ORDER NO. KM41108472CE
F13

Service Manual

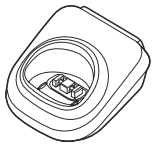
Telephone Equipment

Model No. KX-TG9471B
KX-TG9472B
KX-TGA939T

Caller ID Compatible 2LINE DECT 6.0

KX-TGA939T
(Portable)

KX-TG9471B
(Base Unit)



(Charger Unit)

Digital Corded/Cordless Answering System

B: Black Version
(for U.S.A.)

Configuration for each model

Model No	Base Unit	Portable	Charger Unit	Expandable
KX-TG9471	1 (TG9471)	1 (TGA939)	1	Up to 6
KX-TG9472	1 (TG9471)	2 (TGA939)	2	Up to 6
KX-TGA939*		1 (TGA939)	1	

* KX-TGA939 is also an optional accessory, which contains a portable 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:

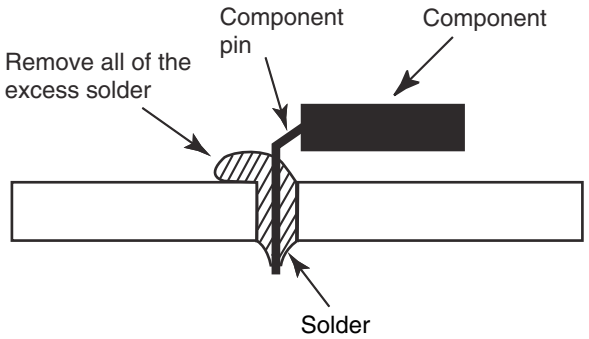
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

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).

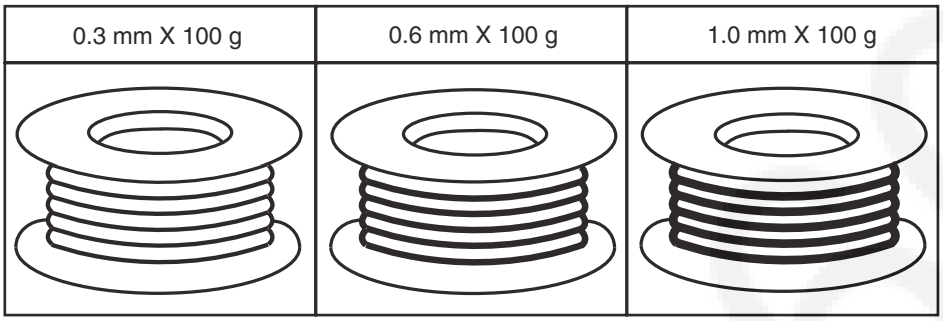


(Slice View)

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.



2.3. Discarding of P. C. Board

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

3 Specifications

■ **Standard:**
DECT 6.0 (Digital Enhanced Cordless Telecommunications 6.0)

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

■ **Frequency range:**
1.92 GHz to 1.93 GHz

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

■ **Channel spacing:**
1,728 kHz

■ **Bit rate:**
1,152 kbit/s

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

■ **RF transmission power:**
115 mW (max.)

■ **Voice coding:**
ADPCM 32 kbit/s

■ **Interface:**
USB 2.0 Full speed (12 Mbps)

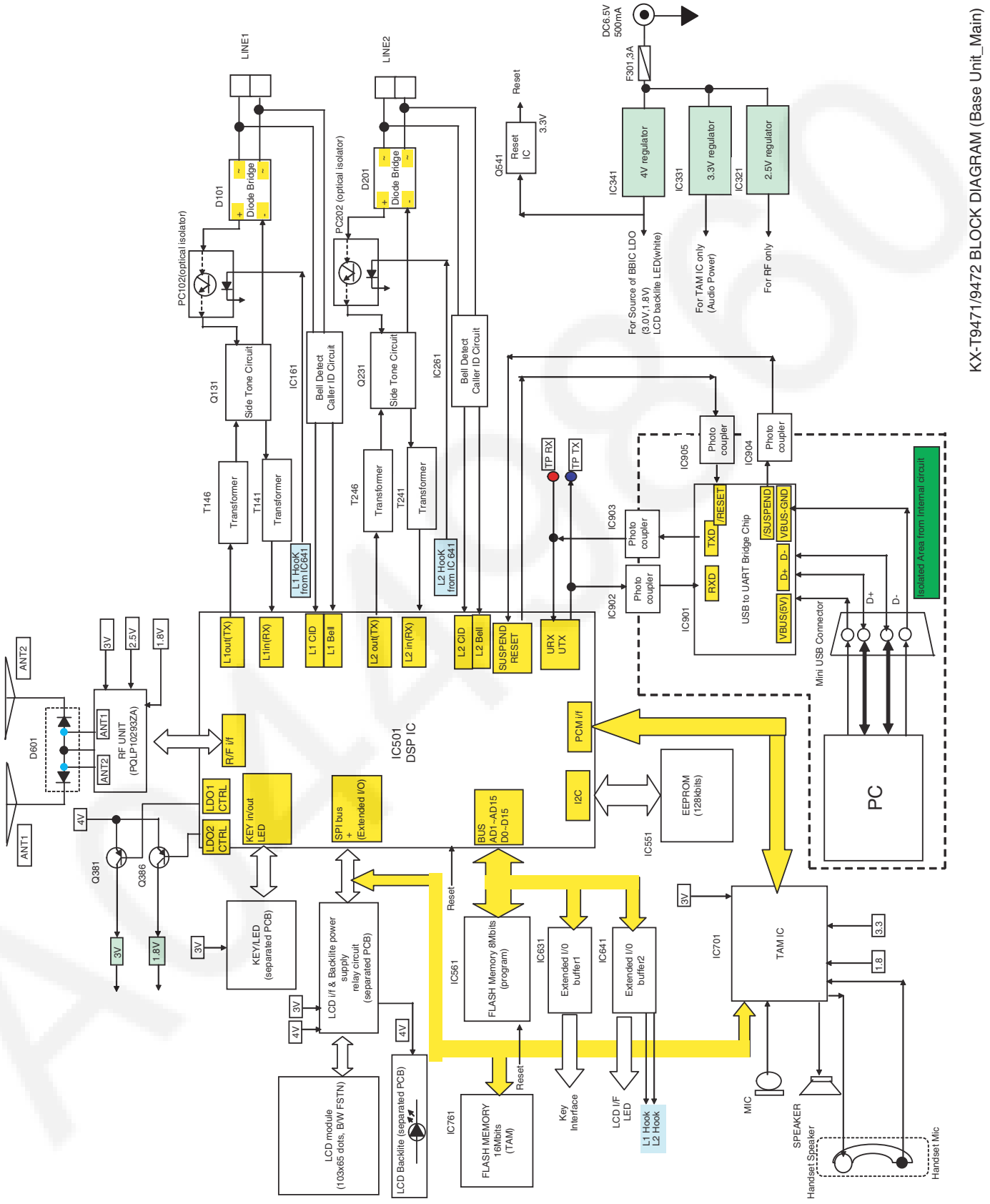
	Base Unit	Portable	Charger
Power source	AC Adaptor (PQLV219Y , 120 V AC, 60 Hz)	Rechargeable Ni-MH battery AAA (R03) size (1.2 V 630 mAh)	AC Adaptor (PQLV219Y, 120 V AC, 60 Hz)
Receiving Method	Super Heterodyne	Super Heterodyne	——
Oscillation Method	PLL synthesizer	PLL synthesizer	——
Detecting Method	Quadrature Discriminator	Quadrature Discriminator	——
Tolerance of OSC Frequency	10.368 MHz ±100 Hz	10.368 MHz ±100 Hz	——
Modulation Method	Frequency Modulation	Frequency Modulation	——
ID Code	40 bit	40 bit	——
Ringer Equivalence No. (REN)	0.1B	——	——
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. 1.2 W Maximum: Approx. 2.7 W	11 days at Standby, 5 hours at Talk	Standby: Approx. 0.6 W, Maximum: Approx. 3.6 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. 185mm x 223 mm x 128 mm	Approx. 156 mm x 49 mm x 32 mm	Approx. 51 mm x 75 mm x 88 mm
Mass (Weight)	Approx. 690 g	Approx. 130 g	Approx. 60 g

