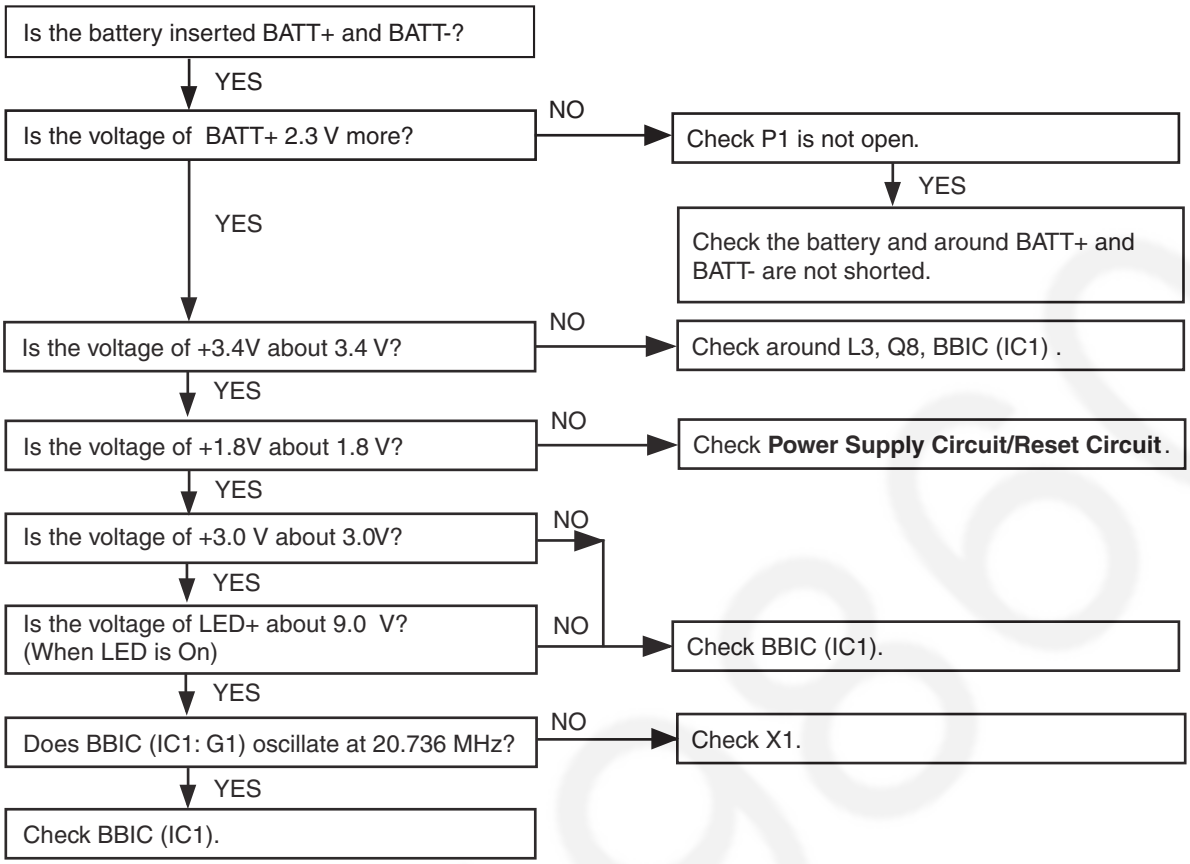
Cross Reference:

Power Supply Circuit (P.13)

Note:

(*1) Refer to **Specifications** (P.7) for part number and supply voltage of AC Adaptor.

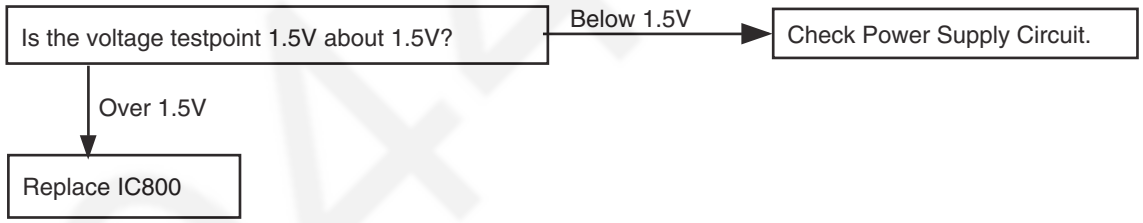
9.1.1.2. Handset



Cross Reference:
Power Supply Circuit/Reset Circuit (P.18)

9.1.2. Check Wi-Fi

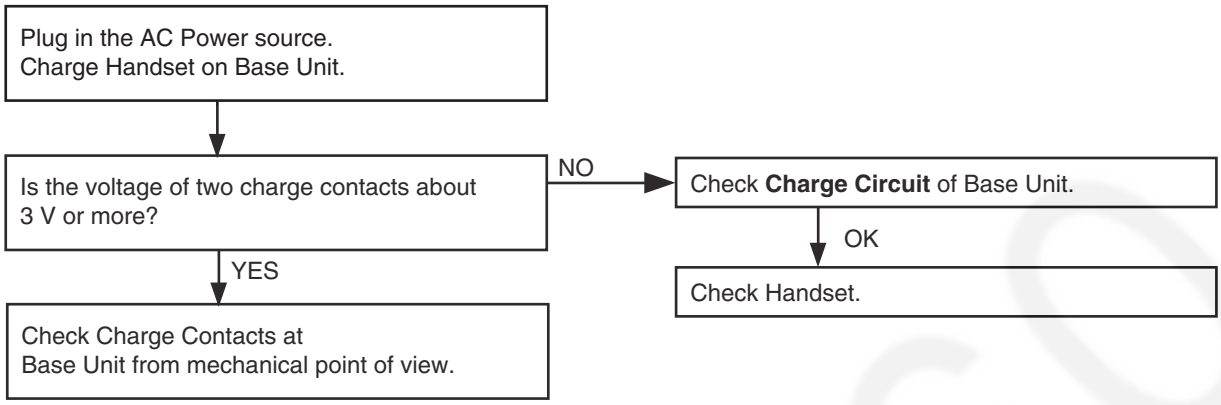
Is the AC Adaptor inserted into AC outlet?(*1)



Note:
(*1) Refer to **Specifications** (P.7) for part number and supply voltage of AC Adaptor.

9.1.3. Check Battery Charge

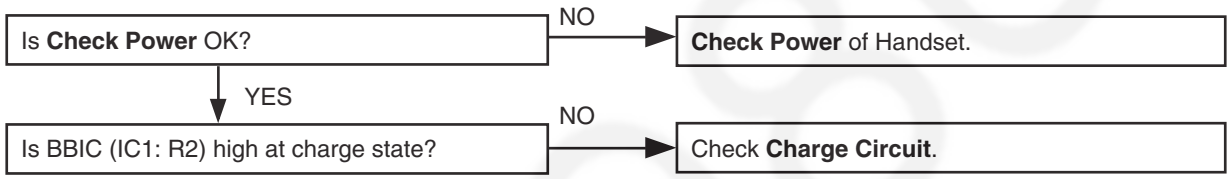
9.1.3.1. Base Unit



Cross Reference:

Charge Circuit (P.18)

9.1.3.2. Handset



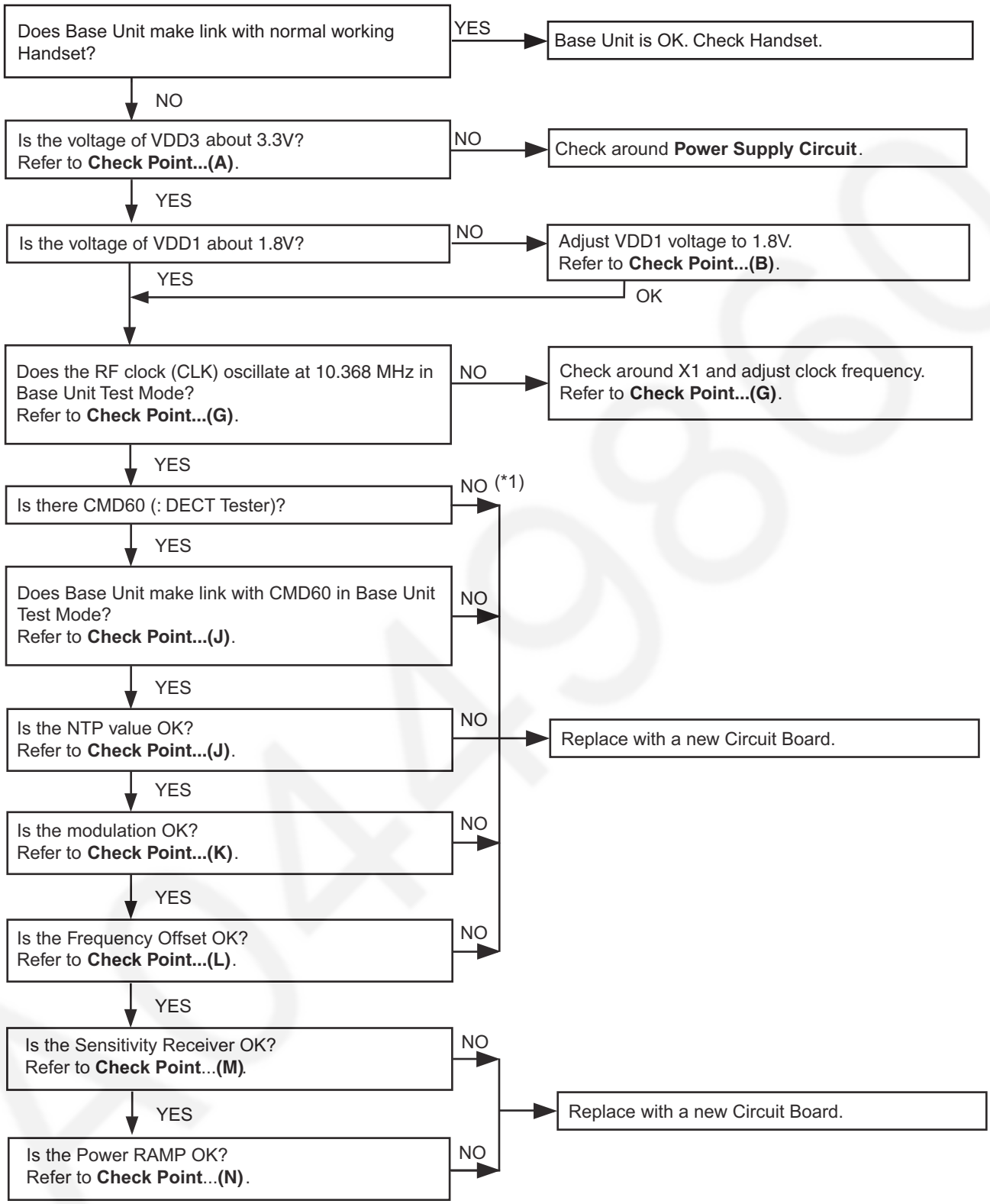
Cross Reference:

Check Power (P.29)

Charge Circuit (P.18)

9.1.4. Check Link

9.1.4.1. Base Unit



Note:

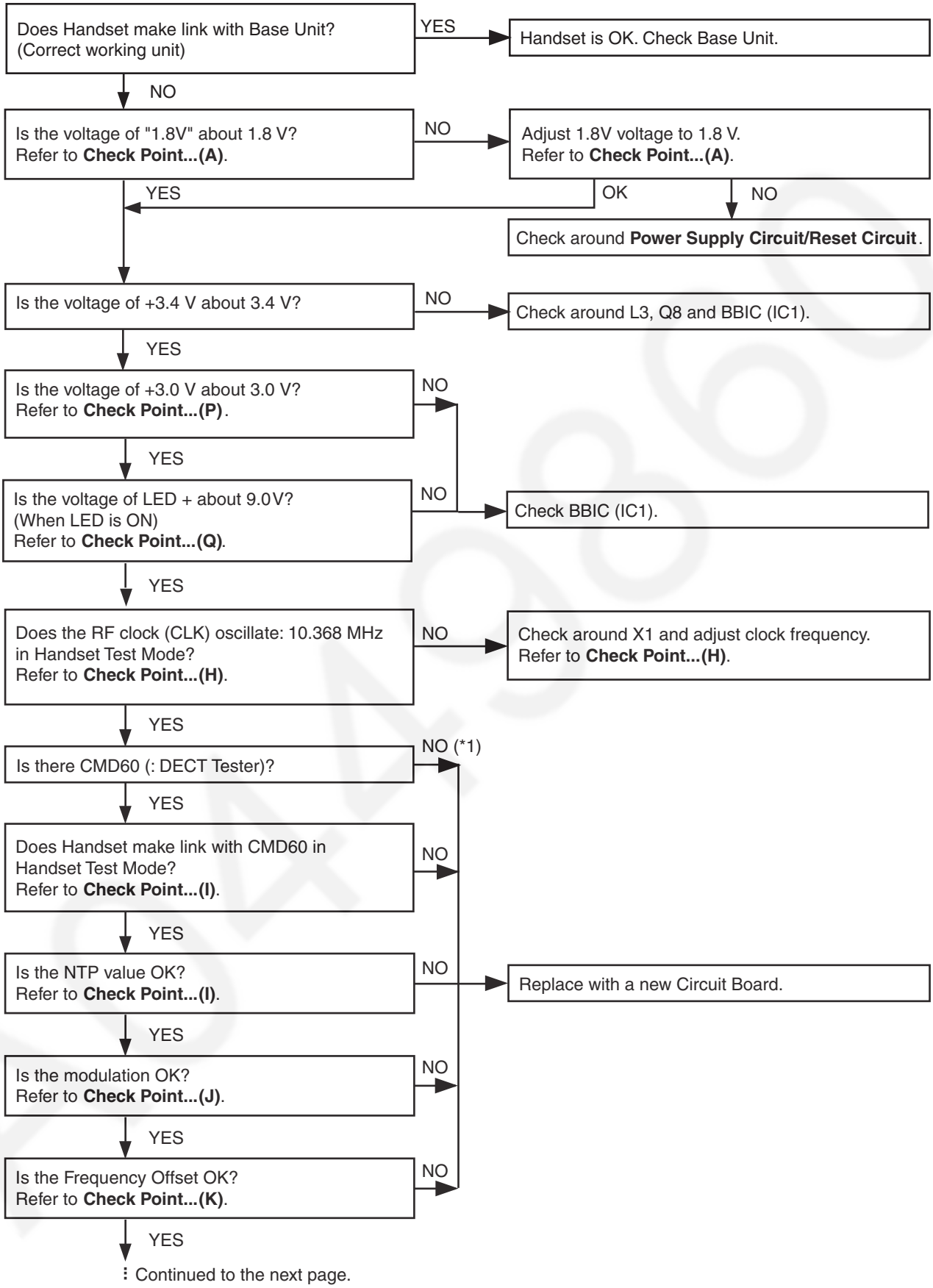
(*1) Refer to **Troubleshooting by Symptom (Base Unit and Charger Unit)** (P.40)

Cross Reference:

Check Point (Base Unit) (P.40)

Power Supply Circuit (P.13)

9.1.4.2. Handset



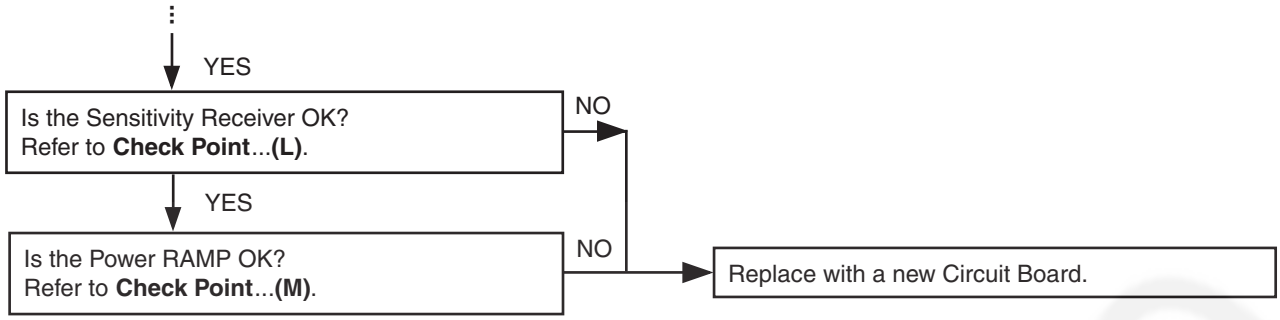
Note:

(*1) Refer to **Troubleshooting by Symptom (Handset)** (P.42)

Cross Reference:

Check Point (Handset) (P.42)

Power Supply Circuit/Reset Circuit (P.18)



Cross Reference:

Check Point (Handset) (P.42)

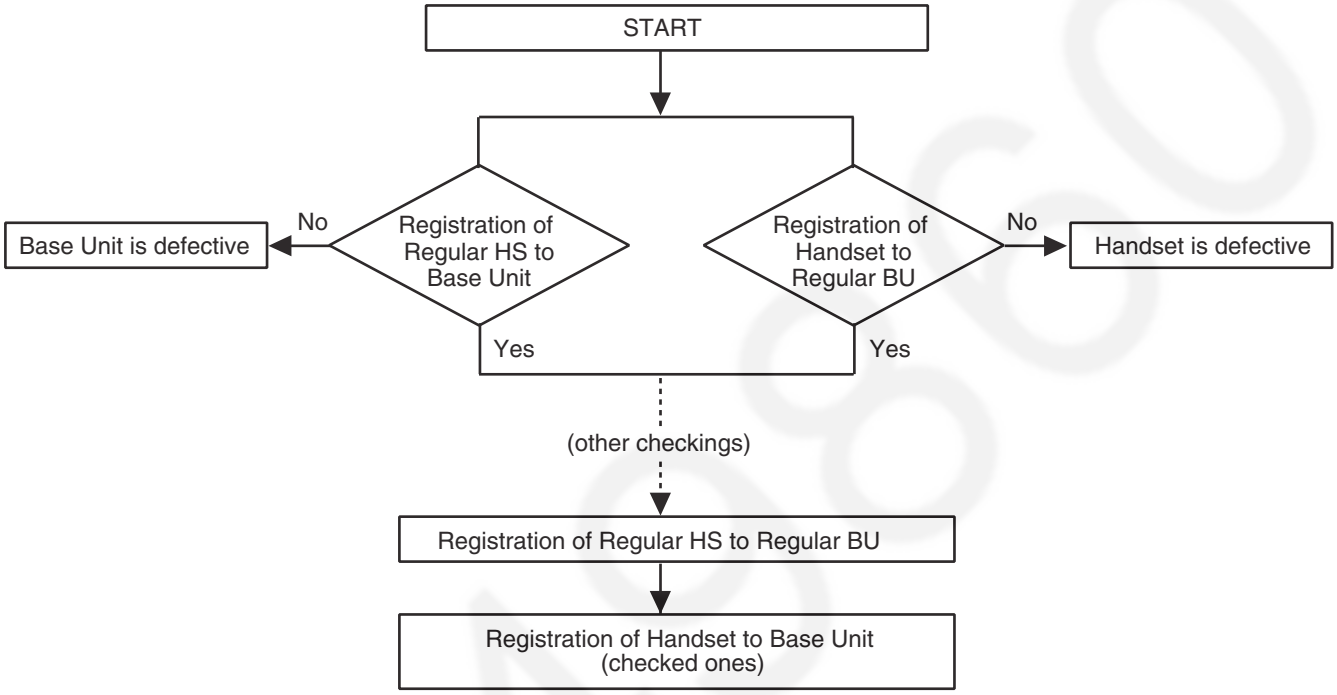
9.1.5. Check the RF part

9.1.5.1. Finding out the Defective part

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

After All the Checkings or Repairing

1. Re-register the checked Handset to the checked Base Unit, and Regular HS to Regular BU.

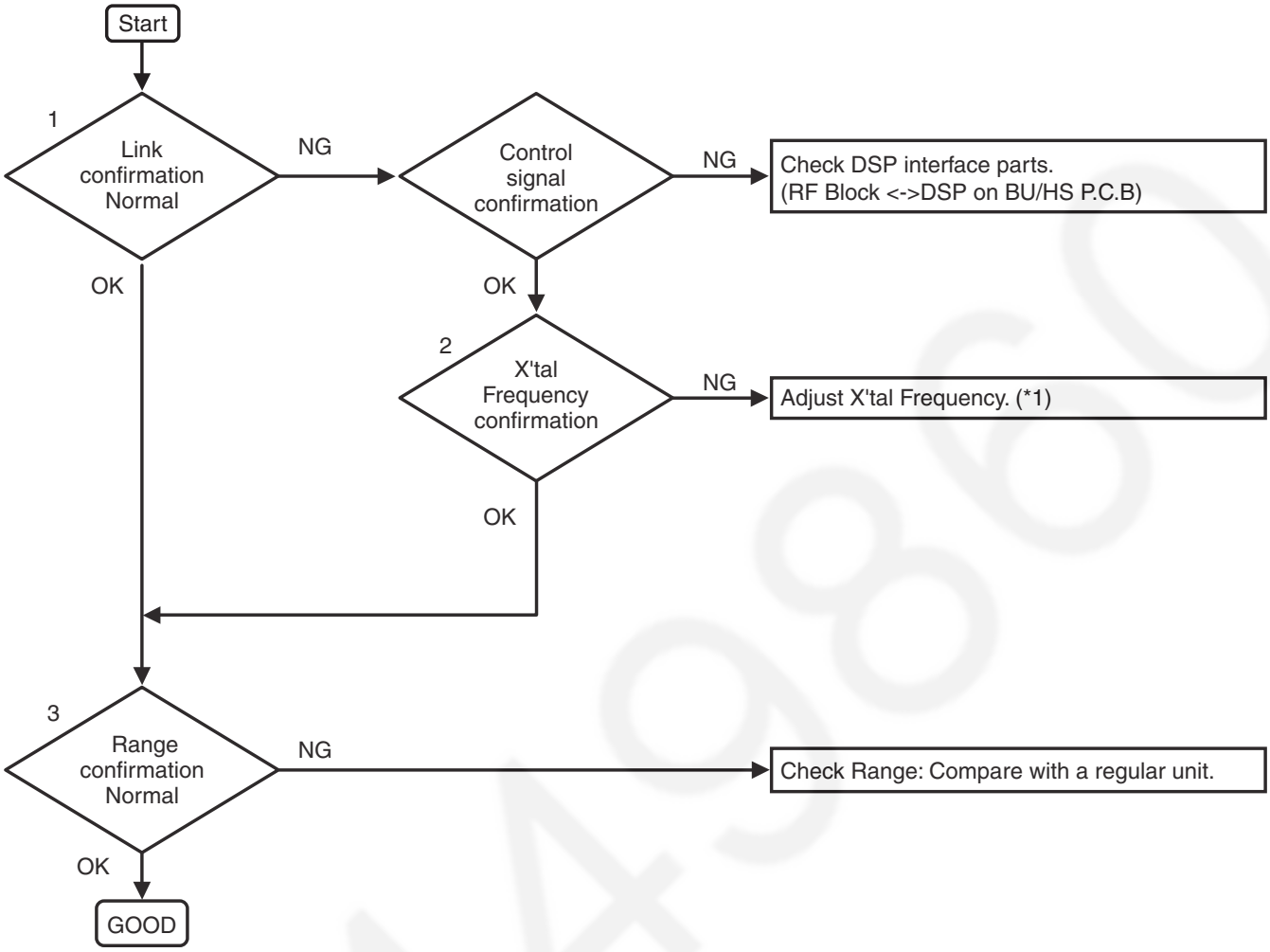


Note:

If you need to register a handset, refer to **Registering a Handset to a Base Unit** in the Operating Instructions.