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

Note for service:
- Operation range: Up to 300 m outdoors, Up to 50 m indoors, depending on the condition.
- Analog telephone connection: Telephone Line
- Optional headset: KX-TCA60, KX-TCA93, KX-TCA94, KX-TCA400, KX-TCA430

4 Technical Descriptions

4.1. Block Diagram (Base Unit)



4.2. Circuit Operation (Base Unit)

4.2.1. Outline

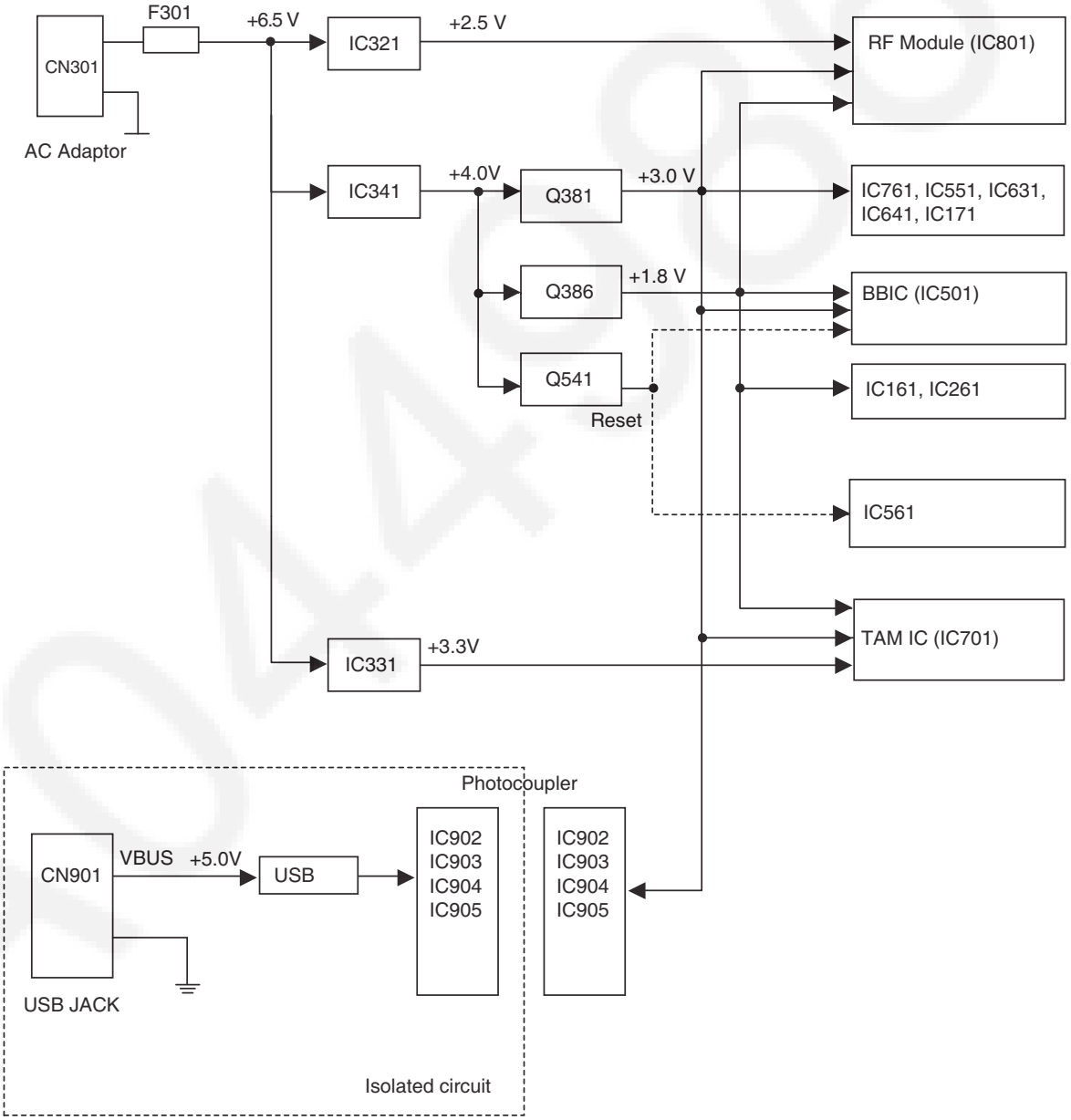
Base unit consists of the following ICs as shown in **Block Diagram (Base Unit)** (P.7).