9.1.5.2. RF Check Flowchart

Each item (1 ~ 3) of RF Check Flowchart corresponds to **Check Table for RF part** (P.37).
Please refer to the each item.



Note:

(*1) Base unit - refer to (E) of **Check Point (Base Unit)** (P.40)
Handset - refer to (H) of **Check Point (Handset)** (P.42)

9.1.5.3. Check Table for RF part

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

Note:

(*1) Refer to **Adjustment Standard (Base Unit)** (P.54)

(*2) Refer to **Adjustment Standard (Handset)** (P.57)

9.1.6. Check Handset Transmission

Check MIC of Handset.

↓ OK

Check CDL TX (HANDSET) in **Signal Route**.

Cross Reference:

Signal Route (P.19)

9.1.7. Check Handset Reception

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

↓ OK

Check CDL RX (HANDSET) in **Signal Route**.

Cross Reference:

How to Check the Handset Speaker or Receiver (P.61).

Signal Route (P.19)

9.1.8. Check Caller ID

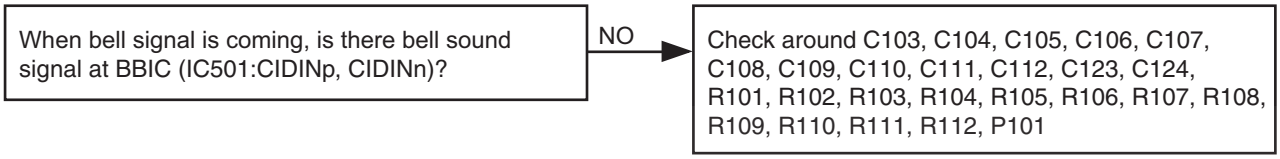
Check Caller ID in **Signal Route**.

Cross Reference:

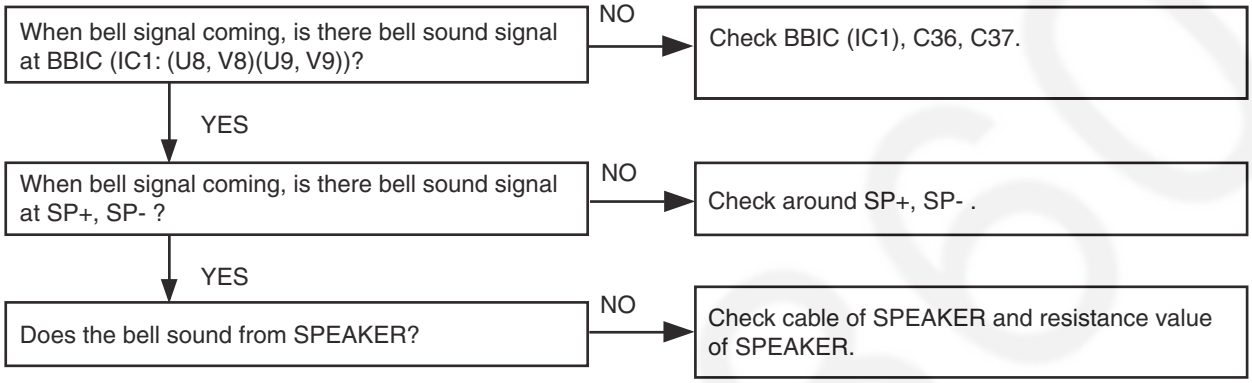
Signal Route (P.19)PNLC1047ZW

9.1.9. Bell Reception

9.1.9.1. Base Unit



9.1.9.2. Handset



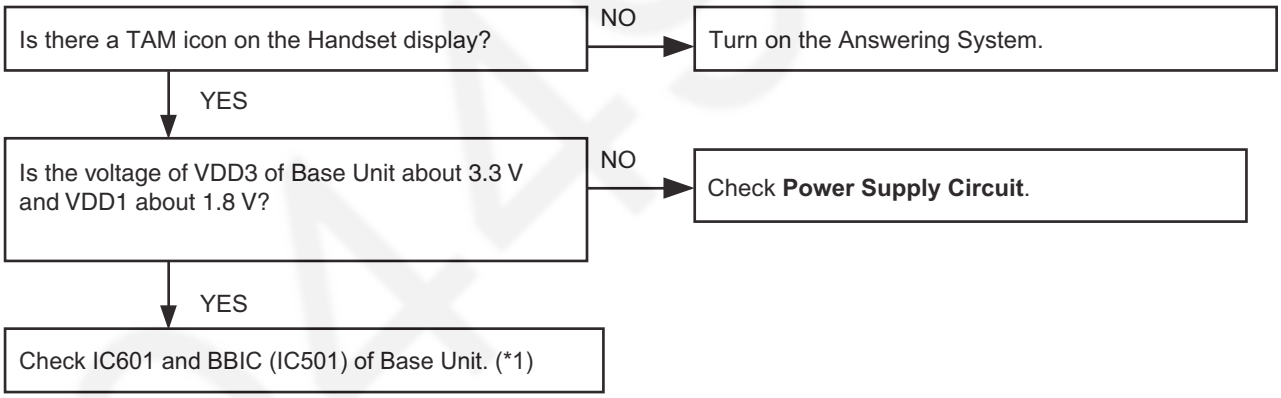
Cross Reference:

Telephone Line Interface (P.14)

Check Link (P.32)

How to Check the Handset Speaker or Receiver (P.61)

9.1.10. Check TAM Operation



Cross Reference:

Power Supply Circuit (P.13)

Note:

(*1) When replacing FLASH MEMORY (IC601), TAM data need to be written to it. Refer to **Base Unit** of **Things to Do after Replacing IC or X'tal** (P.58)

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

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

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

Note:

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

(*2) Refer to **Check Point (Base Unit)** (P.40)

9.2.1. Check Point (Base Unit)

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

Note:

After the measuring, suck up the solder of TP.

*: **The Setting Method of JIG (Base Unit)** (P.52) is required beforehand.

The connections of simulator equipment are as shown in **Adjustment Standard (Base Unit)** (P.54).

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)	3.3 V Supply Confirmation	VDD3	1. Confirm that the voltage between test point VDD3 and GND is 3.3 V ± 0.2 V.	IC302, R321, R322, C341, C342, C352, C343, C353
(**B**)	1.8 V Supply Confirmation	VDD1	1. Confirm that the voltage between test point VDD1 and GND is 1.8 V ± 0.02 V. 2. Execute the command "VDD", then check the current value. 3. Adjust the 1.8V voltage of VDD1 executing command "VDD XX"(XX is the value).	Q501, IC501, R506, C522, C519, C508, D501
(**C**)	1.5 V Supply Confirmation	1.5 V	1. Confirm that the voltage between test point 1.5 V and GND is 1.5 V ± 0.01 V.	IC800
(**E**)*	BBIC Confirmation	-	1. BBIC Confirmation (Execute the command "getchk"). 2. Confirm the returned checksum value. Connection of checksum value and program number is shown below. ex.) checksum value: C345 / program number: JHS1AA	IC501, X1
(**F**)*	EEPROM Confirmation	-	1. EEP-ROM Confirmation (Execute the command "sendchar EPV"). 2. Confirm the returned Value. (Value for reference is written at "EEPROM C/SUM" in Software_Version_Table.xls).	IC501, R516, IC502, C534
(**G**)*	BBIC Clock Adjustment	CKM	1. Confirm that the voltage between testpoint VDD4 and GND is less than 1.0 V. 2. Input Command " sendchar sfr", then you can confirm the current value. 3. Check X'tal Frequency. (10.368 MHz ± 100 Hz). 4. If the frequency is not 10.368 MHz ± 100 Hz, adjust the frequency of CKM executing the command "sendchar sfr xx xx (where xx is the value)" so that the reading of the frequency counter is 10.368000 MHz ± 5 Hz.	IC501, X1, C704
(**H**)*	Hookswitch Check with DC Characteristics	-	1. Connect Telephone Socket to Tel-simulator which is connected with 600 Ω. 2. Set line voltage to 48 V and line current to 40mA at off-hook condition of normal telephone. 3. Execute the command "hookoff" 4. Confirm that the line current is 40 mA ± 5 mA. 5. Execute the command "hookon". 6. Confirm that the line current is less than + 0.8 mA.	P101, Q141, R141, R142, Q142, R144, R145, D101, R161~R167, D141, Q161, R151, IC501
(**I**)	DTMF Generator Check	-	1. Connect Telephone Socket to DTMF tester. (Load=600 Ω) 2. Link Handset and push dial key. 3. Confirm DTMF character. 4. Confirm that the high Group is -6.5 ± 2 dBm. 5. Confirm that the low Group is -8.5 ± 2 dBm	IC501, C184, Q161, D141 , C187

	Items	Check Point	Procedure	Check or Replace Parts
(**J**)*	Transmitted Power Confirmation	- ANTI_TP	Remove the Antenna before starting step from 1 to 7. 1. Configure the DECT tester (CMD60) as follows; <Setting> • Test mode: FP • Traffic Carrier: 2 • Traffic Slot: 4 • Mode: Loopback • PMID: 00000 • RF LEVEL = -70 dBm. 2. Execute the command ”sendchar TST”. 3. Execute the command “sendchar dmv 2 2”. 4. Check that “Signalling Status” has been set to “Locked”, then press “ACCEPT RFPI”. 5. Initiate connection from Dect tester (“set up connect”) 6. Execute the command “ANT2”. 7. Confirm that the NTP value at ANT is 17.0 dBm ~ 20.0 dBm.	IC501, C891, C93, C894, DA802, Q502, C525, R507
(**L**)*	Frequency Offset Check	- ANTI_TP	Follow steps 1 to 6 of **(J)**. 7.Confirm that the frequency offset is < ± 20 kHz.	Refer to (J)
(**M**)*	Sensitivity Receiver Confirmation	- ANTI_TP	Follow steps 1 to 6 of **(J)**. 7.Set DECT tester power to -88 dBm. 8.Confirm that the BER is < 1000 ppm.	Refer to (J)
(**N**)*	Power RAMP Confirmation	-	Follow steps 1 to 6 of **(J)**. 7.Confirm that Power RAMP is matching.	Refer to (J)
(**O**)	Audio Check	-	1. Link with Handset which is connected to Line Simulator. 2. Set line voltage to 48 V and line current to 50 mA. 3. Input -45 dBm (600 Ω)/1 kHz to MIC of Handset. Measure the Level at Line I/F and distortion level. 4. Confirm that the level is -2 dBm and that the distortion level is <5% at TEL Line (600 Ω Load). 5. Input -20 dBm (600 Ω)/1kHz to Line I/F. Measure the Level at Receiver of Handset and distortion level (Receive volume set to second position from minimum). 6. Confirm that the level is -28.0 ± 4 dBm and that the distortion level is <5 % at Receiver (34 Ω Load).	IC501, SA101, P101, D101, Q141, Q142, R141, R142, R144, R145, D141, Q161, R163, R164, C171, C173, R178, C184, C187
(**P**)	Charging Check	-	1. Connect Charge Contact 12 Ω/2 W resistor between charge+ and charge-. 2. Measure and confirm voltage across the resistor is 3.9 V ± 0.4 V.	R371, R372, D362, C351
(**Q**)	TAM Operation Confirmation	-	1. TAM Confirmation (Execute the command "sendchar VPI"). 2. Confirm the returned Value (Value is "JGP7AA 01").	IC501, IC601, C60
(**R**)	2.4V Supply Confirmation VDD2	VDD2	1. Confirm that the voltage between test point VDD2 and GND is 2.5V ± 0.1V.	IC501, Q502, C525, R507

9.3. Troubleshooting by Symptom (Handset)

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

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

Note:

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

(*2) Refer to **Check Point (Handset)** (P.42)

9.3.1. Check Point (Handset)

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

Note:

After the measuring, suck up the solder of TP.

*: **The Setting Method of JIG (Handset)** (P.55) is required beforehand.

The connections of adjustment equipment are as shown in **Adjustment Standard (Handset)** (P.57).

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)*	1.8 V Supply Adjustment	1.8V	1. Confirm that the voltage between test point 1.8V and GND is 1.8 V ± 0.02 V. 2. Execute the command "VDD", then check the current value. 3. Adjust the 1.8V voltage of 1.8V executing command "VDD XX"(XX is the value).	IC1, Q6, C47, R1, P1
(**B**)*	BBIC Confirmation	-	1. BBIC Confirmation (Execute the command "getchk"). 2. Confirm the returned checksum value. Connection of checksum value and program number is shown below. ex.) checksum value: F633 / program number: JHS2AA	IC1, X1, R27
(**C**)*	EEP-ROM Confirmation	-	1. EEP-ROM Confirmation (Execute the command "sendchar EPV"). 2. Confirm the returned Value. (Value for reference is written at "EEPROM C/SUM" in Software_Version_Table.xls).	IC1, IC3, RA1, C8
(**D**)	Charge Control Check & Charge Current Monitor Check	-	1. Apply 5.0 V between CHG(+) and CHG(-) with DC power supply and set current limit to 150 mA. Confirm the indication of "charging" on LCD. 2. Confirm that the current limit LED of DC power supply is ON/OFF. Confirm it after waiting over 1 minute at least. (If charge control cannot be confirmed by this procedure, please use battery to handset power supply and try again.)	IC1, Q3, Q4, Q1, Q2, R6, R3, R4, R7, R5, C7, P1, R1
(**E**)*	Charge Detection (OFF) Check	-	1. Stop supplying 5.0 V to CHG (+) and CHG (-). 2. Confirm the indication of "charging" has been cleared.	IC1, Q3, Q4, Q1, Q2, R6, R3, R4, R7, R5, C7, P1, R1

	Items	Check Point	Procedure	Check or Replace Parts
(**F**)*	Battery Monitor Check	-	1. Apply 2.25 V between BATT+ and BATT-. 2. Execute the command sendchar PAD sendchar LED 0 sendchar CRX 0 1 sendchar AD1 It assumes that the return value is XX. a) XX: 70: No need to adjust b) XX: 66 ~ 6F: Need to adjust XX: 71 ~ 7A: Need to adjust Write AD value of 2.25 V to EEPROM. ex) read data: XX = 6A, write data: YY = 6A read data: XX = 73, write data: YY = 73 EEPROM = 0009(Low Voltage) write “YY” Execute the command “wreeprom 00 09 01 YY”. EEPROM = 000A(No Voltage) write “YY -C" Execute the command “wreeprom 00 0A 01 ZZ”. **Note:** ZZ = YY - C c) XX: 00 ~ 65: Reject XX: 7B ~ FF: Reject	IC1, P1, R1
(**G**)	Battery Low Confirmation	-	1. Apply 2.40 V between BATT+ and BATT-. 2. Confirm that there is no flashing of Battery Icon. 3. Apply 2.25 V ± 0.08 V between BATT+ and BATT-. 4. Confirm that there is flashing of Battery Icon.	IC1, P1, R1
(**H**)*	BBIC Clock Adjustment	CKM	1. Apply 2.6 V between BATT+ and BATT- with DC power. 2. Input Command “sendchar sfr”, then you can confirm the current value. 3. Check X’tal Frequency. (10.368 MHz ± 100 Hz). 4. If the frequency is not 10.368 MHz ± 100 Hz, adjust the frequency of CKM executing the command “sendchar sfr xx xx (where xx is the value)” so that the reading of the frequency counter is 10.368000 MHz ± 5 Hz. Note: Clear the registered information for Base Unit before measurement, because the Frequency will not possibly get stable due to the registered information. Pressing the button of "3" "5" "7" "#"clears the registration. Register to it on Base Unit after measurement.	IC1, X1, C40
(**I**)*	Transmitted Power Confirmation	-	Short Antenna pattern to GND. 1. Configure the DECT tester (CMD60) as follows; <Setting> • Test mode: PP • RFPI: 0102030405 • Traffic Carrier: 2 • Traffic Slot: 4 • Mode: Loopback • RF LEVEL = -70 dBm • PACKET: PP32Z 2. Execute the command “sendchar TST 01 02 03 04 05". 3. Initiate connection from DECT tester. 4. Confirm that the NTP value at ANT is 17 dBm ~ 20 dBm.	IC1, C50, C51, C53, C54,
(**K**)*	Frequency Offset Confirmation	-	Follow steps 1 to 3 of **(I)**. 4.Confirm that the frequency Offset is < ± 20 kHz.	Refer to (**I**)
(**L**)*	Sensitivity Receiver Confirmation	-	Follow steps 1 to 3 of **(I)**. 4.Set DECT tester power to -88 dBm. 5.Confirm that the BER is < 1000 ppm.	Refer to (**I**)
(**M**)*	Power RAMP Confirmation	-	Follow steps 1 to 3 of **(I)**. 4.Confirm that Power RAMP is matching.	Refer to (**I**)
(**N**)	Audio Check and Confirmation	-	1. Link to BASE which is connected to Line Simulator. 2. Set line voltage to 48 V and line current to 50 mA. 3. Input -45 dBm (600 Ω)/1 kHz to MIC of Handset. Measure the Level at Line I/F and distortion level. 4. Confirm that the level is -3 dBm ± 5 dB and that the distortion level is < 5 % at TEL Line (600 Ω Load). 5. Input -20 dBm (600 Ω)/1 kHz to Line I/F. Measure the Level at Receiver of Handset and distortion level (Receive volume set to second position from minimum). 6. Confirm that the level is -28.0 dBm ± 4 dB and that the distortion level is < 5 % at Receiver (34 Ω Load).	IC1, C11, R10, R11, R12, R13, MIC, C9, C10, C38, C39

	Items	Check Point	Procedure	Check or Replace Parts
(**O**)	SP phone Audio Check and Confirmation	-	1. Link to Base which is connected to Line Simulator. 2. Set line voltage to 48 V and line current to 50 mA. 3. Set the handset off-hook using SP-Phone key. 4. Input -30 dBm (600 Ω)/1 KHz to Line I/F and measure Receiving level at SP+ and SP-. 5. Confirm that the level is -7 dBm ± 3 dB and that the distortion level is < 5 %. (vol = Max at SP (8 Ω Load))	C1, C36, C37
(**P**)	DC/DC Converter 3.4V Supply	+3.4V	1. Confirm that the voltage between testpoint +3.4V and GND is 3.55V +/- 0.2V.	IC1, L3, Q8, R20, C21, R22, R21, C22
(**Q**)	Regulator 3.0 V Supply Confirmation	CP3V	1. Confirm that the voltage between testpoint +3.0V and GND is 3.0 V ± 0.2 V.	IC1, Q7, C42, C43, R30, R31, R32
(**R**)	DC/DC Converter LED+ Supply Confirmation	LED+	1. Confirm that the voltage between testpoint LED+ and GND is 9.0V ± 0.5 V. (Power is supplied when LED in on)	IC, L4, Q9, C18, C24, C25, R23, R24

9.3.2. Troubleshooting for Speakerphone

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

Conditions

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

Setting Method (*1)

Model	Content	Address	Default Data	New Data
PRWA13	TX 6dB Louder	02 E0	F5	8A
		02 E1	32	19
		02 DC	FC	FC
		02 DD	5F	5F
		02 DE	01	02
		02 DF	00	00
	TX 12dB Louder	02 E0	F5	CC
		02 E1	32	CC
		02 DC	FC	FC
		02 DD	5F	5F
		02 DE	01	03
		02 DF	00	00
	TX 6dB Lower	02 E0	F5	AC
		02 E1	32	65
		02 DC	FC	FC
		02 DD	5F	5F
		02 DE	01	00
		02 DF	00	00

* Do not enter New Data if the Default Data is different from the table above.

Note

(*1) Refer to **Handset** (**P.24**) of **Engineering Mode** to enter the Address or New Data.