- DECT BBIC (**B**ase **B**and IC): IC501
  - Handling all the audio, signal and data processing needed in a US DECT base unit
  - Controlling the US 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
  - All interfaces (ex: RF module, EEPROM, LED, Analog Front End, etc.)
- RF Module: IC801
  - PLL Oscillator
  - Detector
  - Compress/Expander
  - First Mixer
  - Amplifier for transmission and reception
- EEPROM: IC551
  - Temporary operating parameters (for RF, etc.)
- FLASH MEMORY 1: IC761
  - Voice Prompt (TAM) D/L Area
  - ICM/OGM/MEMO Recording Area
- TAM Companion: IC701
  - Voice data compression and decompression
  - Speaker Amp
  - Handset MIC Amp
  - Handset Receiver Amp
- Additionally,
  - Power Supply Circuit (+4.0 V, +3.3 V, 3.0V, +2.5 V, +1.8 V output)
  - Crystal Circuit (10.368 MHz)
  - Telephone Line Interface Circuit
- FLASH MEMORY 2: IC561
  - Program DL
- LED Driver: IC641, IC701
- LCD Driver: IC641, IC601
- Key Matrix: IC631, IC501
- USB
  - USB to UART Bridge Controller: IC901
  - Photocoupler: IC902, IC903, IC904, IC905

4.2.2. Power Supply Circuit

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

- DECT BBIC (IC501):
  CN301 (+6.5 V) → F301 → IC341 → IC326 → Q386 → IC501
  CN301 (+6.5 V) → F301 → IC341→ IC326 → Q381 → IC501
- RF Module (IC801):
  CN301 (+6.5 V) → F301 → IC321→ IC801 (PLL) (Power AMP)
- EEPROM (IC551)/FLASH MEMORY 1 (IC761)/FLASH MEMORY 2 (IC561)/Latch (IC631/641)/OP Amp (IC171):
  CN301 (+6.5 V) → F301 → IC341 → Q381 → IC761, IC561, IC171, IC631, IC641, IC551
- TAM Companion (IC701):
  CN301 (+6.5 V) → F301 → IC331 → IC701
  CN301 (+6.5 V) → F301 → IC341 → Q386 → IC701
  CN301 (+6.5 V) → F301 → IC341 → Q381 → IC701
- OP Amp (IC161, IC261):
  CN301 (+6.5 V) → F301 → Q386 → IC161/IC261



<Fig.101>

4.2.3. Telephone Line Interface

Note:

[ ]: Line 2

<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, Q101 [Q201] is open to cut the DC loop current and decrease the ring load.

When ring voltage appears at the L1T (A) [L2T (C)] and L1R (B) [L2R (D)] leads (when the telephone rings), the AC ring voltage is transferred as follows;

A [C] - C153 [C253] - R153 [R253] - IC161 (6) [IC261 (6)] ┐
B [D] - C158 [C258] - R156 [R256] - IC161 (5) [IC261 (5)] ┘ IC161 (7) [IC261 (7)] -

Bell R171 [R271] - R172 [R272] - IC171 (2) [IC171 (6)] - IC171 (1) [IC171 (7)] - IC501 (11) [IC501 (12)]
Clip R167 [R268] - IC501 (101) [IC501 (114)]

ON/OFF hook circuit:

In the standby mode, Q101 [Q201] 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 portable, Q103 [Q203] turns on and then Q101, PC102, [Q201, PC202] turns on, thus providing an **off-hook condition** (DC current flows through the circuit) and the following signal flow makes the loop current.

A [C] → D101 [D201] → Q101 [Q201] → Q131 [Q231] → R124 [R224] → R125 [R225] → D101 [D201] → B [D]

4.2.4. Transmitter/Receiver

- Audio Circuits and DTMF tone signal circuits.

Base unit and portable mainly consist of RF Module and DECT BBIC.

Base unit and portable transmit/receive voice signal and data signal through the antenna on carrier frequency.

Signal Path:

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

4.2.4.1. Transmitter Block

The voice signal input from the TEL LINE interface goes to RF Module (IC801) through DECT BBIC (IC501) as shown in **Block Diagram (Base Unit)** (P.7)