10 Disassembly and Assembly Instructions

10.1. Disassembly Instructions

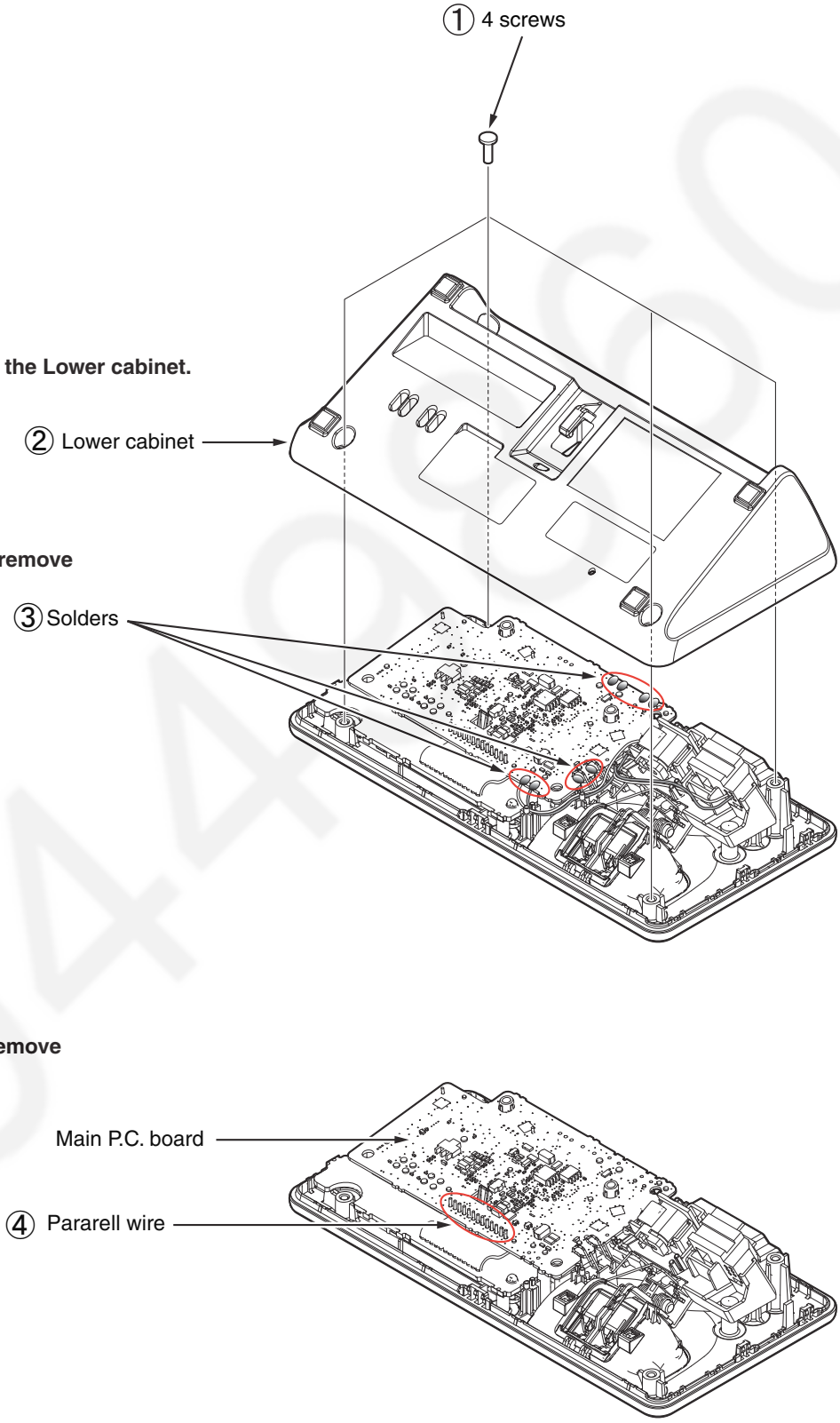
10.1.1. Base Unit

① **Remove the 4 screws.**

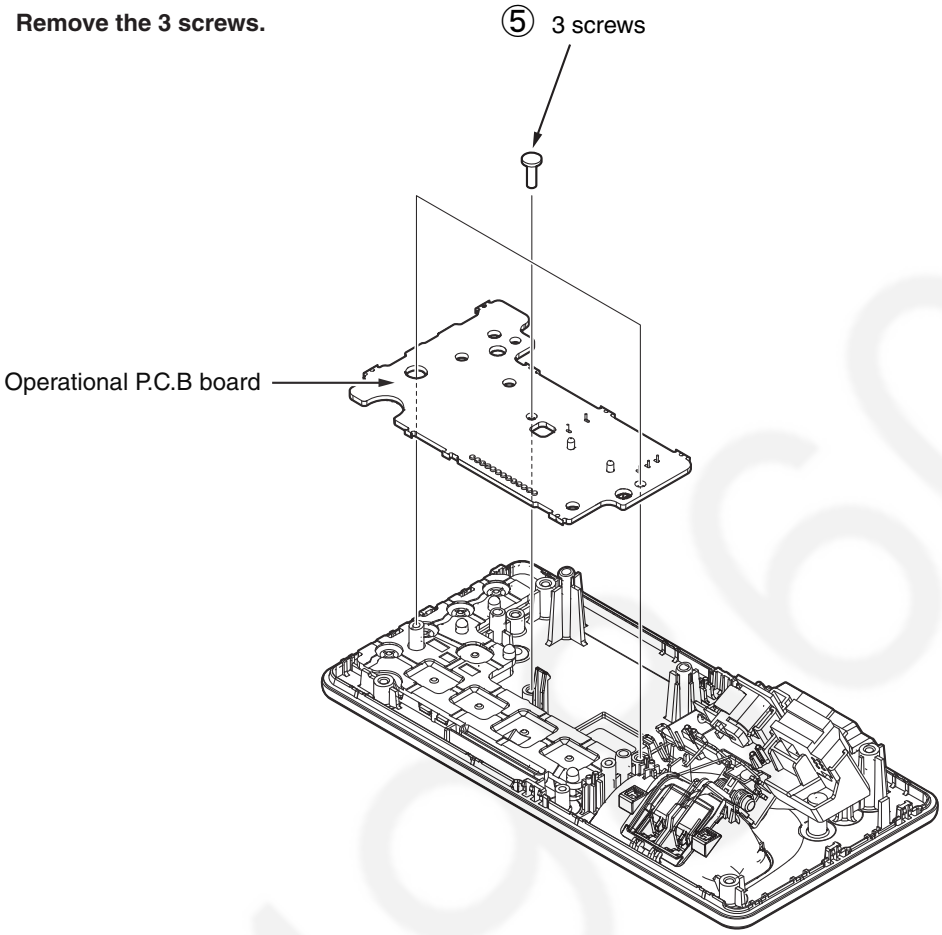
② **Then, pull up to remove the Lower cabinet.**

③ **Remove the solders to remove the main P.C.board.**

④ **Remove the solder to remove the main P.C.board.**

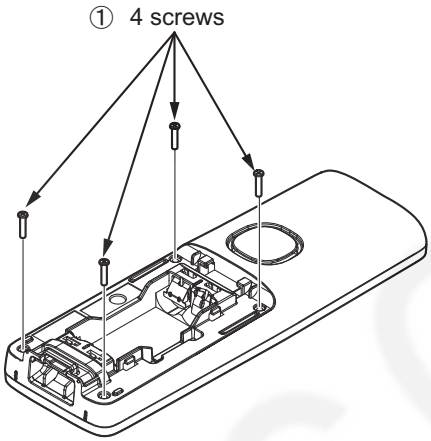


⑤ **Remove the 3 screws.**

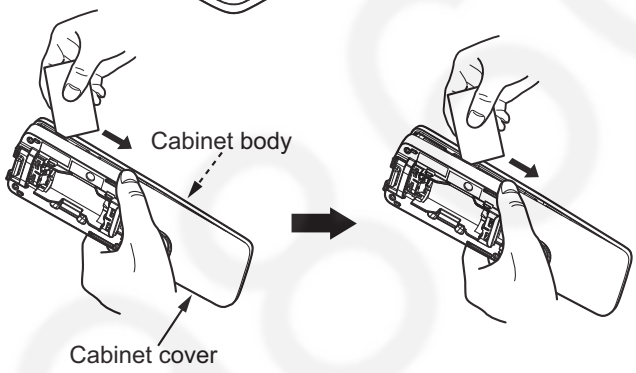


10.1.2. Handset

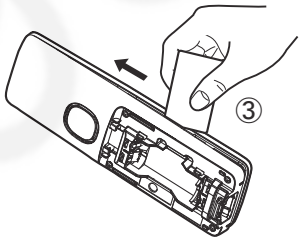
① **Remove the 4 screws.**



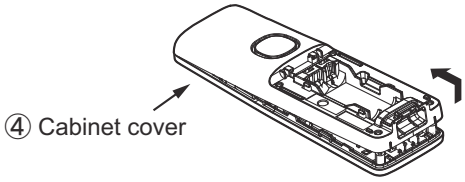
② **Insert a plastic card. (Ex.Used SIM card etc.) between the cabinet body and the cabinet cover, then pull it along the gap to open the cabinet.**



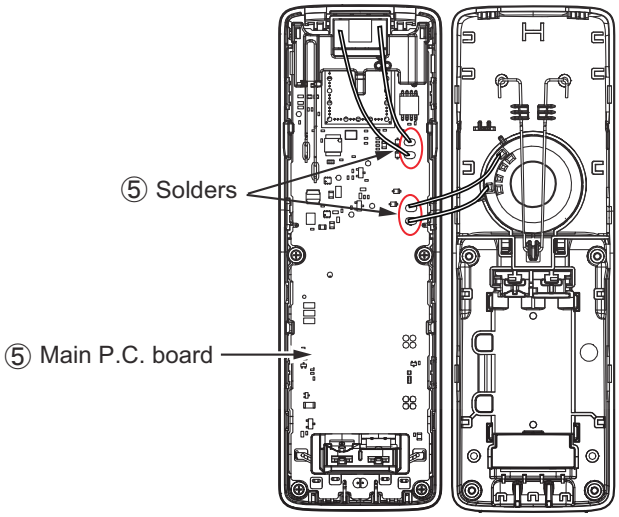
③ **Likewise, open the other side of the cabinet.**



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

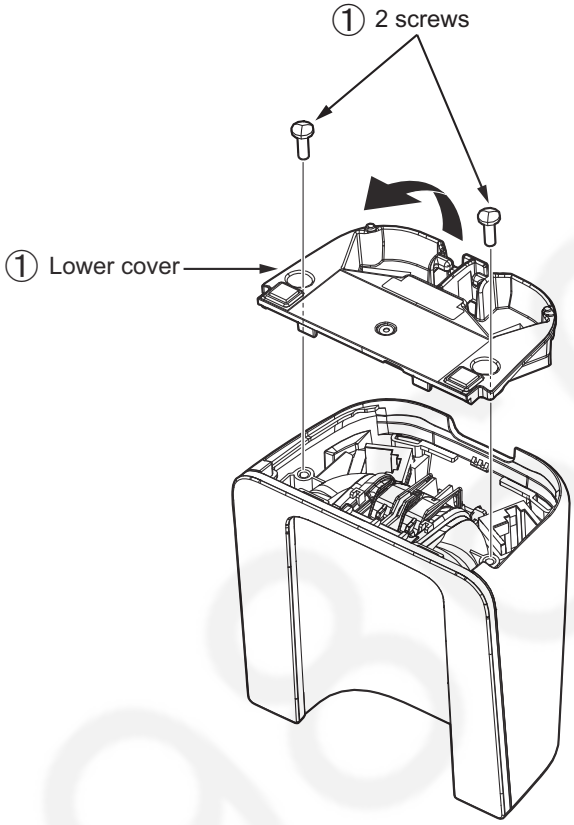


⑤ **Remove the solders to remove the main P.C.board.**

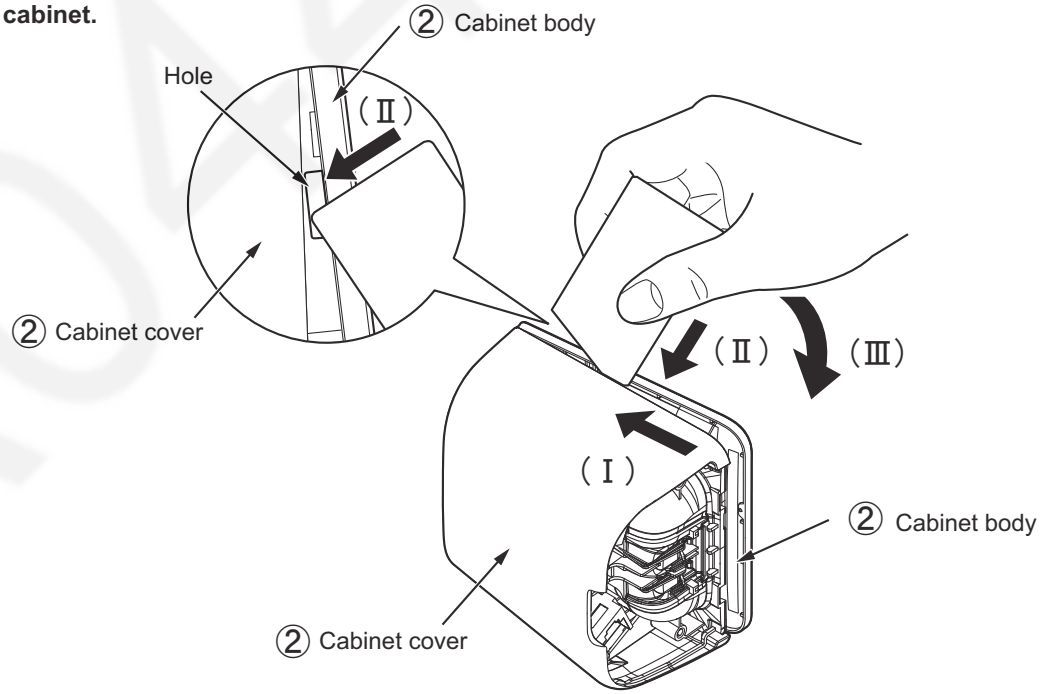


10.1.3. Charger Unit

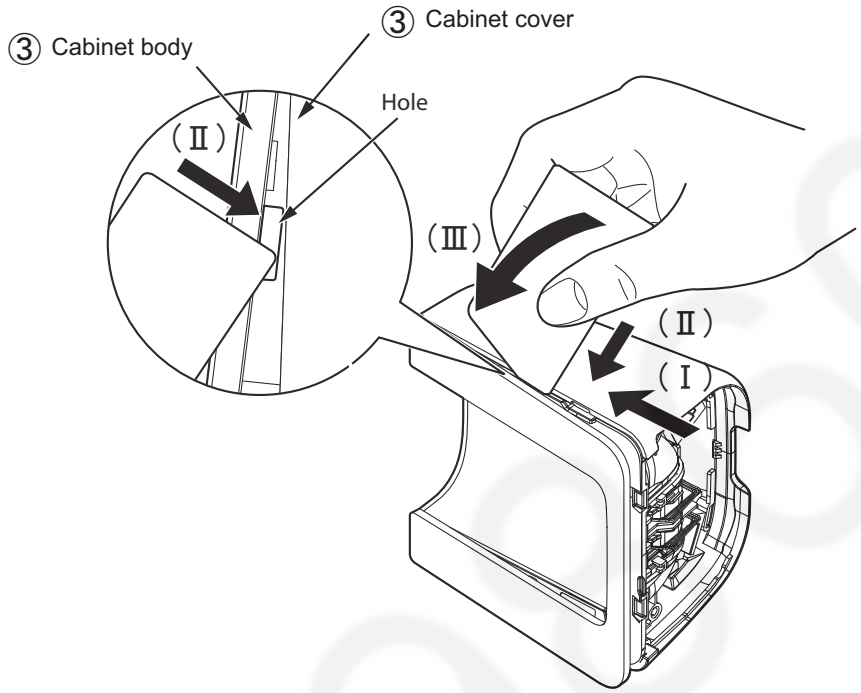
① **Remove 2 screws to remove the lower cover.**



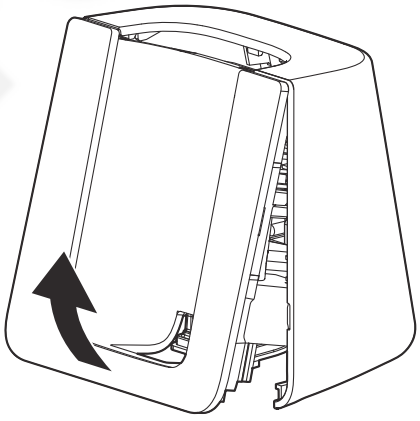
② **Push up the cabinet cover and insert a plastic card. (Ex.Used SIM card etc.) between the cabinet body and the cabinet cover, then pull it along the gap to open the cabinet.**



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



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

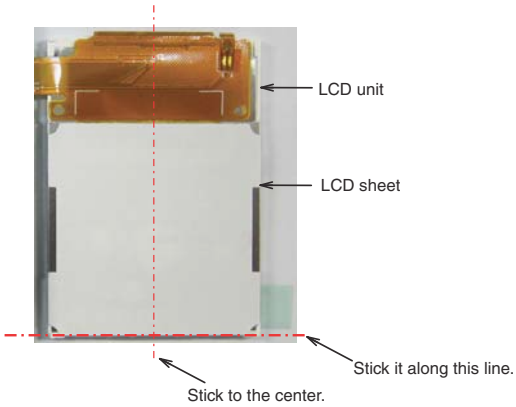


10.2. How to Replace the Handset LCD

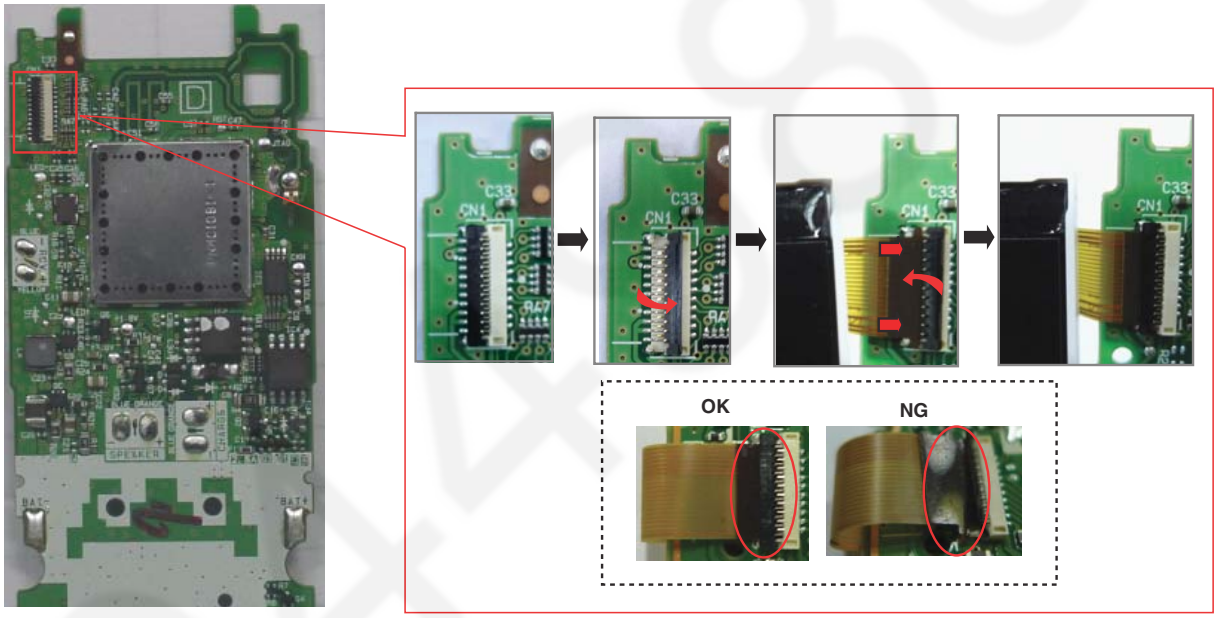
Note:

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

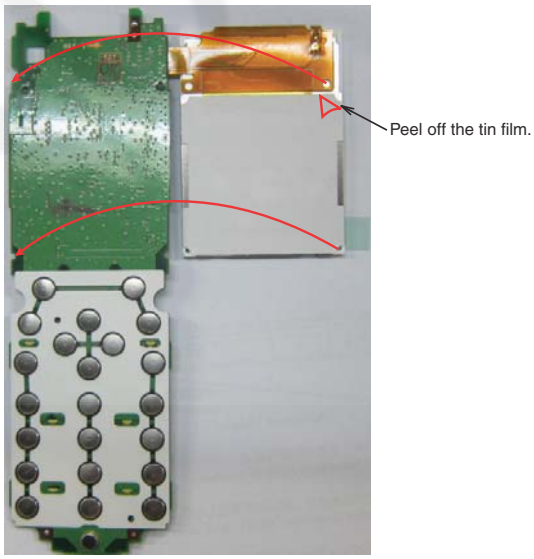
Stick the LCD Sheet on to the LCD Unit.

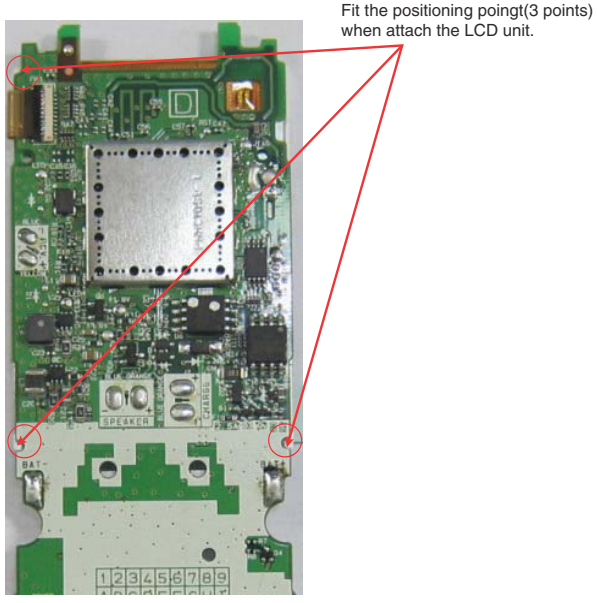


Insert the FPC to the Connector on the Main PCB.



3 Attach the LCD Unit on the PCB.





11 Measurements and Adjustments

This chapter explains the measuring equipment, the JIG connection, and the PC setting method necessary for the measurement in **Troubleshooting Guide** (P.28)

11.1. Equipment Required

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

  This equipment may be useful in order to precisely adjust like a mass production.

11.2. The Setting Method of JIG (Base Unit)

This section explains the PC setting to use command required in **Check Point (Base Unit)** (P.40).

<Preparation>

- Serial JIG cable: PQZZ1CD300E*
- PC which runs in DOS mode
- **Batch file CD-ROM** for settingPNZZPRW130

Note:

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

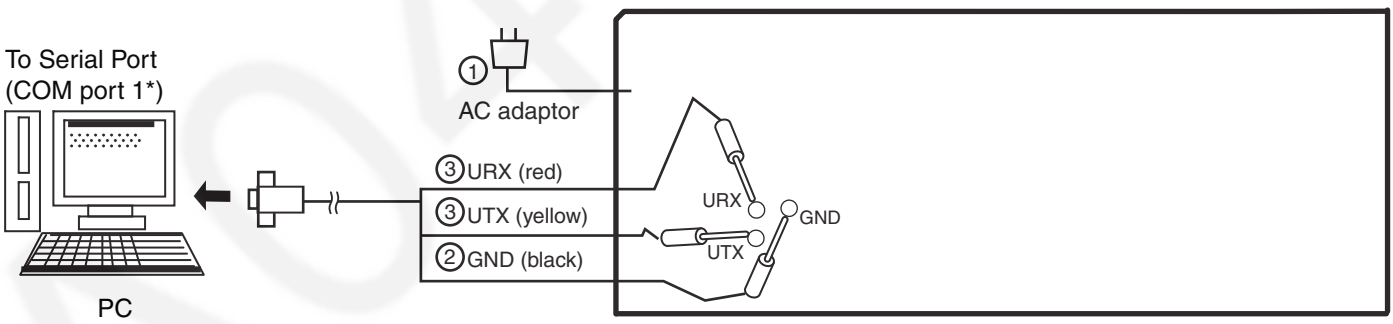
Resistor	Old value (kΩ)	New value (kΩ)
R2	22	3.3
R3	22	3.3
R4	22	4.7
R7	4.7	10

11.2.1. Connections

① Connect the AC adaptor to DC-JACK (base unit).

② Connect the JIG Cable GND (black) to GND.

③ Connect the JIG Cable RX (red) to URX and TX (yellow) to UTX.



Note:

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

11.2.2. How to install Batch file into P.C.

1. Insert the Batch file CD-ROM into CD-ROM drive and copy PNZZTG**** folder to your PC (example: D drive).

2. Open an MS-DOS mode window.

<Example for Windows>

On your computer, click **[Start]**, select **Programs** (**All Programs** for Windows XP/Windows Server 2003), then click
MS-DOS Prompt. (for Windows 95/Windows 98)
Or
Accessories-MS-DOS Prompt. (for Windows Me)
Or
Command Prompt. (for Windows NT 4.0)
Or
Accessories-Command Prompt.
(for Windows 2000/Windows XP/Windows Server 2003)

3. At the DOS prompt, type "**D:**" (for example) to select the drive, then press the **Enter** key.

4. Type "**CD ¥PNZZTG****"**, then press the **Enter** key.

5. Type "**SET_COM=X**", then press the **Enter** key
(**X**: COM port number used for the serial connection on your PC).

6. Type "**READID**", then press the **Enter** key.
- If any error messages appear, change the port number or check the cable connection.
- If any value appear, go to next step.

7. Type "**DOSKEY**", then press the **Enter** key.

<Example>

```
C: ¥Documents and Settings>D:
D: ¥>CD ¥PNZZTG****
D: ¥PNZZTG**** >SET_COM=X
D: ¥PNZZTG****>READID
00 52 4F A8 A8
D: ¥PNZZTG****>DOSKEY
D: ¥PNZZTG****>_
```

<Example: error happens>

```
C: ¥Documents and Settings>D:
D: ¥>CD ¥PNZZTG****
D: ¥PNZZTG**** >SET_COM=X
D: ¥PNZZTG****>READID
  CreateFile error
ERROR 10: Can't open serial port
D: ¥PNZZTG ****>_
```

Note:
- "*****" varies depending on the country or models.

11.2.3. Commands

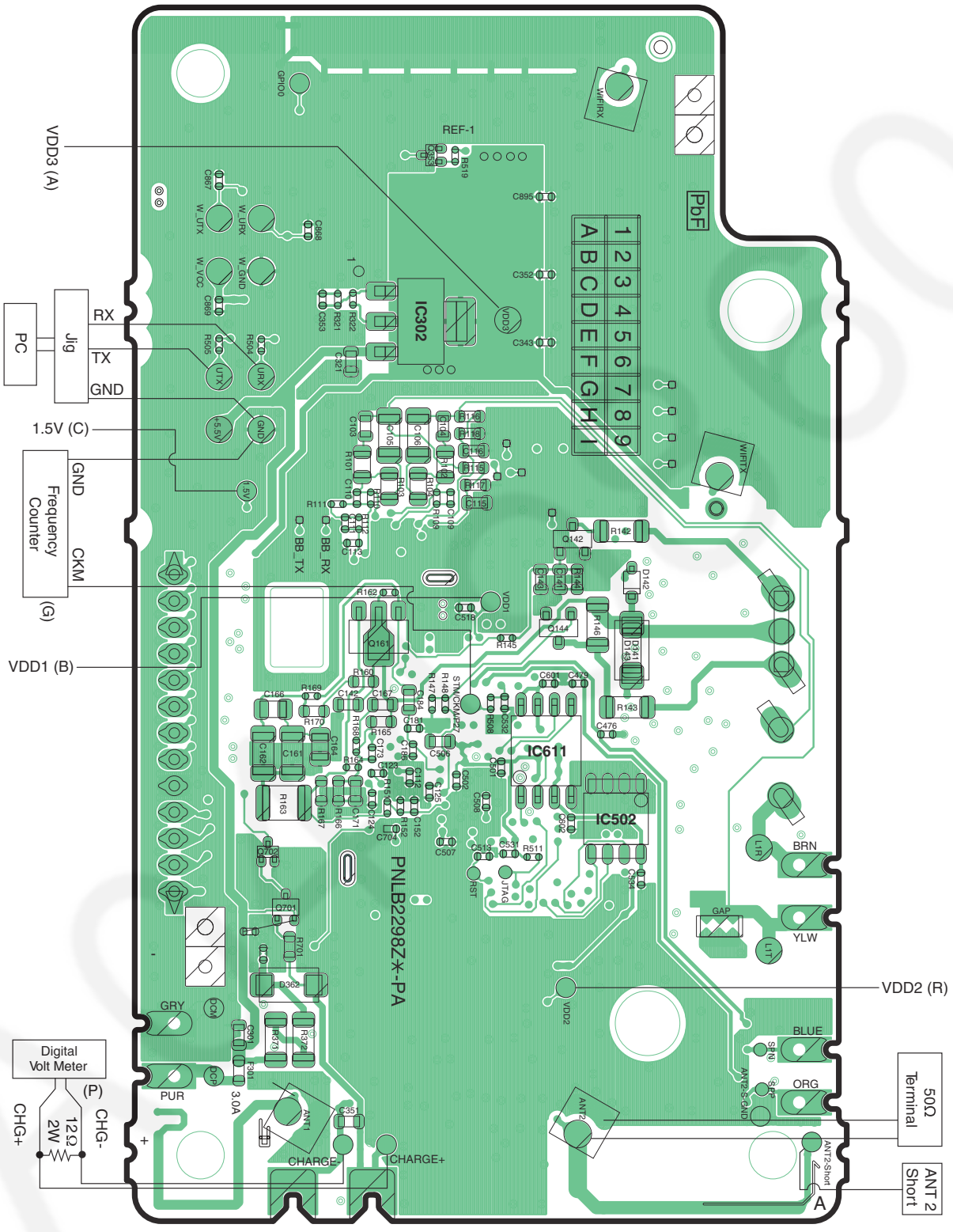
See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of EEPROM	Type "rdeeprom 00 00 FF", and the data from address "00 00" to "FF" is read out.
readid	Read ID (RFPI)	Type "readid", and the registered ID is read out.
writeid	Write ID (RFPI)	Type "writeid 00 18 E0 0E 98", and the ID "0018 E0 0E 98" is written.
hookoff	Off-hook mode on Base	Type "hookoff".
hookon	On-hook mode on Base	Type "hookon".
getchk	Read checksum	Type "getchk".
wreeprom	Write the data of EEPROM	Type "wreeprom 01 23 45". "01 23" is address and "45" is data to be written.

11.3. Adjustment Standard (Base Unit)

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

11.3.1. Bottom View



KX-PRW130 CIRCUIT BOARD (Main (Bottom View))

Note:

(**A**) - (**Q**) is referred to **Check Point (Base Unit)** (P.40)

11.4. The Setting Method of JIG (Handset)

This section explains the PC setting to use command required in **Check Point (Handset)(**P.42).

<Preparation>

- Serial JIG cable: PQZZ1CD300E*
- PC which runs in DOS mode
- **Batch file CD-ROM** for setting: PNZZPRW130

Note:

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

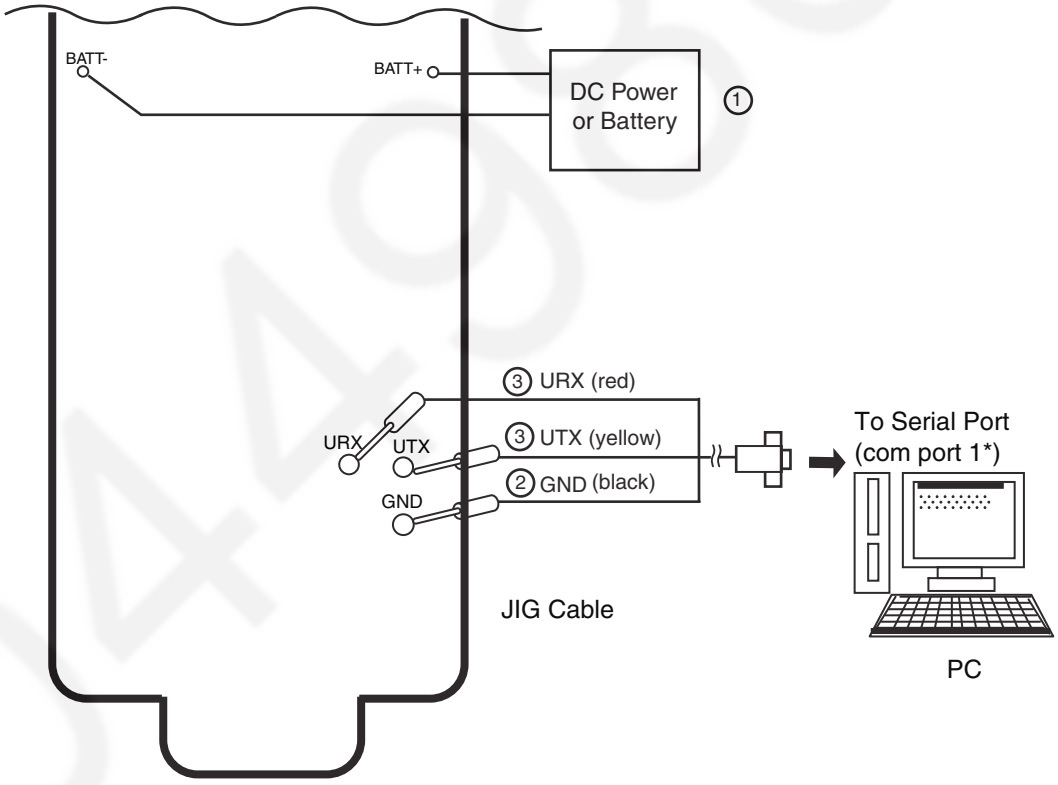
Resistor	Old value (kΩ)	New value (kΩ)
R2	22	3.3
R3	22	3.3
R4	22	4.7
R7	4.7	10

11.4.1. Connections

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

② Connect the JIG cable GND (black) to GND.

③ Connect the JIG cable UTX (yellow) to UTX and URX (red) to URX.



Note:

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

11.4.2. How to install Batch file into P.C.

1. Insert the Batch file CD-ROM into CD-ROM drive and copy PNZZTG***** folder to your PC (example: D drive).

2. Open an MS-DOS mode window.

<Example for Windows>

On your computer, click **[Start]**, select **Programs** (**All Programs** for Windows XP/Windows Server 2003), then click
MS-DOS Prompt. (for Windows 95/Windows 98)
Or
Accessories-MS-DOS Prompt. (for Windows Me)
Or
Command Prompt. (for Windows NT 4.0)
Or
Accessories-Command Prompt.
(for Windows 2000/Windows XP/Windows Server 2003)

3. At the DOS prompt, type "**D:**" (for example) to select the drive, then press the **Enter** key.

4. Type "**CD ¥PNZZTG*****"**, then press the **Enter** key.

5. Type "**SET RTX_COM=X**", then press the **Enter** key
(**X**: COM port number used for the serial connection on your PC).

6. Type "**READID**", then press the **Enter** key.
- If any error messages appear, change the port number or check the cable connection.
- If any value appear, go to next step.

7. Type "**DOSKEY**", then press the **Enter** key.

<Example>

```
C: ¥Documents and Settings>D:
D: ¥>CD ¥PNZZTG*****
D: ¥PNZZTG***** >SET RTX_COM=X
D: ¥PNZZTG*****>READID
00 52 4F A8 A8
D: ¥PNZZTG*****>DOSKEY
D: ¥PNZZTG*****>
```

<Example: Error happens>

```
C: ¥Documents and Settings>D:
D: ¥>CD ¥PNZZTG*****
D: ¥PNZZTG***** >SET RTX_COM=X
D: ¥PNZZTG*****>READID
  CreateFile error
ERROR 10: Can't open serial port
D: ¥PNZZTG*****>
```

Note:
- "*****" varies depending on the country or models.

11.4.3. Commands

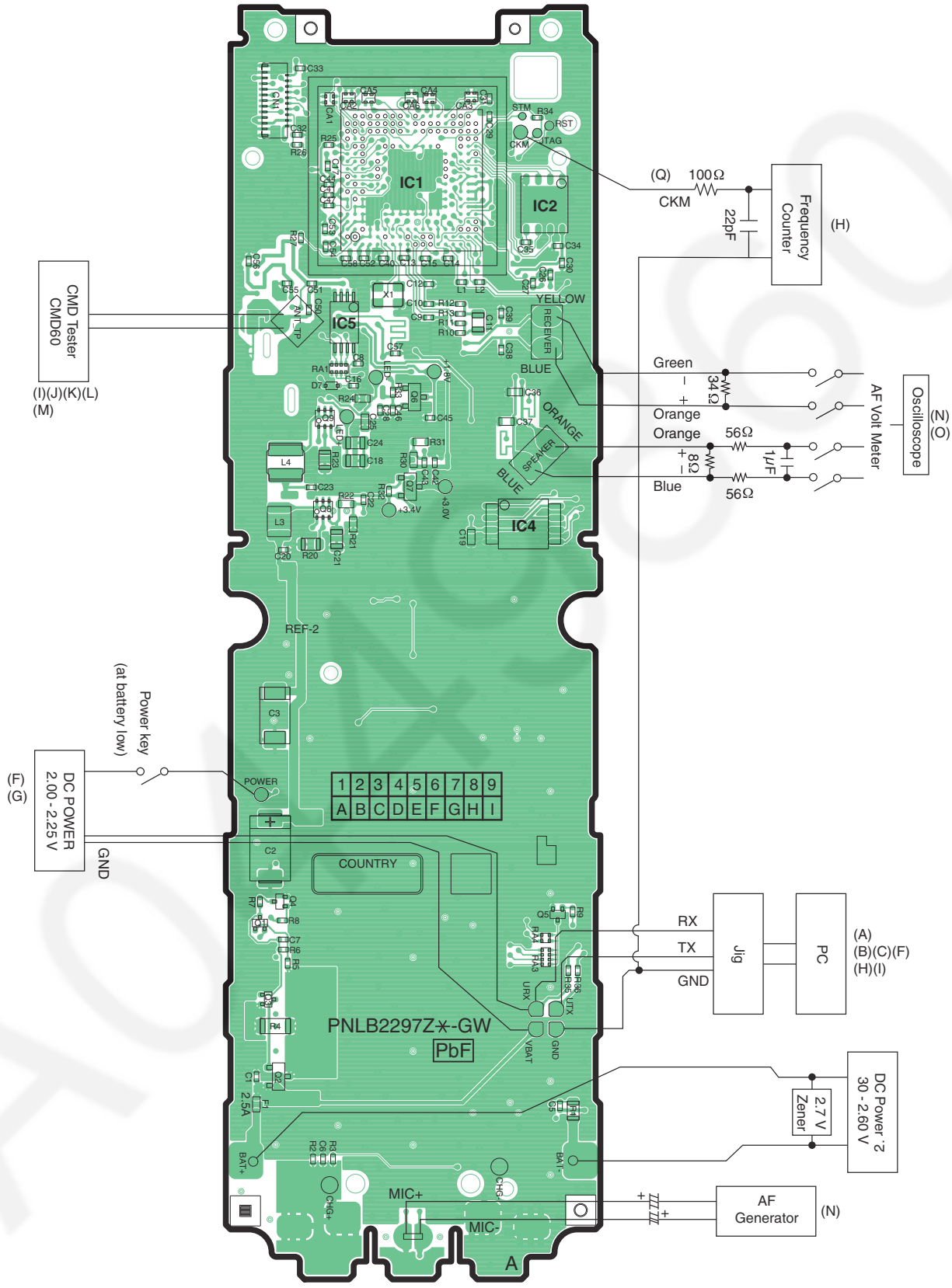
See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of EEPROM	Type "rdeeprom 00 00 FF", and the data from address "00 00" to "FF" is read out.
readid	Read ID (RFPI)	Type "readid", and the registered ID is read out.
writeid	Write ID (RFPI)	Type "writeid 00 18 E0 0E 98", and the ID "0018 E0 0E 98" is written.
getchk	Read checksum	Type "getchk".
wreeprom	Write the data of EEPROM	Type "wreeprom 01 23 45". "01 23" is address and "45" is data to be written.

11.5. Adjustment Standard (Handset)

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

11.5.1. Component View



KX-PRWA13 CIRCUIT BOARD (Main (Bottom View))

Note:

(**A**) - (**R**) is referred to **Check Point (Handset)** (P.42)

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

If repairing or replacing BBIC (FLASH type), EEPROM and X'tal, it is necessary to download the required data such as Programming data or adjustment data, etc in memory.
The set doesn't operate if it is not executed.

11.6.1. How to download the data

11.6.1.1. Base Unit

First, operate the PC setting according to **The Setting Method of JIG (Base Unit)(**P.52).
Then download the appropriate data according to the following procedures.

Items		How to download/Required adjustment
BBIC (IC501)	Programming data is stored in memory.	1) System Clock adjustment.
X'tal (X501)	System clock	Clock adjustment data is in EEPROM, adjust the data again after replacing it. 1) Apply 5.5V between DCP ad DCM with DC power. 2) Input Command "sendchar sfr", then you can confirm the current value. 3) Check X'tal Frequency.(10.368 MHz ± 100 Hz). 4) If the frequency is not 10.368 MHz ± 100 Hz, adjust the frequency of CKM executing the command "sendchar sfr xx xx (where xx is the value)" so that the reding of the frequency counter is 10.368 MHz ± 5 Hz.

Note:

(*1) W: country code, XXX_YYY: revision number
“XXX_YYY” vary depending on the country version. You can find them in the batch file, PNZZ- mentioned in **The Setting Method of JIG (Base Unit)** (P.52).

(*2) Refer to **Check Point (Base Unit)** (P.40)

11.6.1.2. Handset

First, operate the PC setting according to **The Setting Method of JIG (Handset)(**P.55).
Then download the appropriate data according to the following procedures.

Items		How to download/Required adjustment
BBIC (IC1)	Programming data is stored in memory.	1) System Clock adjustment.
EEPROM (IC5)	Adjusted parameter data is stored in memory. (country version batch file, default batch file, etc.)	1) Change the address “0001” of EEPROM to “55” to download the data. 2) Default batch file: Execute the command “default.bat”. 3) Default batch file (remaining): Execute the command “PRWA13US_DEF_RevXXX_YYY.bat”. (*3) 4) Country version batch file: Execute the command “PRWA13US_W_RevXXX_YYY.bat”. (*3) 5) Clock adjustment: Refer to Check Point (H). (*4) 6) 1.8 V setting and battery low detection: Refer to Check Point (A), (F) and (G). (*4)
X'tal (X1)	System clock	Clock adjustment data is in EEPROM, adjust the data again after replacing it. 1) Refer to Check Point (C). (*4)

Note:

(*3) W: country code, XXX_YYY: revision number
“XXX_YYY” vary depending on the country version. You can find them in the batch file, PNZZ- mentioned in **The Setting Method of JIG (Handset)** (P.55).

(*4) Refer to **Check Point (Handset)** (P.42)

11.7. RF Specification

11.7.1. Base Unit

Item	Value	Refer to -. *
TX Power	17 dBm ~ 20 dBm	**Check Point (Base Unit) (J)**
Frequency Offset	±20 kHz	**Check Point (Base Unit) (L)**
RX Sensitivity	< 1000 ppm	**Check Point (Base Unit) (M)**
Power RAMP	Power RAMP is matching	**Check Point (Base Unit) (N)**

*: Refer to **Check Point (Base Unit)** (P.40)

11.7.2. Handset

Item	Value	Refer to -. **
TX Power	17 dBm ~ 20 dBm	**Check Point (Handset) (I)**
Frequency Offset	±20 kHz	**Check Point (Handset) (K)**
RX Sensitivity	< 1000 ppm	**Check Point (Handset) (L)**
Power RAMP	Power RAMP is matching	**Check Point (Handset) (M)**

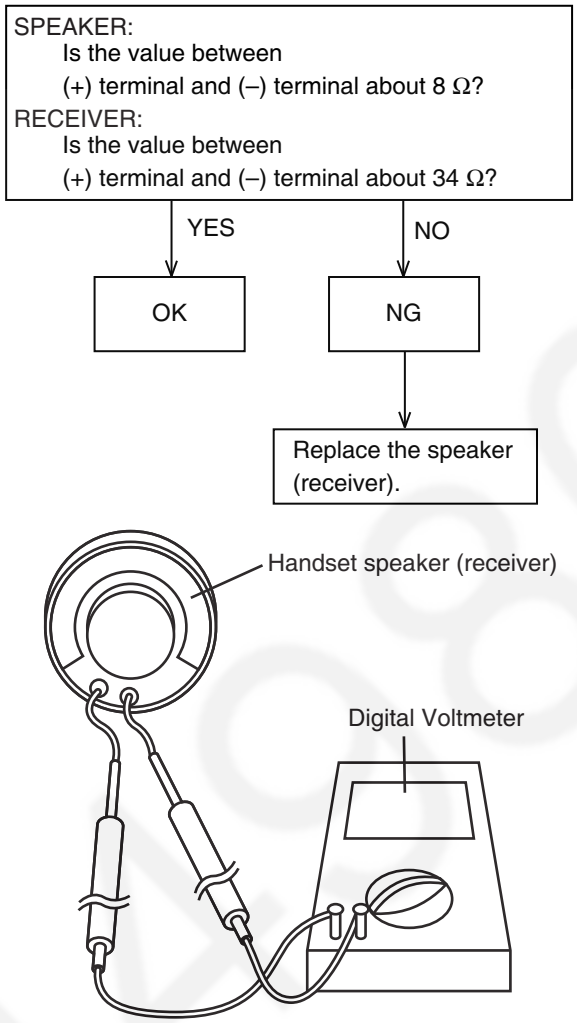
: Refer to **Check Point (Handset) (P.42)

11.8. Frequency Table

	Ch. (hex)	TX/RX Frequency (MHz)
Channel 0	00	1928.448
Channel 1	01	1926.720
Channel 2	02	1924.992
Channel 3	03	1923.264
Channel 4	04	1921.536

11.9. How to Check the Handset Speaker or Receiver

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



11.10. Frequency Table (MHz)

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

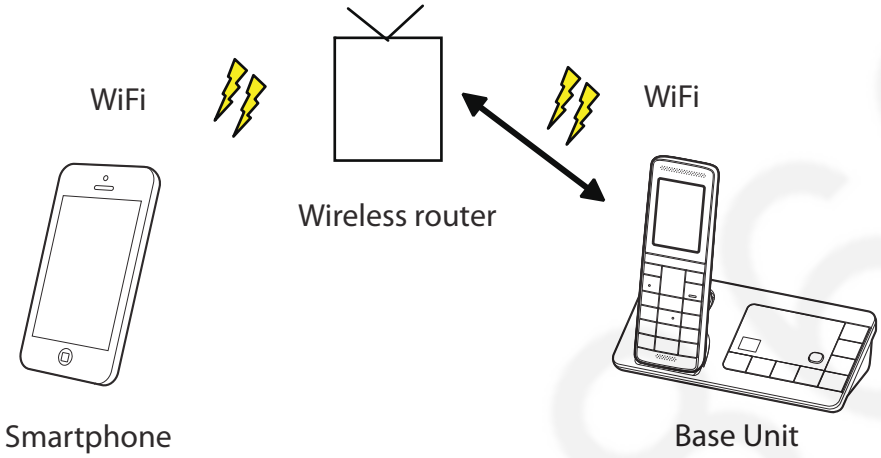
Note:

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

11.11. Confirm WiFi connection after replacing IC800

After replacing IC800, please check the below steps for confirming the Fix.