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

4.2.4.2. Receiver Block

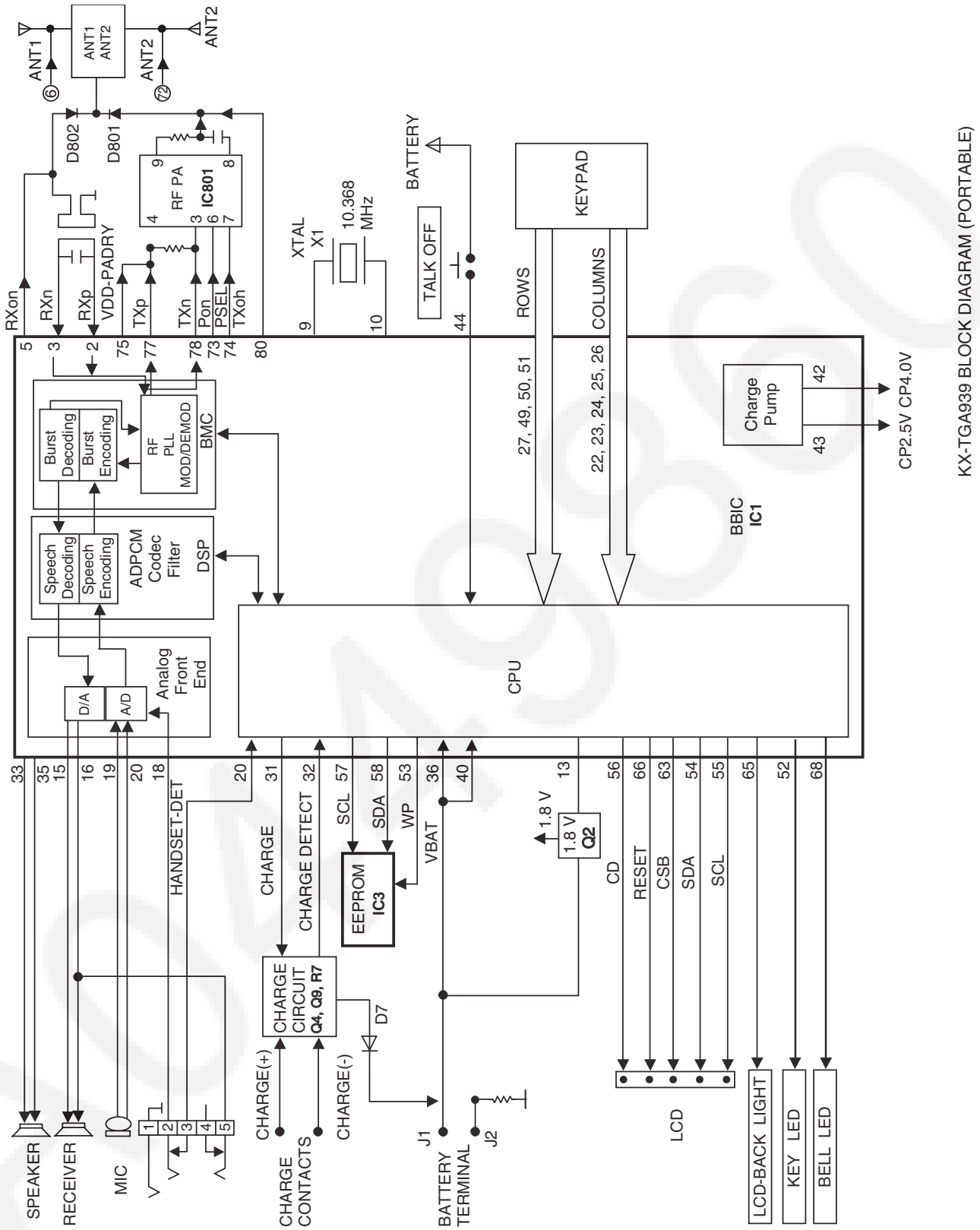
The signal of 1900 MHz band (1920 MHz ~ 1930 MHz) which is input from antenna is input to IC801 as shown in **Block Diagram (Base Unit)** (P.7).

In IC801, the signal of 1900 MHz band is downconverted to 864 kHz signal and demodulated, and goes to IC501 as GAP (**G**eneric **A**ccess **P**rofile) standard DECT frames. It passes through the decoding section burst switch controller where it separates out the frame information and performs de-encryption and de-scrambling as required. It then goes to the DSP section where it is turned back into analog audio. This is amplified by the analog front end, and goes to the TEL LINE Interface.

4.2.5. USB Interface

IC901 includes a USB2.0 full-speed function controller, USB transceiver, oscillator, one-time programmable ROM, and asynchronousserial data bus (UART) with full modem control signals. USB and UART is bridged by IC901.

4.3. Block Diagram (Portable)



4.4. Circuit Operation (Portable)

4.4.1. Outline

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

- 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
- RF Power Amp: IC801
  - Amplifier for transmission
- EEPROM: IC3
  - Temporary operating parameters (for RF, etc.)

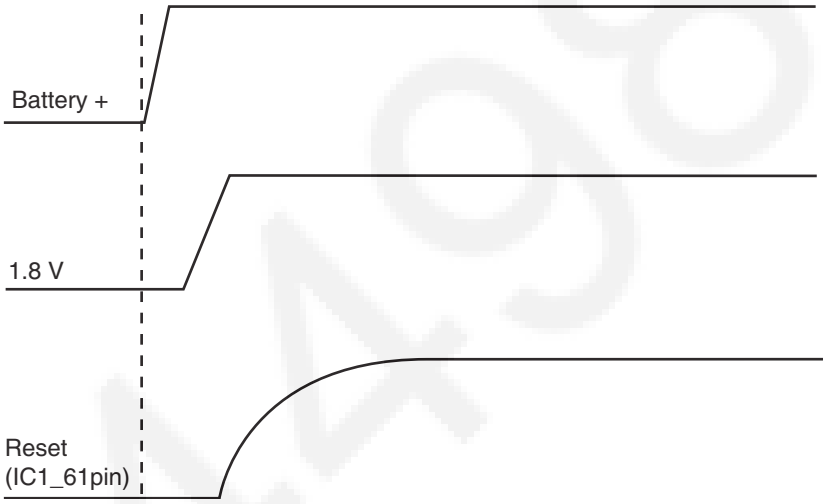
4.4.2. Power Supply Circuit/Reset Circuit

Circuit Operation:

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

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

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



4.4.3. Charge Circuit

Circuit Operation:

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

DC+(6.5 V) → R57 → D22 → R56 → R55 → CHARGE+(Base) → CHARGE+(Portable) → L4 → Q4 → D7→ F1 → BATTERY+... Battery...

BATTERY- → L8 → R45 → GND → L5 → CHARGE-(Portable)→ CHARGE-(Base) → GND → DC-(GND)

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

The charge current is controlled by switching Q9 of Portable.