1) Confirm MAC address by OI (Operation Instruction manual) in order to check control signals between BBIC and WiFi module.
2) If cannot display MAC address or cannot go into "Network setup", please reconfirm soldering IC800.
3) Follow 11.10.1 to set Frequency and Power level of WiFi module.
4) Next please try to talk with WiFi Smartphone via Wireless router in order to check audio signals between BBIC and WiFi module.



Note:

For setting on Wireless router and Smartphone, please refer to OI of those.

11.11.1. Frequency and Power Level of WiFi Module

<Preparation>

- •Serial JIG cable: PQZZ1CD300E*
- •PC
- •**Batch file CD-ROM** for setting: PNZZPRW130

• Connect PC and base unit at JIG

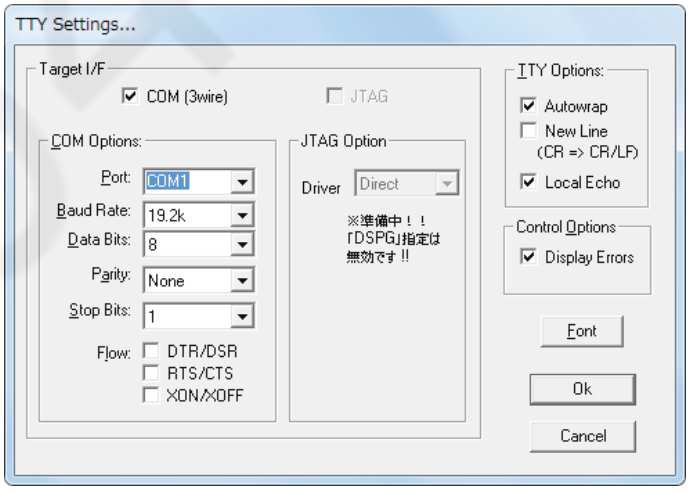
Cross Reference:

Connections (**P.52**)

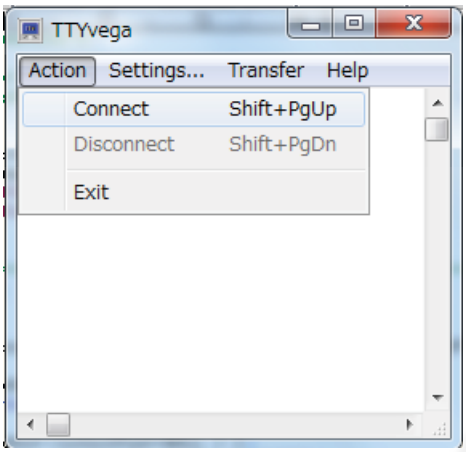
• Setup serial communication tool.

① Execute TTY2.exe (which is include CD-ROM as above).

② Click “Setting” and set parameters as below



③ Click “Action” and “Connect”.



<Set Frenquency and Power level>

[1] Confirm "Boot mode" for servicing.

• Type「&X 0echo "`bootmode br`"」and then press return key.

PC Display

```
＞&X 0echo "`bootmode br`"
      ⋮
＞BootMode：11
```

• When returning「BootMode:11」, goes to Step [2].
• When returned "WNG", please wait until WiFi module is ready(about 30sec) and then try to do step[1] again.
• When returned except "Bootmode:11", please try to do step[1] again.

[2] Enter ”Test mode”.

• Type「&X 1wifi_init.sh sta」and then press return key.

PC Display

```
＞&X1Wifi_init.sh sta
      ⋮
＞OK
```

• Type「&X 1wifi_set_wlan_param.sh ATE=ATESTART」and then press return key.

PC Display

```
＞&X 1wifi_set_wlan_param.sh ATE=ATESTART
      ⋮
＞OK
```

[3] Write ”Frequency”.

• Type「&X 1wifi_e2p_low8_acs.sh 3a=18」and then press return key.

PC Display

```
＞&X 1wifi_e2p_low8_acs.sh 3a=18
      ⋮
＞OK
```

[4] Write ”TX power”.

- Type「&X 1wifi_set_all_txpower.sh 13」and then press return key.
- Approx 10sec may be taken sometime to OK.

PC Display

```
>&X 1wifi_set_all_txpower.sh 13
      ⋮
>OK
```

[5] Write BootMode for usually using.

- Type「&X 1bootmode bw 10」and then press return key.

PC Display

```
>&X 1bootmode bw 10
      ⋮
>OK
```

- Type「&X 0echo "`bootmode br`"」and then press return key.

PC Display

```
>&X 0echo "`bootmode br`"
      ⋮
>BootMode：10
```

[6] Return to the stand-by mode.

- Remove Jig and turn off the unit.

12 Miscellaneous

12.1. How to Replace the Flat Package IC

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

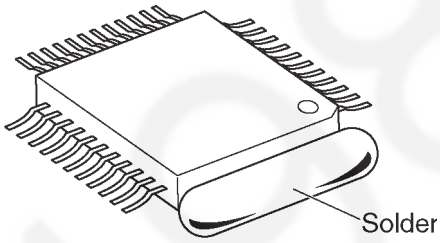
12.1.1. Preparation

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

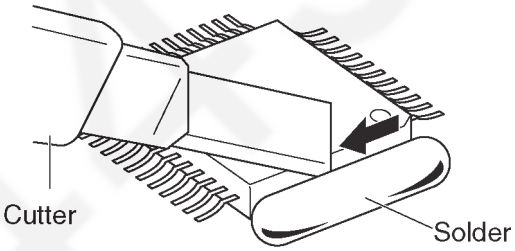
Note: See **About Lead Free Solder (Pbf: Pb free)** (P.5)

12.1.2. How to Remove the IC

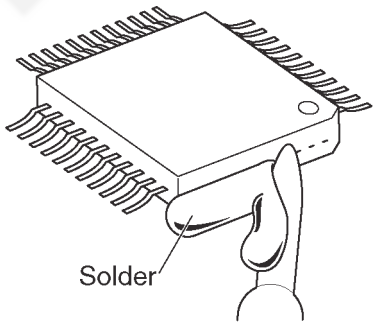
1. Put plenty of solder on the IC pins so that the pins can be completely covered.
   Note:
   If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



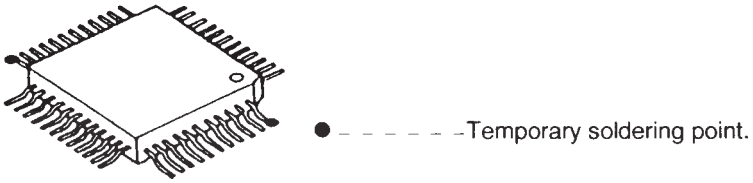
3. While the solder melts, remove it together with the IC pins.



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

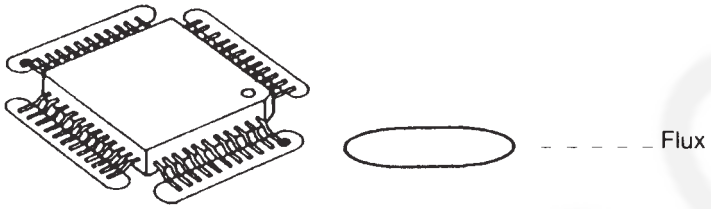
12.1.3. How to Install the IC

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

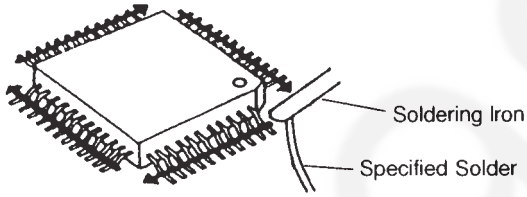


*Check the accuracy of the IC setting with the corresponding soldering foil.

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

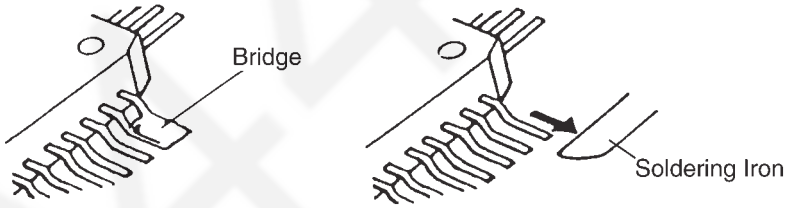


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



12.1.4. How to Remove a Solder Bridge

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



12.2. How to Replace the Shield Case

12.2.1. Preparation

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

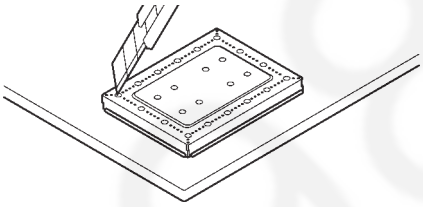
12.2.2. Caution

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

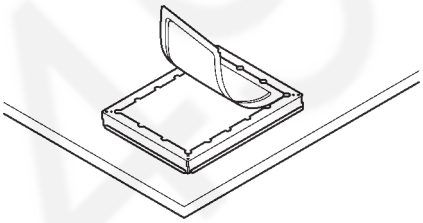
12.2.3. How to Remove the Shield Case

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

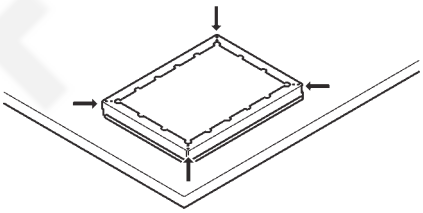
1. Cut the case along perforation.



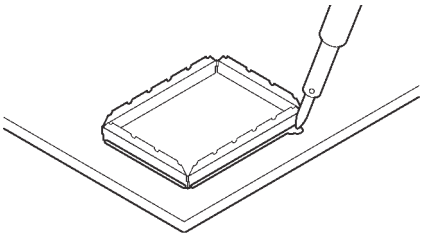
2. Remove the cut part.



3. Cut the four corners along perforation.



4. Remove the reminds by melting solder.

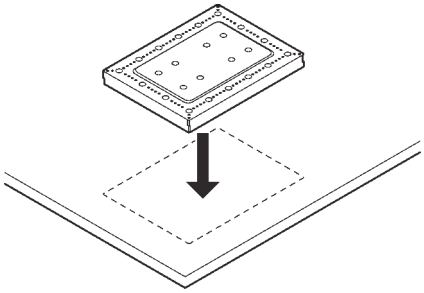


12.2.4. How to Install the Shield Case

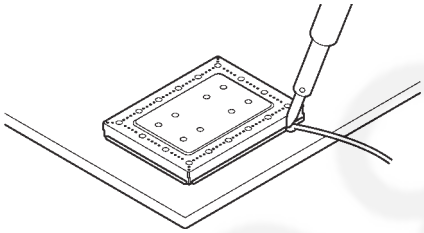
Note:

- If you don't have special tools (ex. Hot air disordering tool), conduct the following operations.
- Shield case's No. : PNMC1091Z, PNMC1033Z

1. Put the shield case.

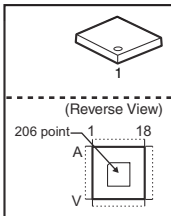
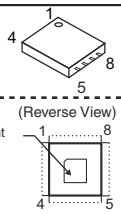
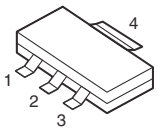
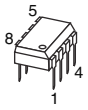
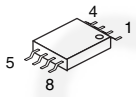
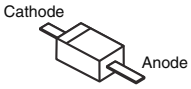
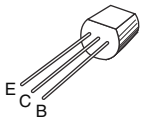
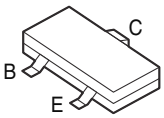
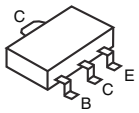
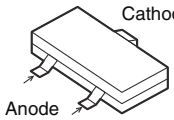
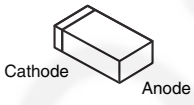


2. Solder the surroundings.

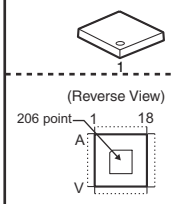
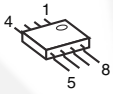
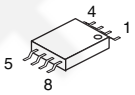
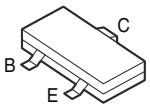
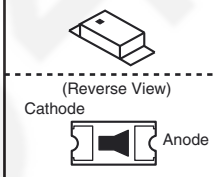
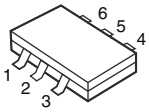


12.3. Terminal Guide of the ICs, Transistors, Diodes and Electrolytic Capacitors

12.3.1. Base Unit

 C1CB00003611	 PNWI2PRW130H	 C0CBAYG00016	 PNWI1RW130H	 PNWI3PRW130H
 1SS355	 B1ACGP000008	 2SC6054JSL, B1ABDM000001 B1ADGE000012, 2SA1576S B1GBCFYY0020		 B0EDER000009
 DSC7003S0L	 B0DDCD000001	 B0ECKM000008		

12.3.2. Handset

 C1CB00003611	 PNWI2PRWA13R	 PNWI1PRWA13R ,C3FBQY000103	 B1ADGE000012, B1ADCF000040 B1ABGE000011, 2SC6054JSL
 B0JCDD000001	 B3AFB0000570	 FM6K62010L	

13 Schematic Diagram

13.1. For Schematic Diagram

13.1.1. Base Unit (Base Unit (Main))

Notes:

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

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

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

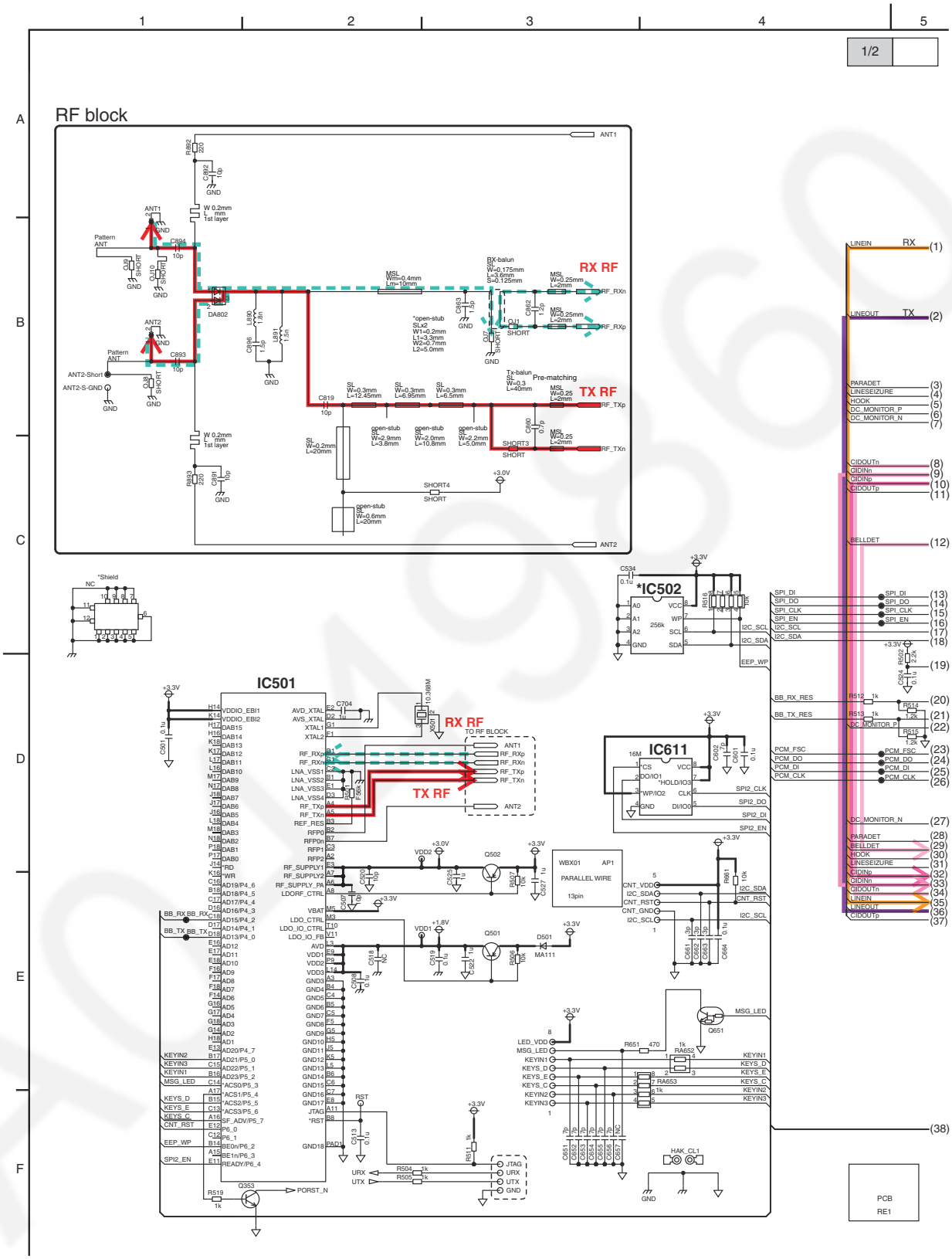
13.1.2. Handset (Handset)

Notes:

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

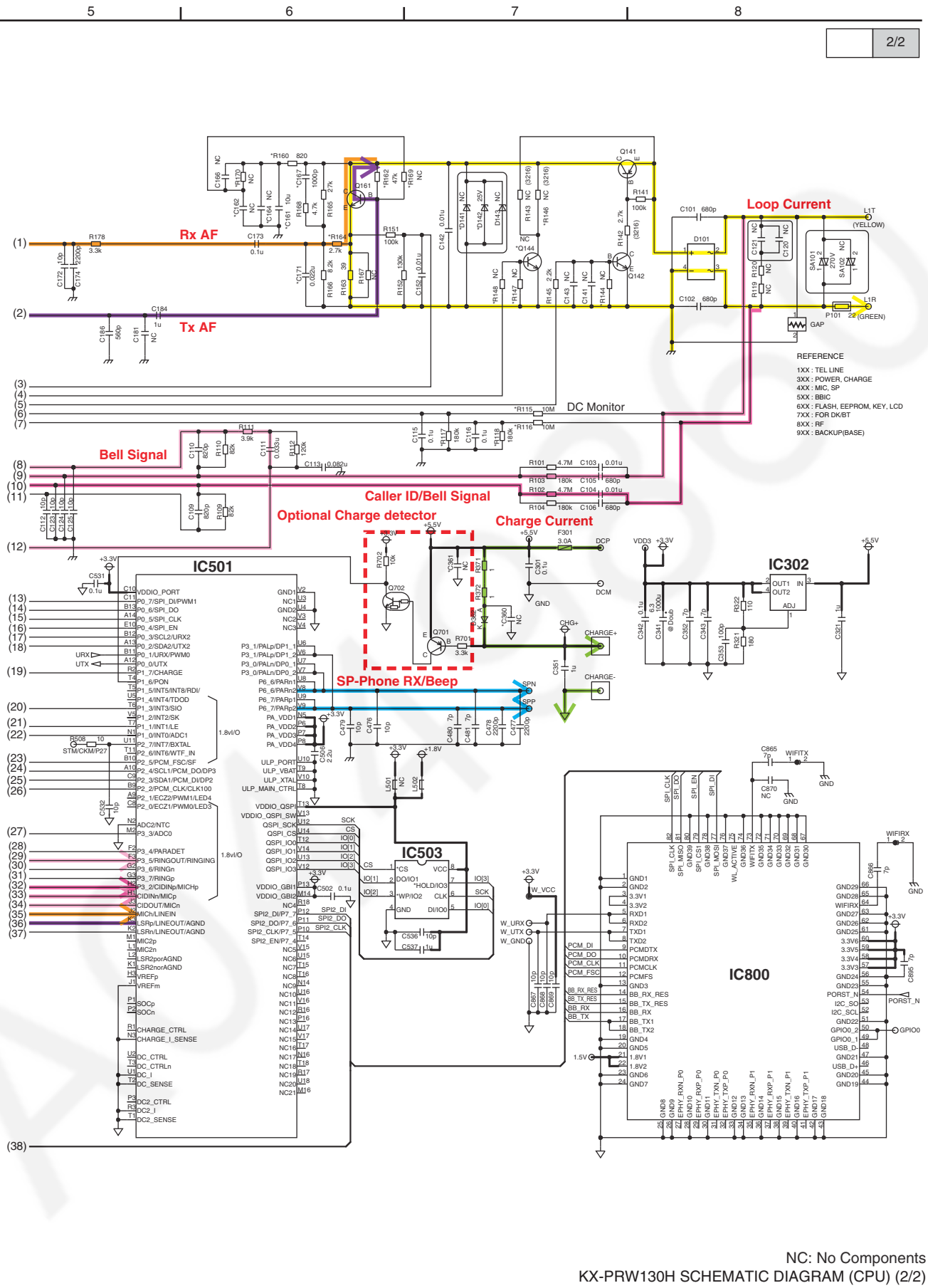
13.2. Base Unit (Main)