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

4.4.4. Battery Low/Power Down Detector

Circuit Operation:

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

The detected voltage is as follows;

- Battery Low

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

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

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

  The BBIC detects this level and power down.

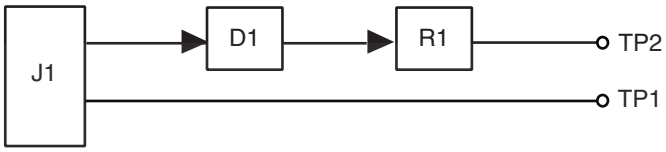
4.4.5. Speakerphone

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

4.5. Circuit Operation (Charger Unit)

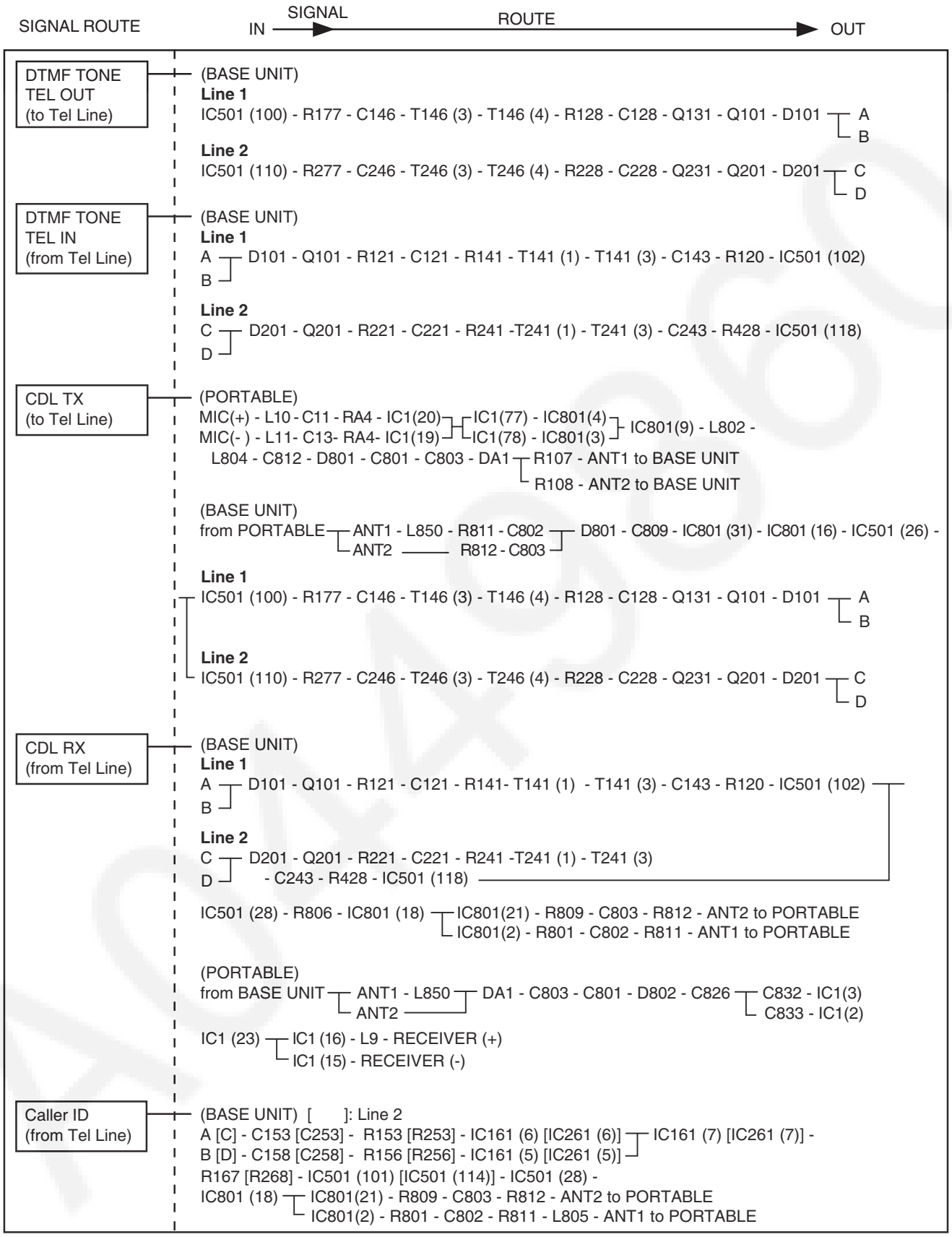
4.5.1. Power Supply Circuit

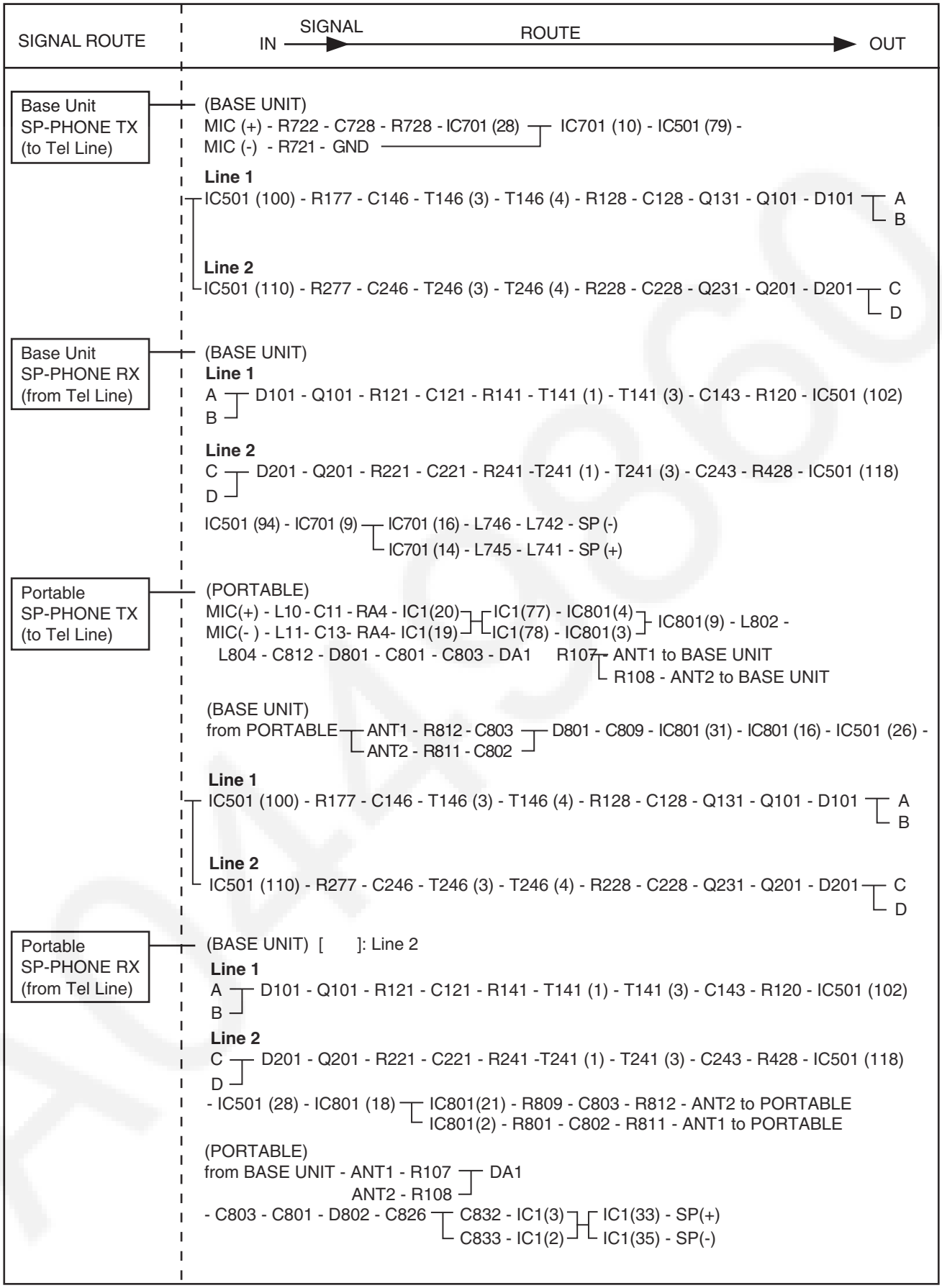
The power supply is as shown.

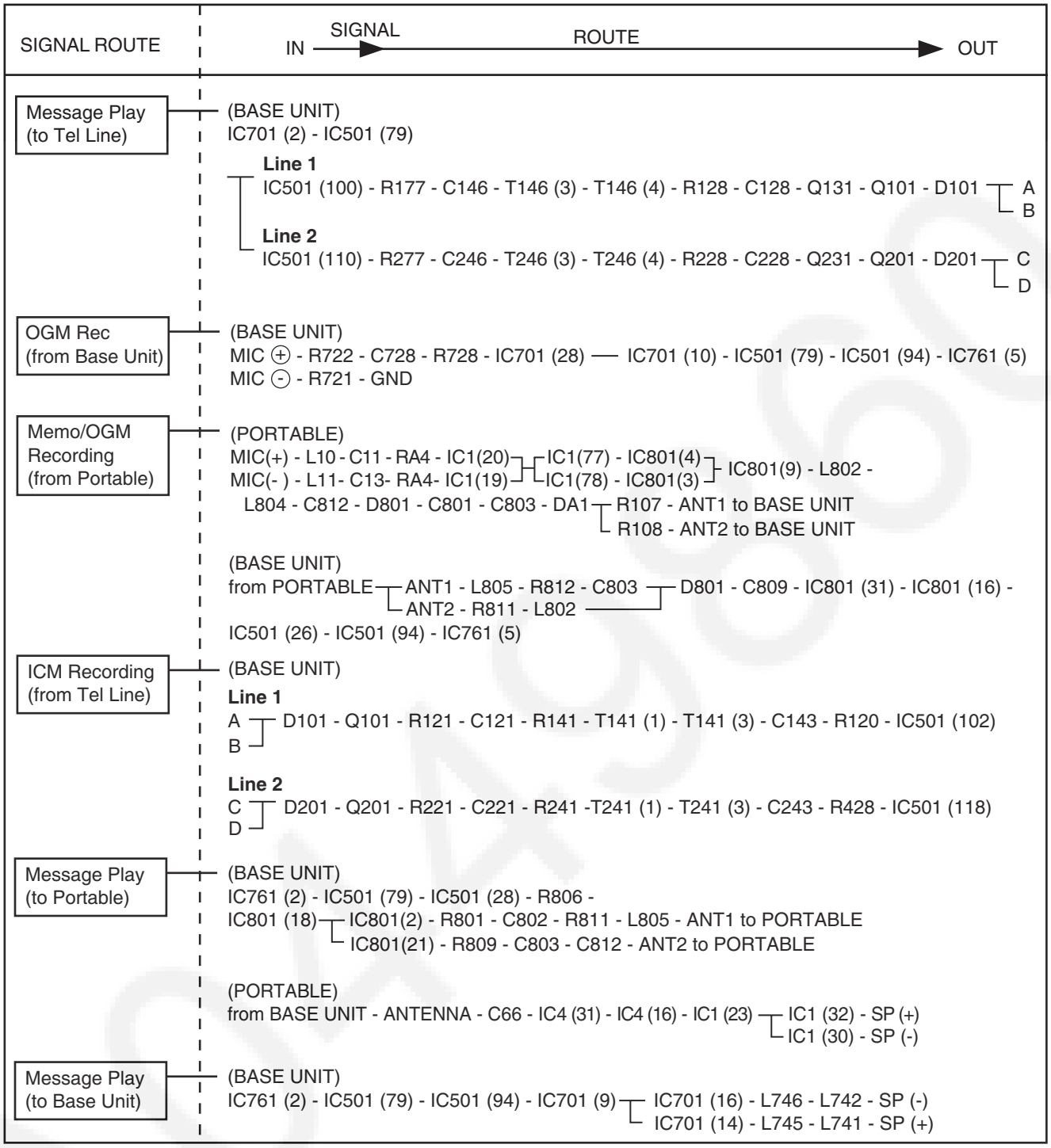


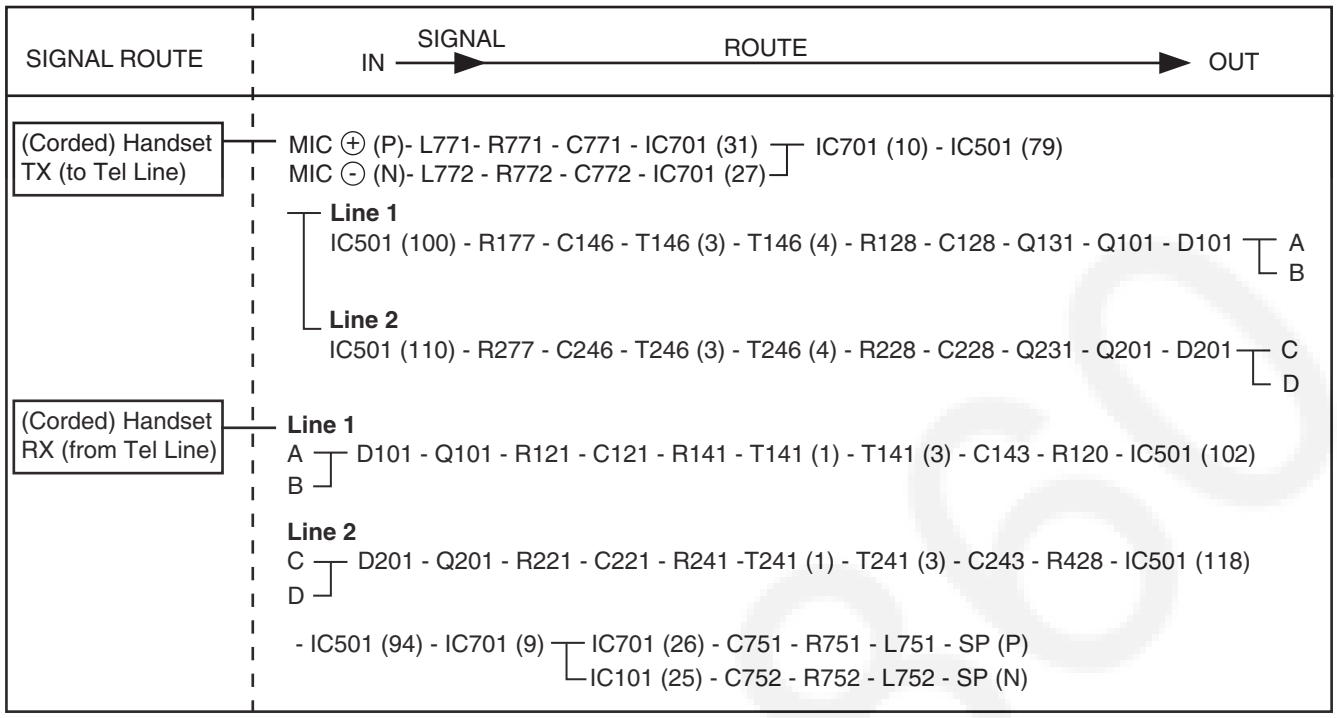
AC Adaptor

4.6. Signal Route

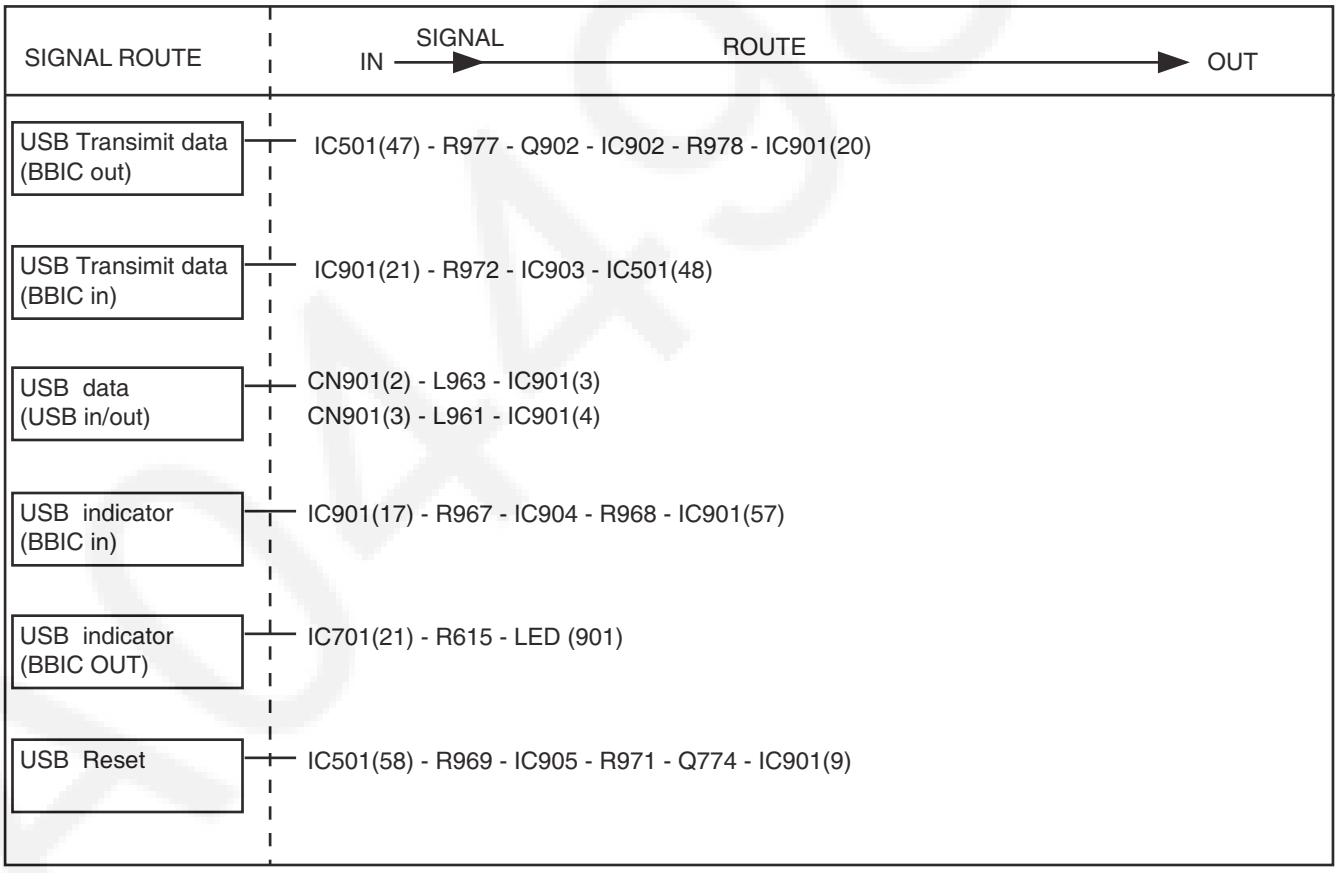



SIGNAL ROUTE
IN
SIGNAL
ROUTE
OUT
Base Unit SP-PHONE TX (to Tel Line)
(BASE UNIT)
MIC (+) - R722 - C728 - R728 - IC701 (28)
MIC (-) - R721 - GND
IC701 (10) - IC501 (79) -
Line 1
IC501 (100) - R177 - C146 - T146 (3) - T146 (4) - R128 - C128 - Q131 - Q101 - D101
A
B
Line 2
IC501 (110) - R277 - C246 - T246 (3) - T246 (4) - R228 - C228 - Q231 - Q201 - D201
C
D
Base Unit SP-PHONE RX (from Tel Line)
(BASE UNIT)
Line 1
A
B
D101 - Q101 - R121 - C121 - R141 - T141 (1) - T141 (3) - C143 - R120 - IC501 (102)
Line 2
C
D
D201 - Q201 - R221 - C221 - R241 -T241 (1) - T241 (3) - C243 - R428 - IC501 (118)
IC501 (94) - IC701 (9)
IC701 (16) - L746 - L742 - SP (-)
IC701 (14) - L745 - L741 - SP (+)
Portable SP-PHONE TX (to Tel Line)
(PORTABLE)
MIC(+) - L10 - C11 - RA4 - IC1(20)
MIC(-) - L11- C13- RA4- IC1(19)