13.3. KX-PRW130



NC: No Components

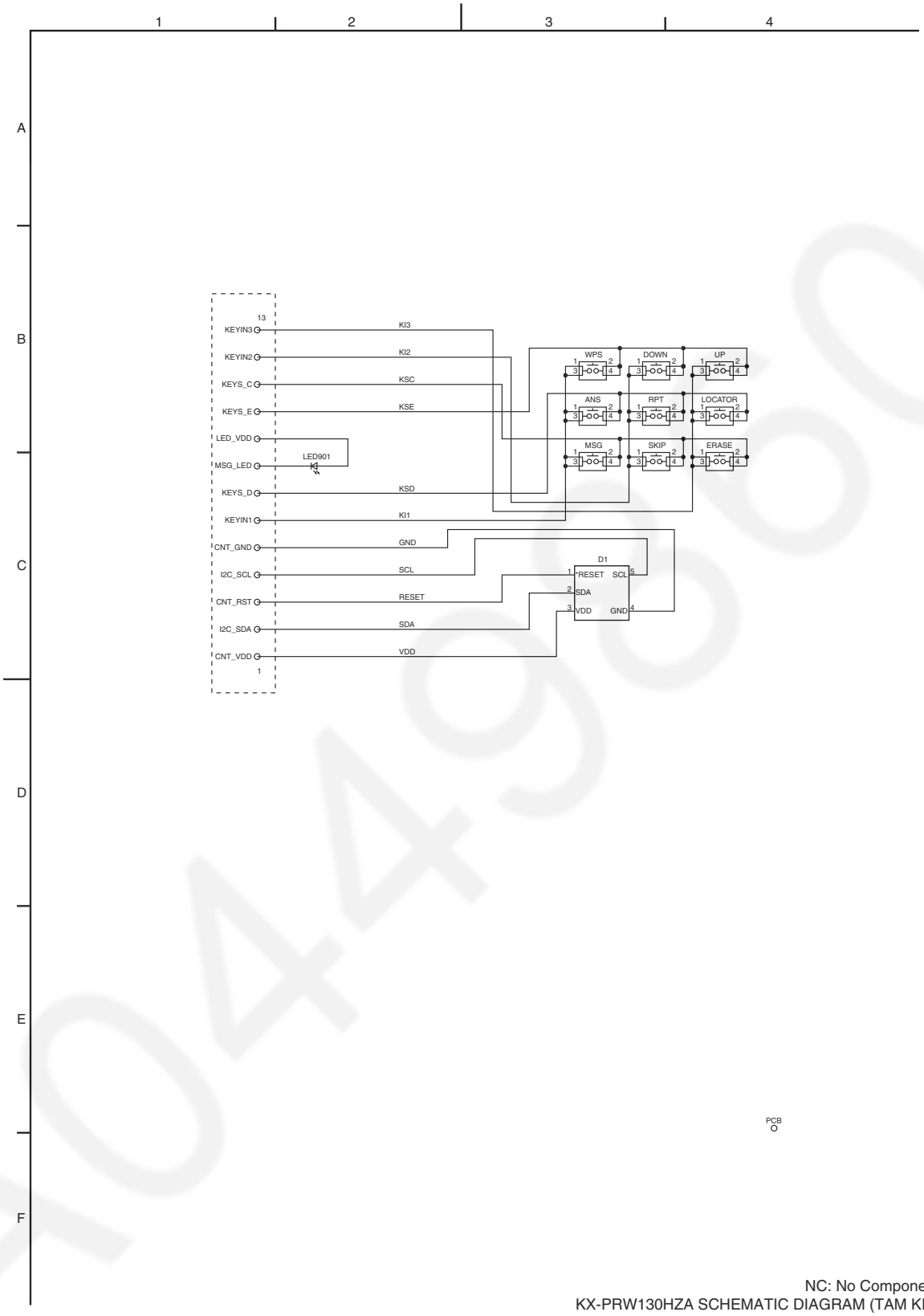
KX-PRW130H SCHEMATIC DIAGRAM (CPU) (1/2)



NC: No Components

KX-PRW130H SCHEMATIC DIAGRAM (CPU) (2/2)

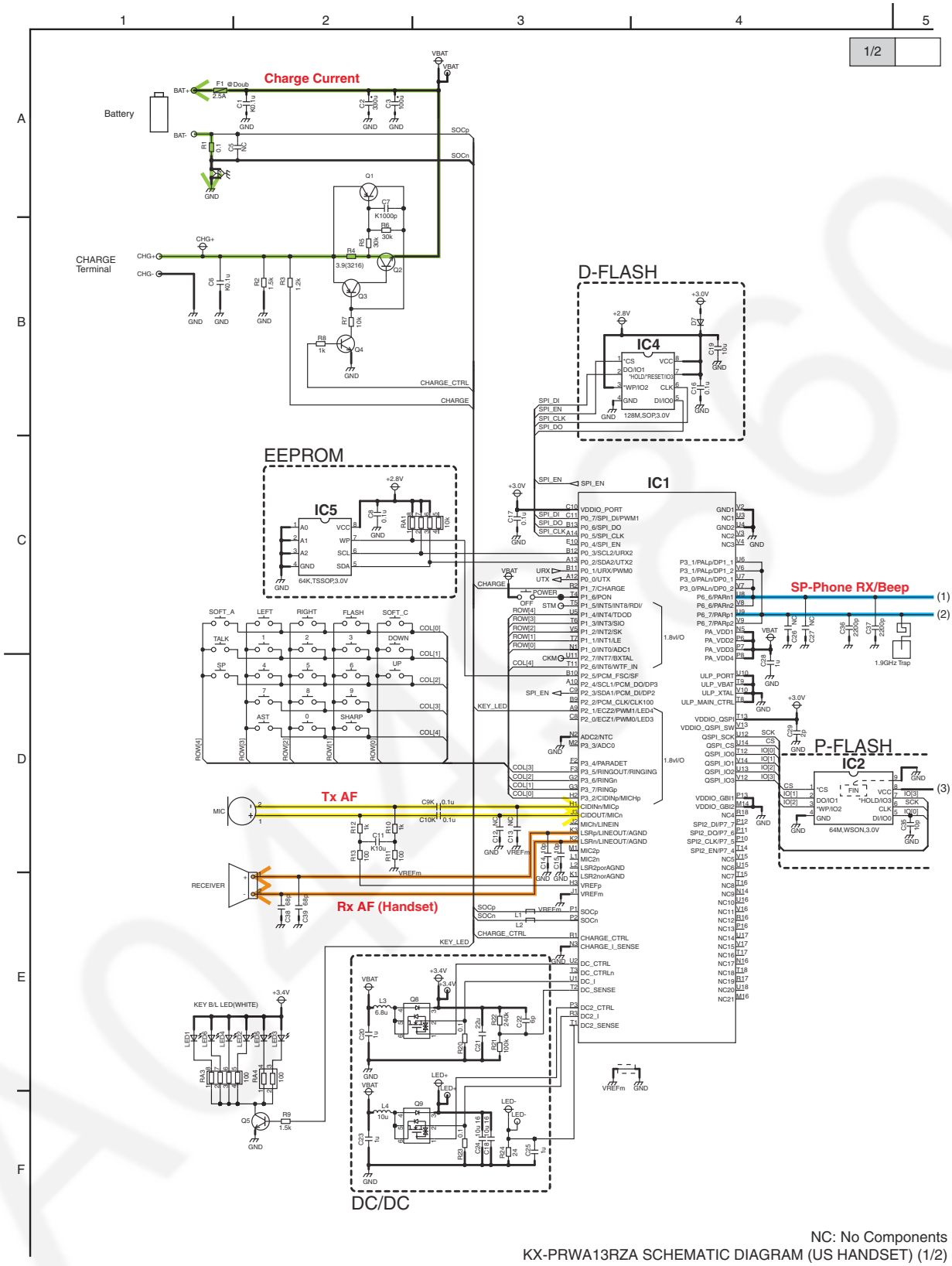
KX-PRW130 SCHEMATIC DIAGRAM (Base Unit (Main))



NC: No Components

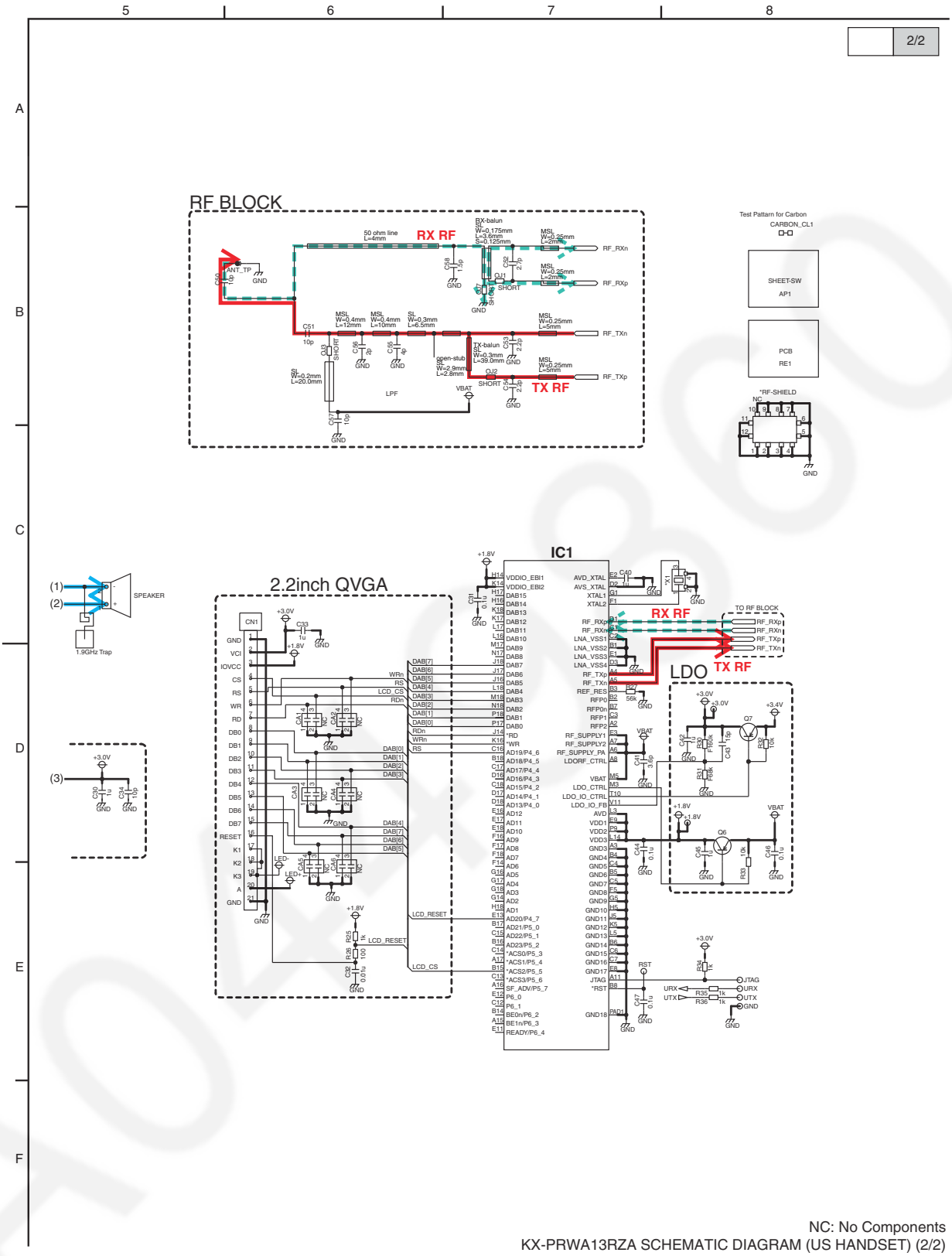
KX-PRW130HZA SCHEMATIC DIAGRAM (TAM KEY)

13.4. Handset



NC: No Components

KX-PRWA13RZA SCHEMATIC DIAGRAM (US HANDSET) (1/2)



NC: No Components

KX-PRWA13RZA SCHEMATIC DIAGRAM (US HANDSET) (2/2)

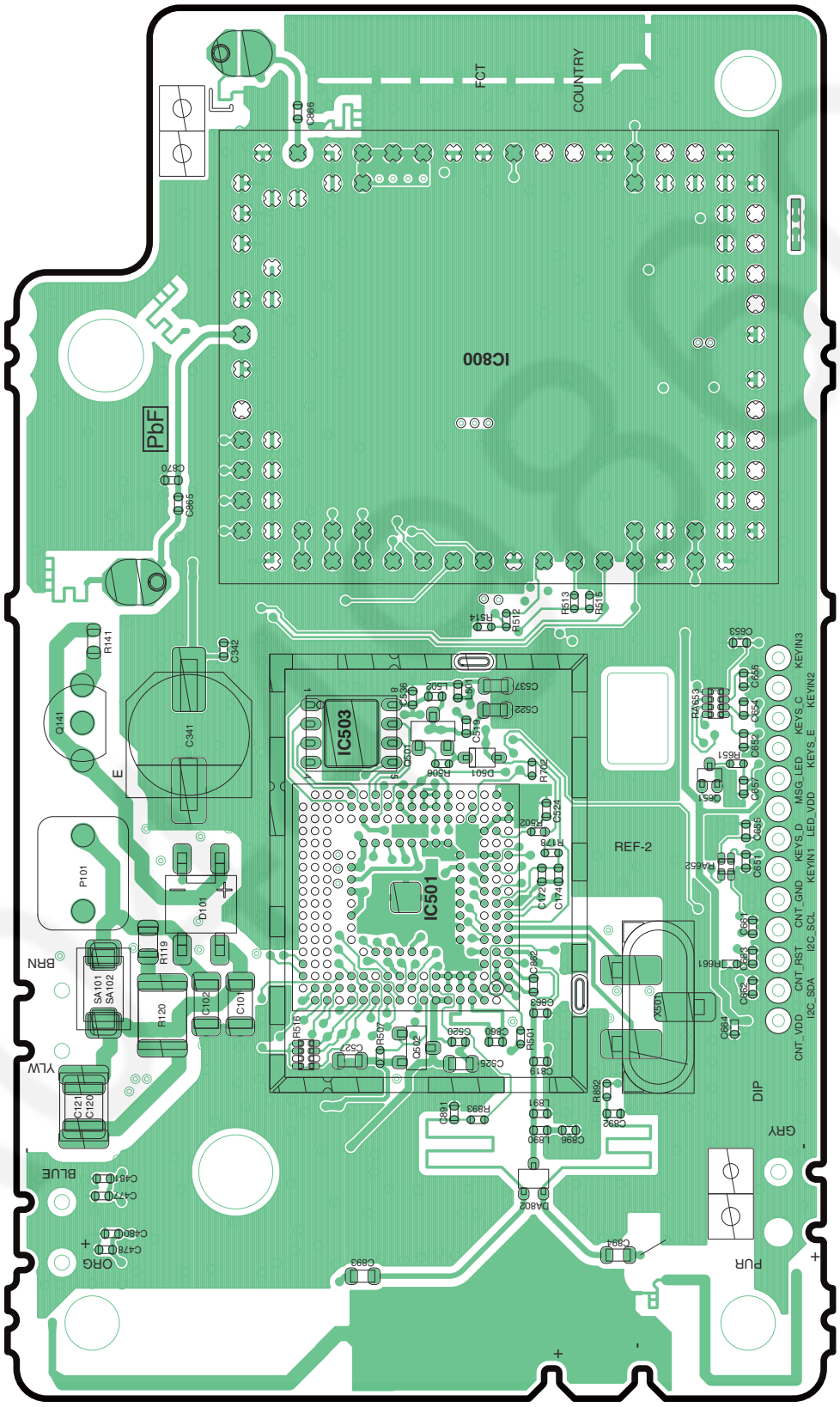
KX-PRWA13 SCHEMATIC DIAGRAM (Handset)

Memo

14 Printed Circuit Board

14.1. Base Unit (Main)

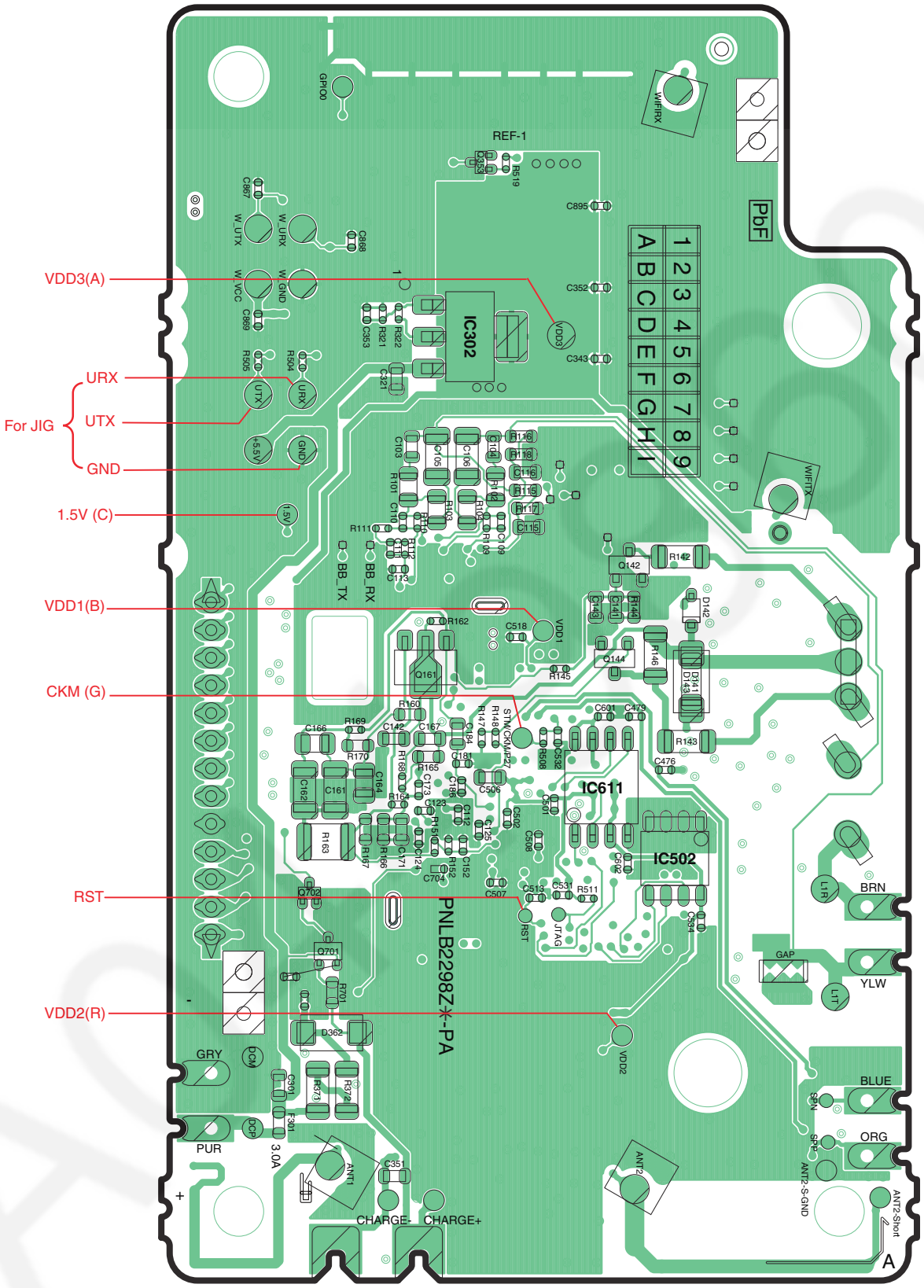
14.1.1. Component View



KX-PRW130 CIRCUIT BOARD (Main (Component View))

KX-PRW130 MAIN BOARD (Base Unit (Component View))

14.1.2. Bottom View



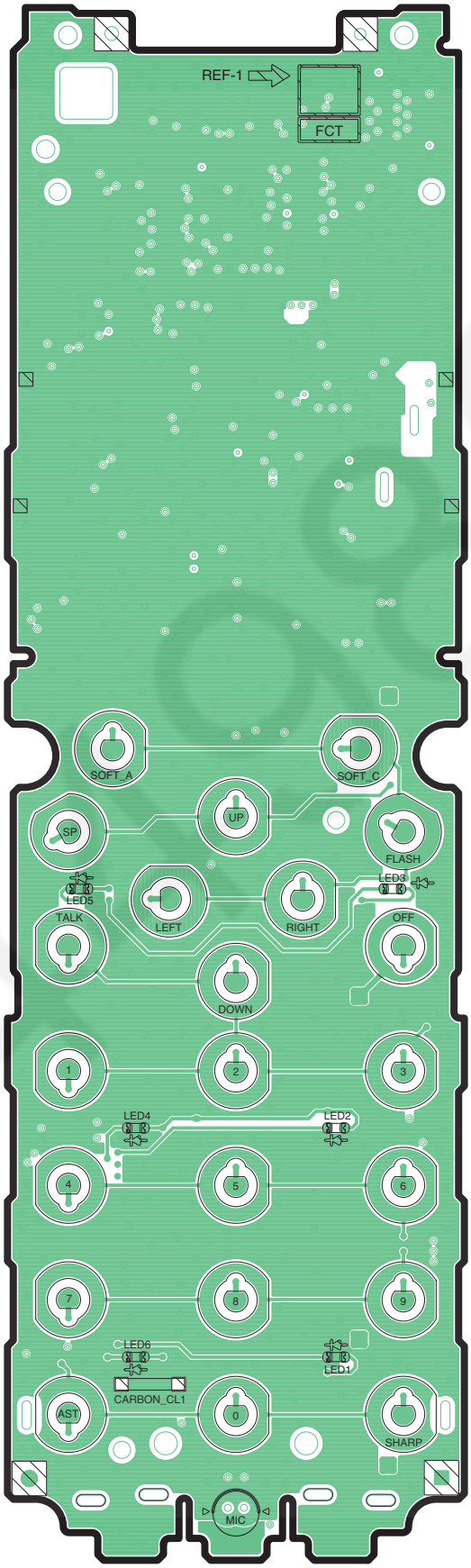
KX-PRW130 MAIN BOARD (Base Unit (Bottom View)

Note:

(A) - (R) is referred to **Check Point (Base Unit)** (P.40)

14.2. Handset

14.2.1. Component View

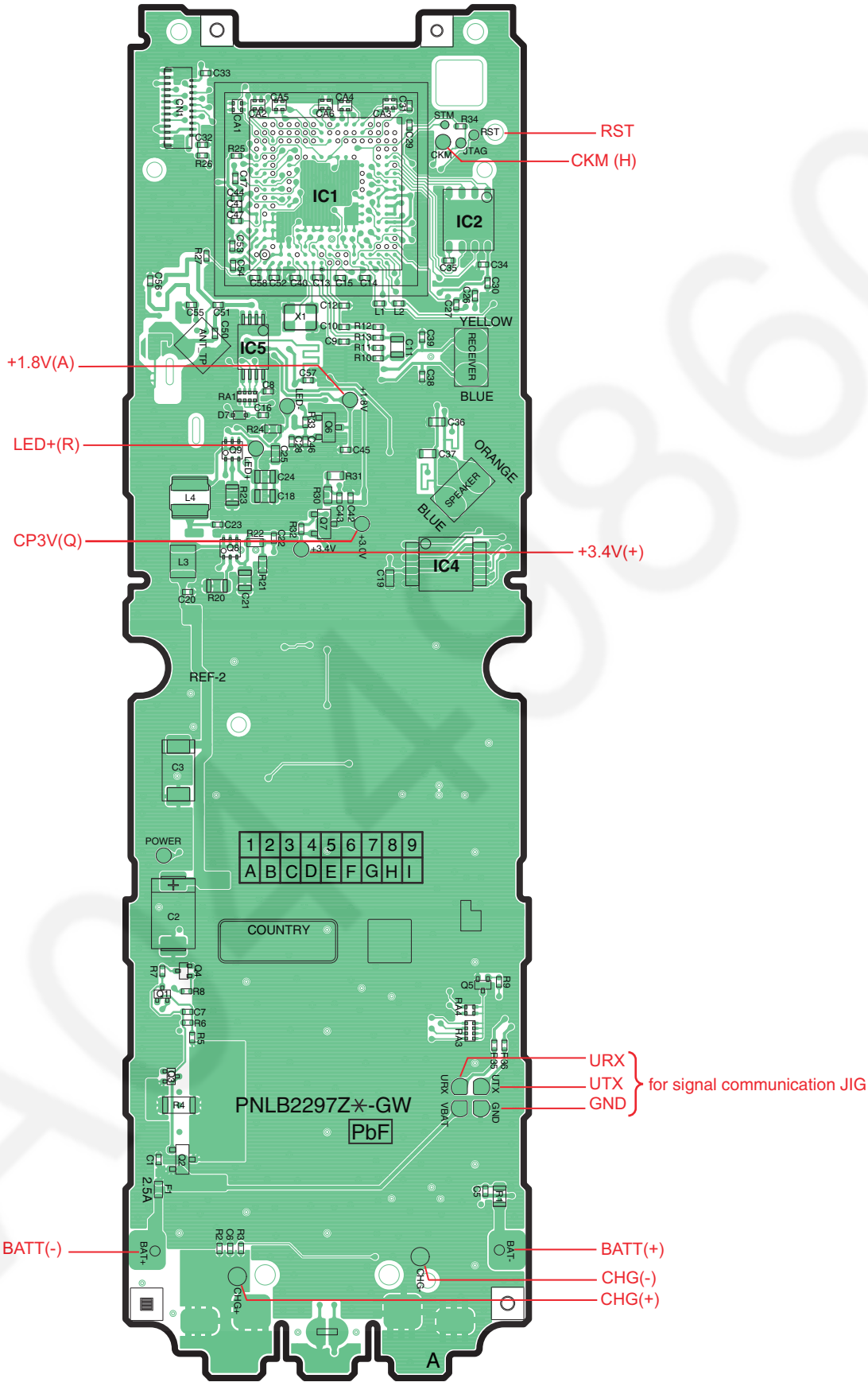


KX-PRWA13 CIRCUIT BOARD (Main (Component View))

KX-PRWA10 HANDSET BOARD (Component View)

Note:
(A) - (R) is referred to **Check Point (Handset)** (P.42)

14.2.2. Bottom View

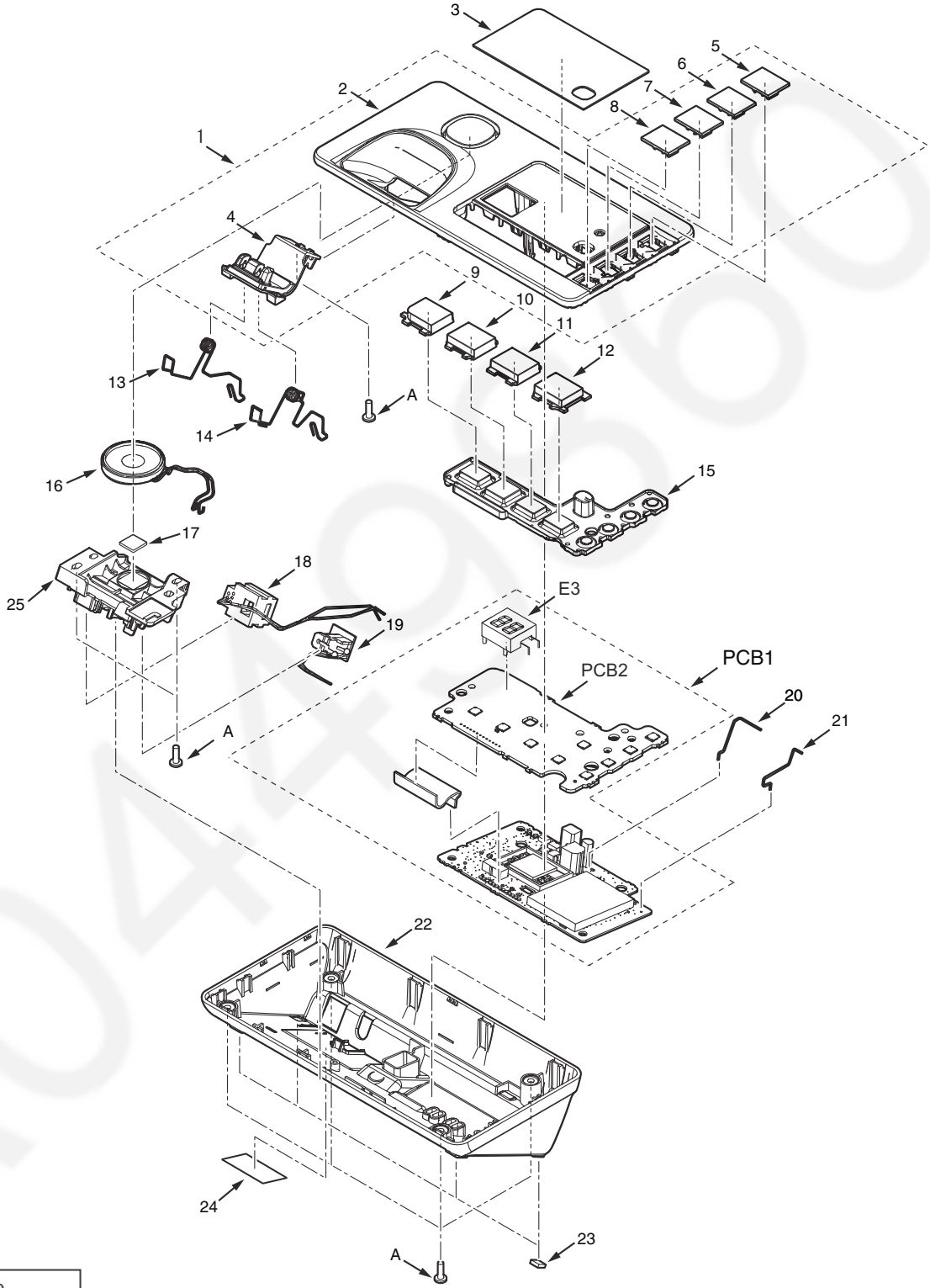


KX-PRWA10 HANDSET BOARD (Bottom View)

15 Exploded View and Replacement Parts List

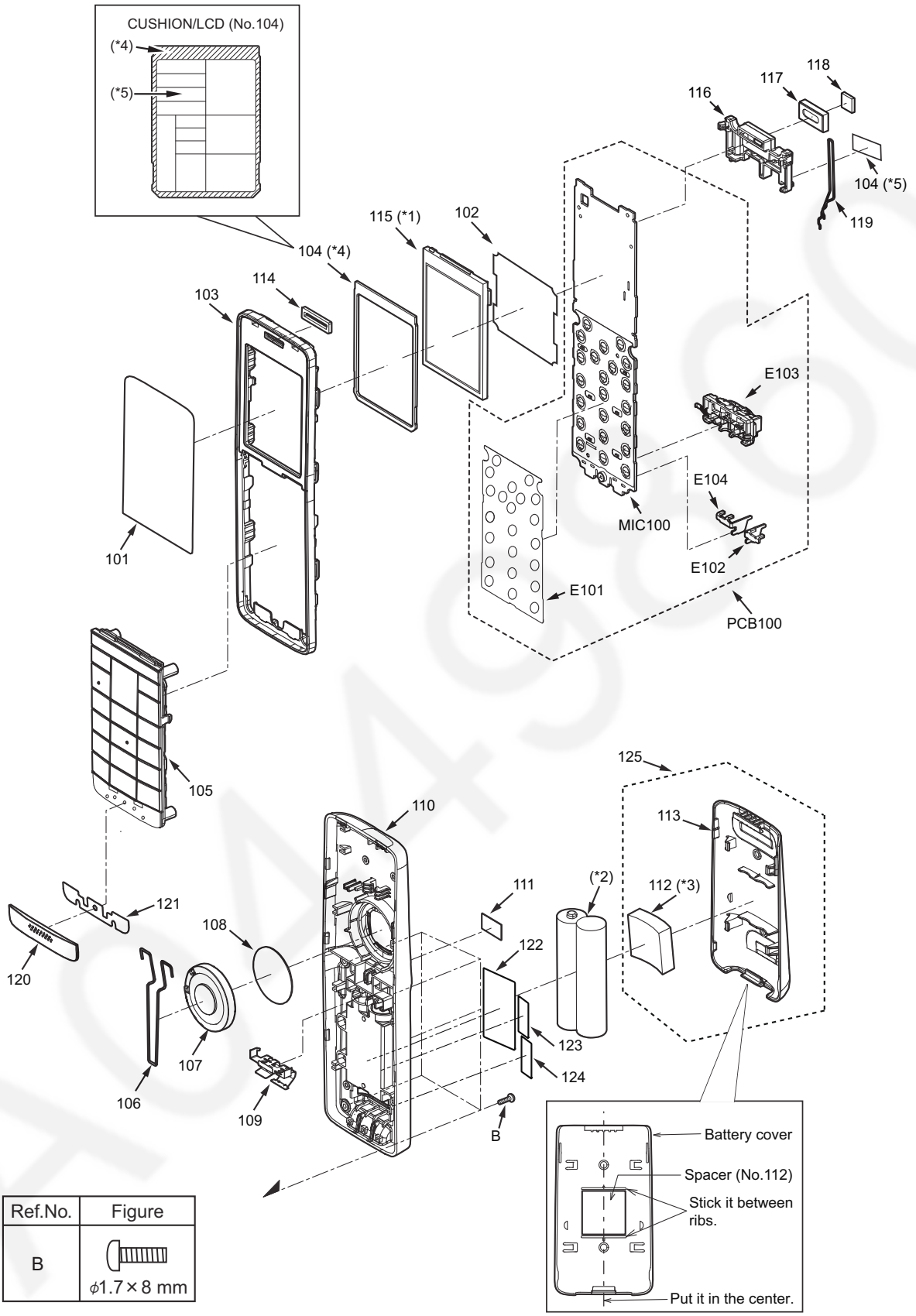
15.1. Cabinet and Electrical Parts (Base Unit)

15.1.1. KX-PRW130



Ref.No.	Figure
A	ϕ2.6 x 8mm

15.2. Cabinet and Electrical Parts (Handset)



Ref.No.	Figure
B	ϕ1.7 × 8 mm

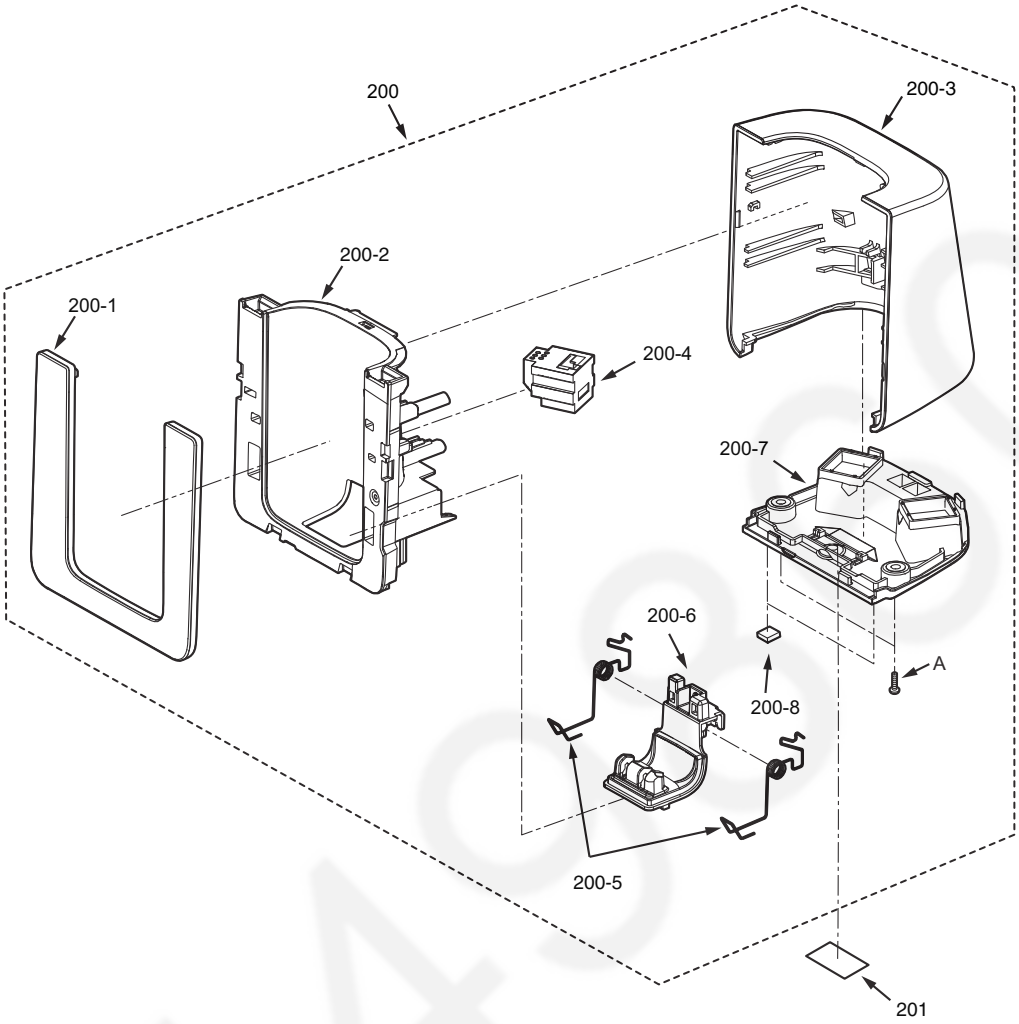
Note:

(*1) This cable is fixed by attaching. Refer to **How to Replace the Handset LCD** (P.51).

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

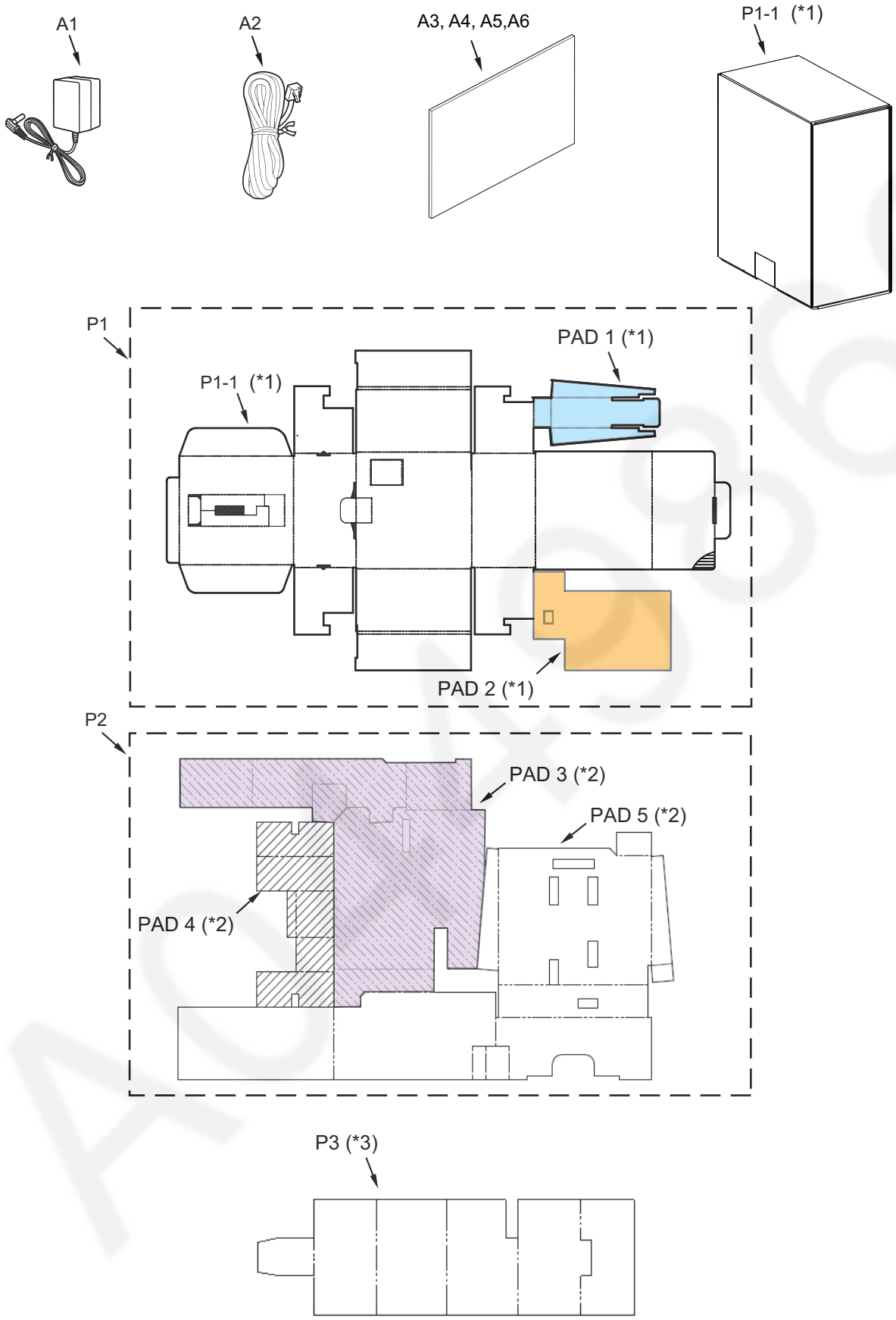
(*4) (*5) Attach the cushion LCD (No. 104) to the exact location described above.

15.3. Cabinet and Electrical Parts (Charger Unit)



Ref.No.	Figure
A	 ϕ2.6 × 8 mm

15.4. Accessories



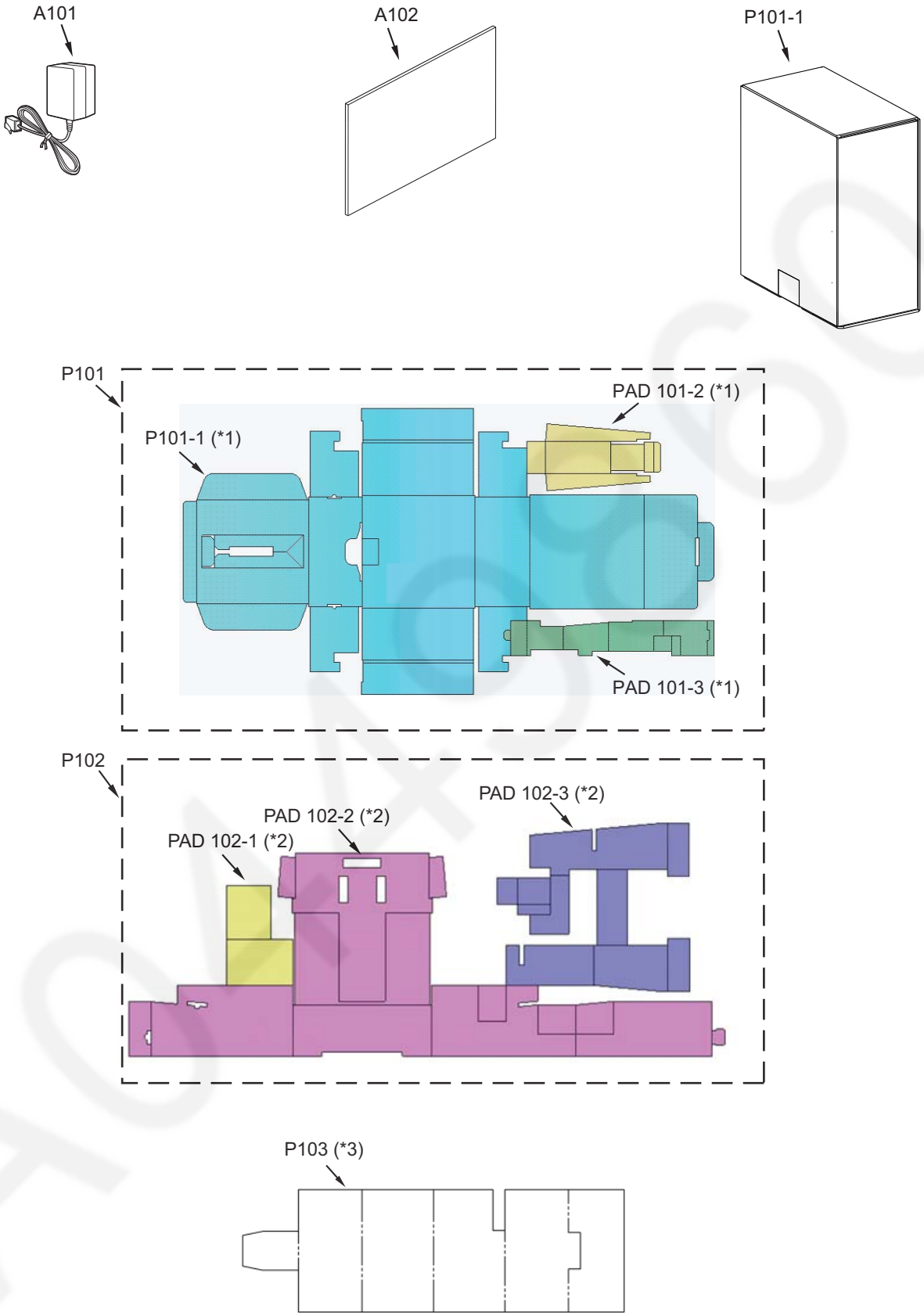
Note:

(*1) P1-1, Pad 1 and Pad 2 are a piece of P1.

(*2) Pad 3, Pad 4 and Pad 5 are a piece of P2.

(*3) This AC Adaptor is for Base Unit.

15.5. Accessories



Note:

(*1) P101-1, Pad 101-2 and Pad 101-3 are a piece of P101.

(*2) P102-1, Pad 102-2 and Pad 102-3 are a piece of P102.

(*3) This AC Adaptor is for Charger Unit.

15.6. Replacement Part List

1. RTL (Retention Time Limited)

   Note:

   The “RTL” marking indicates that its Retention Time is Limited.

   When production is discontinued, this item will continue to be available only for a specific period of time. This period of time depends on the type of item, and the local laws governing parts and product retention.

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

2. Important safety notice

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

3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.