IC1(77) - IC801(4)
IC1(78) - IC801(3)
IC801(9) - L802 -
L804 - C812 - D801 - C801 - C803 - DA1
R107 - ANT1 to BASE UNIT
R108 - ANT2 to BASE UNIT
(BASE UNIT)
from PORTABLE
ANT1 - R812 - C803
ANT2 - R811 - C802
D801 - C809 - IC801 (31) - IC801 (16) - IC501 (26) -
Line 1
IC501 (100) - R177 - C146 - T146 (3) - T146 (4) - R128 - C128 - Q131 - Q101 - D101
A
B
Line 2
IC501 (110) - R277 - C246 - T246 (3) - T246 (4) - R228 - C228 - Q231 - Q201 - D201
C
D
Portable SP-PHONE RX (from Tel Line)
(BASE UNIT) [ ]: Line 2
Line 1
A
B
D101 - Q101 - R121 - C121 - R141 - T141 (1) - T141 (3) - C143 - R120 - IC501 (102)
Line 2
C
D
D201 - Q201 - R221 - C221 - R241 -T241 (1) - T241 (3) - C243 - R428 - IC501 (118)
- IC501 (28) - IC801 (18)
IC801(21) - R809 - C803 - R812 - ANT2 to PORTABLE
IC801(2) - R801 - C802 - R811 - ANT1 to PORTABLE
(PORTABLE)
from BASE UNIT - ANT1 - R107
ANT2 - R108
DA1
- C803 - C801 - D802 - C826
C832 - IC1(3)
C833 - IC1(2)