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

5. RESISTORS & CAPACITORS

   Unless otherwise specified;

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

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

   *Type & Wattage of Resistor

Type

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

Wattage

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

*Type & Voltage Of Capacitor

Type

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

Voltage

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

15.6.1. Base Unit

15.6.1.1. Cabinet and Electrical Parts

15.6.1.1.1. KX-PRW130

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	1	PNYM1062Z1	CABINET BODY ASSY	S
	2	PNKM1535Z1	CABINET BODY	PS-HB
	3	PNGP1321Z1	PANEL PLATE	PC-HB
	4	PNKE1315Z1	GUIDE, CHARGE	PS-HB
	5	PNBC1544Z1	PUSH BUTTON	ABS-HB
	6	PNBC1545Z1	PUSH BUTTON	ABS-HB
	7	PNBC1546Z1	PUSH BUTTON	ABS-HB
	8	PNBC1547Z1	PUSH BUTTON	ABS-HB
	9	PNBC1548Z1	PUSH BUTTON	PMMA-HB
	10	PNBC1549Z1	PUSH BUTTON	PMMA-HB
	11	PNBC1550Z1	PUSH BUTTON	PMMA-HB
	12	PNBC1551Z1	PUSH BUTTON	PMMA-HB
	13	PNJT1193Z	CHARGE TERMINAL L	
	14	PNJT1194Z	CHARGE TERMINAL R	
	15	PNJK1218Z	KEYBOARDSWITCHRUBBER	
	16	L0AA02A00119	SPEAKER	
	17	PQHG10729Z	RUBBER PARTS	
	18	PQJJ1T039K	JACK, MODULAR	
	19	K2ECYZ000002	JACK/SOCKET	
	20	PNLA1126Z	ANTENNA, WIFI 1	
	21	PNLA1125Z	ANTENNA, WIFI 2	
	22	PNKF1319Z1	CABINET COVER	PS-HB
	23	PNHA1013Z	RUBBER PARTS, FOOT CUSHION	
	24	PNGT8074Z	NAME PLATE, AL	
	25	PNHR1937Z	JACK, HOLDER	PS-HB
	A	XTB26+8GFJ	TAPPING SCREW, STEEL	

15.6.1.2. Main P.C.Board Parts

Note:

(*1) When replacing IC501, X501, make the adjustment using PNZZPRW130. Refer to **How to download the data** (P.58) of **Things to Do after Replacing IC or X'tal**.

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

(*3) Backside of this IC has a ground plate. Refer to **How to Replace the Flat Package IC** (P.65).

(*4) Supplied IC is Flat Package Type.

(*5) When replacing IC800, confirm WiFi connection. Refer to **Confirm WiFi connection after replacing IC800** (P.62).

(*6) This IC is stored into MAC address for Wifi. When IC replacing the IC, if replace it with PCB.

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB1	PNWP1PRW130H	PC BOARD W/COMPONENT	
	IC302	C0CBAYG00016	IC	
	IC501	C1CB00003611	IC (*1) (*3) (*4)	
	IC502	PNWP1PRW130H	PC BOARD W/COMPONENT (*6)	
	IC503	PNWI2PRW130H	IC (FLASH) (*3) (*4)	
	IC611	PNWI3PRW130H	IC (FLASH)	
	IC800	PNWP2PRW130H	PC BOARD W/COMPONENT (*5)	
	C101	F1K2H681A008	CERAMIC CAPACITOR	S
	C102	F1K2H681A008	CERAMIC CAPACITOR	S
	C103	ECUV1H103KBV	0.01	S
	C104	ECUV1H103KBV	0.01	
	C105	F1K2H681A008	CERAMIC CAPACITOR	S
	C106	F1K2H681A008	CERAMIC CAPACITOR	S
	C109	ECUE1H821KBQ	820p	
	C110	ECUE1H821KBQ	820p	
	C111	ECUE1A333KBQ	0.033	
	C112	ECUE1H100DCQ	10p	
	C113	ECUE1A823KBQ	0.082	
	C115	ECUV1C104KBV	0.1	
	C116	ECUV1C104KBV	0.1	
	C123	ECUE1H100DCQ	10p	
	C124	ECUE1H100DCQ	10p	
	C125	ECUE1H100DCQ	10p	
	C142	ECUV1H103KBV	0.01	
	C152	ECUE1C103KBQ	0.01	
	C161	F1K1E1060001	CERAMIC CAPACITOR	
	C167	ECUV1H102KBV	0.001	
	C171	ECUV1C223KBV	0.022	
	C172	ECUE1H100DCQ	10p	
	C173	ECUE1A104KBQ	0.1	
	C174	ECUE1H222KBQ	0.0022	
	C184	ECUV1A105KBV	1	
	C186	ECUE1H561KBQ	560p	
	C301	ECUV1C104KBV	0.1	
	C321	ECUV1C105KBV	1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C341	F2G0J102A060	1000	
	C342	ECUE1A104KBQ	0.1	
	C343	ECUE1H7R0DCQ	7	
	C351	ECUV1C105KBV	1	
	C352	ECUE1H7R0DCQ	7	
	C353	ECUE1H101JCQ	100p	
	C476	ECUE1H100DCQ	10p	
	C477	ECUE1H222KBQ	0.0022	
	C478	ECUE1H222KBQ	0.0022	
	C479	ECUE1H100DCQ	10p	
	C480	ECUE1H7R0DCQ	7	
	C481	ECUE1H7R0DCQ	7	
	C501	ECUE1A104KBQ	0.1	
	C502	ECUE1A104KBQ	0.1	
	C506	ECUV0J225KBV	2.2	
	C507	ECUE1H100DCQ	10p	
	C508	ECUE1C104KBQ	0.1	
	C513	ECUE1C104KBQ	0.1	
	C519	ECUE1A104KBQ	0.1	
	C520	ECUE1H100DCQ	10p	
	C522	F1H1A105A036	CERAMIC CAPACITOR	
	C524	ECUE1A104KBQ	0.1	
	C525	F1H1A105A036	CERAMIC CAPACITOR	
	C527	F1H1A105A036	CERAMIC CAPACITOR	
	C531	ECUE1C104KBQ	0.1	
	C532	ECUE1H100DCQ	10p	
	C534	ECUE1C104KBQ	0.1	
	C536	ECUE1H100DCQ	10p	
	C537	F1H1A105A036	CERAMIC CAPACITOR	
	C601	ECUE1A104KBQ	0.1	
	C602	ECUE1H7R0DCQ	7	
	C661	ECUE1H3R0CCQ	3	
	C662	ECUE1H3R0CCQ	3	
	C663	ECUE1H3R0CCQ	3	
	C664	ECUE1A104KBQ	0.1	
	C704	ECUE0J105KBQ	1	
	C819	ECUE1H100DCQ	10p	
	C860	F1G1HR70A765	CERAMIC CAPACITOR	
	C862	F1G1H1R2A765	CERAMIC CAPACITOR	
	C863	F1G1H1R5A765	CERAMIC CAPACITOR	
	C865	ECUE1H7R0DCQ	7	
	C866	ECUE1H7R0DCQ	7	
	C867	ECUE1H100DCQ	10p	
	C868	ECUE1H100DCQ	10p	
	C869	ECUE1H100DCQ	10p	
	C891	ECUE1H100DCQ	10p	S
	C892	ECUE1H100DCQ	10p	S
	C893	ECUV1H100DCV	10p	
	C894	ECUV1H100DCV	10p	
	C895	ECUE1H7R0DCQ	7	
	C896	F1G1H1R5A765	CERAMIC CAPACITOR	
	D101	B0EDER000009	DIODE(SI)	S
	D142	DY2J25000L	TRANSISTOR(SI)	
	D362	B0ECKM000008	DIODE(SI)	
	D501	1SS355	DIODE(SI)	S
	DA802	B0DDCD000001	DIODE(SI)	
	F301	K5H302Y00003	FUSE	!
	L502	ERJ2GE0R00	0	S
	L890	G1C1N8Z00006	COIL	
	L891	G1C1N5Z00007	COIL	
	P101	D4DAY220A022	THERMISTOR	
	Q141	B1ACGP000008	TRANSISTOR(SI)	
	Q142	B1ABDM000001	TRANSISTOR(SI)	
	Q161	DSC7003S0L	TRANSISTOR(SI)	
	Q353	2SC6054JSL	TRANSISTOR(SI)	S
	Q501	B1ADGE000012	TRANSISTOR(SI)	
	Q502	B1ADGE000012	TRANSISTOR(SI)	
	Q651	DRC9113Z0L	TRANSISTOR(SI)	
	Q701	2SA1576S	TRANSISTOR(SI)	S
	Q702	B1GBCFYY0020	TRANSISTOR(SI)	S
	R101	PQ4R10XJ475	4.7m	S
	R102	PQ4R10XJ475	4.7m	S
	R103	PQ4R10XJ184	180k	S
	R104	PQ4R10XJ184	180k	S
	R109	ERJ2GEJ823	82k	S
	R110	ERJ2GEJ823	82k	S
	R111	ERJ2GEJ392	3.9k	S
	R112	ERJ2GEJ124	120k	S
	R115	ERJ3GEYJ106	10m	S
	R116	ERJ3GEYJ106	10m	S
	R117	ERJ3GEYJ184	180k	S
	R118	ERJ3GEYJ184	180k	S
	R141	ERJ3GEYJ104	100k	S
	R142	PQ4R18XJ272	2.7k	S
	R145	ERJ2GEJ222	2.2k	S
	R151	ERJ2GEJ104	100k	S
	R152	ERJ2GEJ134X	130k	S
	R160	ERJ3GEYJ821	820	S
	R162	ERJ2GEJ473	47k	S
	R163	D0GG390JA007	39	
	R164	ERJ2GEJ272	2.7k	S
	R165	ERJ3GEYJ273	27k	S
	R166	ERJ3GEYJ822	8.2k	S
	R168	ERJ2GEJ472X	4.7k	S
	R178	ERJ2GEJ332	3.3k	S
	R321	ERJ2RKF1800	180	
	R322	ERJ2RKF1100	110	S
	R371	ERJ8GEYJ1R0	1	S
	R372	ERJ8GEYJ1R0	1	S
	R501	ERJ2RKF5602	56k	
	R502	ERJ2GEJ222	2.2k	S
	R504	ERJ2GEJ102	1k	S
	R505	ERJ2GEJ102	1k	S
	R506	ERJ2GEJ103	10k	S
	R507	ERJ2GEJ103	10k	S
	R508	ERJ2GEJ100	10	S
	R511	ERJ2GEJ102	1k	S
	R512	ERJ2GEJ102	1k	S
	R513	ERJ2GEJ102	1k	S
	R514	ERJ2GEJ122	1.2k	S
	R515	ERJ2GEJ122	1.2k	S
	R516	EXB28V103	COMPONENTS PARTS	
	R519	ERJ2GEJ102	1k	S
	R651	ERJ2GEJ471	470	S
	R661	ERJ2GEJ103	10k	S
	R701	ERJ3GEYJ332	3.3k	S
	R702	ERJ2GEJ103	10k	S
	R892	ERJ2GEJ221	220	S
	R893	ERJ2GEJ221	220	S
	RA652	EXB24V102JX	COMPONENTS PARTS	
	RA653	D1H810240004	COMPONENTS PARTS	S
	SA101	J0LE00000047	VARISTOR	
	X501	H0J103500037	CRYSTAL OSCILLATOR (*1)	

15.6.1.3. Operation P.C.Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	ANS	K0H1BA000578	SPECIAL SWITCH	
	DOWN	K0H1BA000578	SPECIAL SWITCH	
	E3	B3CAT0000004	DIODE(SI)	
	ERASE	K0H1BA000578	SPECIAL SWITCH	
	LED901	B3AAB0000347	DIODE(SI)	
	LOCATO	K0F111A00472	PUSH SWITCH	
	MSG	K0H1BA000578	SPECIAL SWITCH	
	PCB2	PNWP3PRW130H	Operation PC BOARD W/COMPONENT (RTL)	
	RPT	K0H1BA000578	SPECIAL SWITCH	
	SKIP	K0H1BA000578	SPECIAL SWITCH	
	UP	K0H1BA000578	SPECIAL SWITCH	
	WPS	K0H1BA000578	SPECIAL SWITCH	

15.6.2. Handset

15.6.2.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	101	PNGP1295Z1	PANEL	PMMA-HB
	102	PNHX1698Z	PLASTIC PARTS	
	103	PNKM1492Z1	CABINET BODY	PC+ABS-HB
	104	PNYE1117Y	SPACER	
	105	PNYT1035Z1	PUSH BUTTON	S
	106	PNMH1286Z	GUIDE	
	107	L0AA02A00119	SPEAKER	
	108	PNHS1502Z	SPACER	
	109	PNJC1018Z	BATTERY TERMINAL	
	110	PNKF1286Z1	CABINET COVER	PC+ABS-HB
	111	PNHX1687Z	TAPE	
	112	PNHS1466Z	SPACER	
	113	PNKK1083Z1	DOOR-LID	PC+ABS-HB
	114	PNHG1229Z	SPACER	
	115	L5EDDYY00532	LIQUID CRYSTAL DISPLAY	
	116	PNHR1850Z	GUIDE	ABS-HB
	117	L0AC01C00004	SPEAKER	
	118	PNHG1181Z	RUBBER PARTS	
	119	PNLA1110Z	ANTENNA	
	120	PNGG1343Z1	PANEL	ABS-HB
	121	PNHS1520Z	TAPE	
	122	PNQT2880Z	INDICATION PLATE-LABEL	
	123	PNQT2006Z	INDICATION PLATE-LABEL	
	124	PNGT8075Z	NAME PLATE, AL	
	125	PNYNPRSA10WR	DOOR-LID ASSY	PC+ABS-HB

15.6.2.2. Main P.C.Board Parts

Note:
(*1) Reconfirm the model No. written on the handset's name plate when replacing PCB100. Because the model No. of the optional handset may differ from the included handset.
(*2) When replacing IC2, IC3, IC5 or X1, make the adjustment using PNZZPRW130. Refer to **Handset** (P.59) of **Things to Do after Replacing IC or X'tal**.
(*3) When removing ZA1, use special tools (ex. Hot air disordering tool).
(*4) When replacing the handset LCD, See **How to Replace the Handset LCD** (P.51).
(*5) Backside of this IC has a ground plate. Refer to **How to Replace the Flat Package IC** (P.65).
(*6) Supplied IC is Flat Package Type.

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB100	PNWPPRWA13R	PC BOARD W/COMPONENT (*1)	
	IC1	C1CB00003611	IC (*2) (*4) (*5)	
	IC2	PNWI2PRWA13R	IC (FLASH)	
	IC4	C3FBQY000103	IC (FLASH)	
	IC5	PNWI1PRWA13R	IC (EEPROM) (*2)	
	C1	ECUE1A104KBQ	0.1	S
	C10	ECUE1A104KBQ	0.1	
	C11	PQCUV0J106KB	10	
	C14	ECUE1H100DCQ	10p	
	C15	ECUE1H100DCQ	10p	
	C16	ECUE1A104KBQ	0.1	
	C17	ECUE1C104KBQ	0.1	
	C18	F1J1C106A059	CERAMIC CAPACITOR	
	C19	ECJ1VB0G106M	10	S
	C2	F4Z0J337A008	NIOBIUM OXIDE CAPACITOR	
	C20	ECUE0J105KBQ	1	
	C21	F1J0J2260002	CERAMIC CAPACITOR	
	C22	ECUE1H6R0DCQ	6	
	C23	ECUE0J105KBQ	1	
	C24	F1J1C106A059	CERAMIC CAPACITOR	
	C25	ECUV0J105KBV	1	
	C28	ECUE0J105KBQ	1	
	C29	F1G1H2R0A765	CERAMIC CAPACITOR	
	C3	F4Z0J107A002	ELECTROLYTIC CAPACITOR	
	C30	ECUE0J105KBQ	1	
	C31	ECUE1C104KBQ	0.1	
	C32	ECUE1E103KBQ	0.01	
	C33	ECUE0J105KBQ	1	
	C34	ECUE1H100DCQ	10p	
	C35	ECUE1H100DCQ	10p	
	C36	ECUV1H222KBV	0.0022	
	C37	ECUV1H222KBV	0.0022	
	C38	ECUE1H680JCQ	68p	
	C39	ECUE1H680JCQ	68p	
	C40	ECUE0J105KBQ	1	
	C41	F1G1H3R6A765	CERAMIC CAPACITOR	
	C42	ECUE0J105KBQ	1	
	C43	ECUE1H150JCQ	15p	
	C44	ECUE1C104KBQ	0.1	
	C45	ECUE0J105KBQ	1	
	C46	ECUE1C104KBQ	0.1	
	C47	ECUE1C104KBQ	0.1	
	C50	ECUE1H100DCQ	10p	
	C51	ECUE1H100DCQ	10p	
	C52	F1G1H2R7A765	CERAMIC CAPACITOR	
	C53	F1G1H2R2A765	CERAMIC CAPACITOR	
	C54	F1G1H2R2A765	CERAMIC CAPACITOR	
	C55	F1G1H4R0A765	CERAMIC CAPACITOR	
	C56	F1G1H2R0A765	CERAMIC CAPACITOR	
	C57	ECUE1H100DCQ	10p	
	C58	F1G1H1R5A765	CERAMIC CAPACITOR	
	C6	ECUE1A104KBQ	0.1	
	C7	ECUE1H102KBQ	0.001	
	C8	ECUE1C104KBQ	0.1	
	C9	ECUE1A104KBQ	0.1	
	CN1	K1MY21BA0487	CONNECTOR	
	D7	B0JCDD000001	DIODE(SI)	
	E101	PNJE1179Z	SPECIAL SWITCH	
	E102	PNJT1164Z	TERMINAL-TERMINAL PLATE	
	E103	PNVE1017Z	BATTERY TERMINAL	
	E104	PNJT1163Z	TERMINAL-TERMINAL PLATE	
	F1	K5H252Y00002	FUSE	!
	L1	J0JDC0000045	IC FILTER	
	L2	J0JDC0000045	IC FILTER	
	L3	G1C6R8MA0203	COIL	
	L4	G1C100MA0395	COIL	
	LED1	B3AFB0000570	DIODE(SI)	
	LED2	B3AFB0000570	DIODE(SI)	
	LED3	B3AFB0000570	DIODE(SI)	
	LED4	B3AFB0000570	DIODE(SI)	
	LED5	B3AFB0000570	DIODE(SI)	
	LED6	B3AFB0000570	DIODE(SI)	
	MIC100	L0CBAY000152	BUILTIN-MICROPHONE	
	Q1	B1ADCF000040	TRANSISTOR(SI)	
	Q2	B1ABGE000011	TRANSISTOR(SI)	
	Q3	B1ADCF000040	TRANSISTOR(SI)	
	Q4	2SC6054JSL	TRANSISTOR(SI)	S
	Q5	2SC6054JSL	TRANSISTOR(SI)	S
	Q6	B1ADGE000012	TRANSISTOR(SI)	
	Q7	B1ADGE000012	TRANSISTOR(SI)	
	Q8	FM6K62010L	TRANSISTOR(SI)	
	Q9	FM6K62010L	TRANSISTOR(SI)	
	R1	ERJ6RSJR10V	0.1	
	R10	ERJ2GEJ102	1k	S
	R11	ERJ2GEJ101	100	S
	R12	ERJ2GEJ102	1k	S
	R13	ERJ2GEJ101	100	S
	R2	ERJ2GEJ152	1.5k	S
	R20	ERJ6RSJR10V	0.1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R21	ERJ3EKF1003	METAL FILM OXIDE RESISTOR	
	R22	ERJ3EKF2403	METAL FILM OXIDE RESISTOR	
	R23	ERJ6RSJR10V	0.1	
	R24	ERJ3EKF24R0	METAL FILM OXIDE RESISTOR	
	R25	ERJ2GEJ102	1k	S
	R26	ERJ2GEJ101	100	S
	R27	D0GA563ZA006	56k	
	R3	ERJ2GEJ122	1.2k	S
	R30	ERJ3EKF1603	METAL FILM OXIDE RESISTOR	
	R31	ERJ3EKF6802	METAL FILM OXIDE RESISTOR	
	R32	ERJ2GEJ103	10k	S
	R33	ERJ2GEJ103	10k	S
	R34	ERJ2GEJ102	1k	S
	R35	ERJ2GEJ102	1k	S
	R36	ERJ2GEJ102	1k	S
	R4	ERJ8GEYJ3R9	3.9	S
	R5	ERJ2GEJ303	30k	
	R6	ERJ2GEJ303	30k	S
	R7	ERJ2GEJ103	10k	S
	R8	ERJ2GEJ102	1k	S
	R9	ERJ2GEJ152	1.5k	S
	RA1	EXB28V103	COMPONENTS PARTS	
	RA3	EXB28V101JX	COMPONENTS PARTS	
	RA4	EXB24V101JX	SOLID RESISTOR	
	X1	H0J103500052	CRYSTAL OSCILLATOR (*2)	

15.6.3. Charger Unit

15.6.3.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	200	PNLC1047ZW	CHARGER UNIT ASS'Y without NAME PLATE (RTL)	
	200-1	PNGP1294Z1	PANEL	S
	200-2	PNKM1504Z1	CABINET BODY	ABS-HB
	200-3	PNKF1287Z1	CABINET COVER	S
	200-4	PNJJ021001Z	JACK/SOCKET	
	200-5	PNJT1168Z	TERMINAL-TERMINAL PLATE	
	200-6	PNKE1295Z1	CASE/COVER	S
	200-7	PNKE1297Y1	CABINET COVER	PS-HB
	200-8	PQHA10023Z	RUBBER PARTS	
	201	PNGT7891Z	NAME PLATE, AL	

15.6.4. Accessories

Note:

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

15.6.4.1. KX-PRW130W

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	A1	PNLV2360Z	AC ADAPTOR (for Base Unit)	
	A3	PNQX6458Z	INSTRUCTION BOOK	
	A4	PNQX6457Z	INSTRUCTION BOOK (*1)	
	A5	PNQW2611Z	LEAFLET	
	A6	PNQW3426Z	LEAFLET	
	A2	PQJA10075Z	CORD, TELEPHONE	
	P1	PNPK3784001Z	GIFT BOX	
	P2	PNPD1843Z	CUSHION	
	P3	PNPD1782Z	CUSHION	

15.6.4.2. KX-PRWA13W

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	A101	PNLV233Z	AC ADAPTOR (for charger)	
	A102	PNQX6459Z	INSTRUCTION BOOK (*1)	
	P101	PNPK3711006Z	GIFT BOX	
	P102	PNPD1788Z	CUSHION	
	P103	PNPD1782Z	CUSHION	

15.6.5. Screws

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	A	XTB26+8GFJ	TAPPING SCREW, STEEL	
	B	XQH17+BG8FJ	TAPPING SCREW	

15.6.6. Fixtures and Tools

Note:

(*1) See **Equipment Required** (P.52), and **The Setting Method of JIG (Handset)** (P.55).

(*2) When replacing the Handset LCD, See **How to Replace the Handset LCD** (P.51).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
		PQZZ1CD300E	JIG CABLE (*1)	
		PNZZPRW130	BATCH FILE CD-ROM (*1)	

MO
KXPRW130W
KXPRWA13W