IC1(33) - SP(+)
IC1(35) - SP(-)


SIGNAL ROUTE
IN
SIGNAL
ROUTE
OUT
Message Play (to Tel Line)
(BASE UNIT)
IC701 (2) - IC501 (79)
Line 1
IC501 (100) - R177 - C146 - T146 (3) - T146 (4) - R128 - C128 - Q131 - Q101 - D101 - A / B
Line 2
IC501 (110) - R277 - C246 - T246 (3) - T246 (4) - R228 - C228 - Q231 - Q201 - D201 - C / D
OGM Rec (from Base Unit)
(BASE UNIT)
MIC ⊕ - R722 - C728 - R728 - IC701 (28) — IC701 (10) - IC501 (79) - IC501 (94) - IC761 (5)
MIC ⊖ - R721 - GND
Memo/OGM Recording (from Portable)
(PORTABLE)
MIC(+) - L10 - C11 - RA4 - IC1(20) - IC1(77) - IC801(4)
MIC(-) - L11- C13- RA4- IC1(19) - IC1(78) - IC801(3)
IC801(9) - L802 - L804 - C812 - D801 - C801 - C803 - DA1 - R107 - ANT1 to BASE UNIT / R108 - ANT2 to BASE UNIT
(BASE UNIT)
from PORTABLE - ANT1 - L805 - R812 - C803 - D801 - C809 - IC801 (31) - IC801 (16) -
ANT2 - R811 - L802
IC501 (26) - IC501 (94) - IC761 (5)
ICM Recording (from Tel Line)
(BASE UNIT)
Line 1
A / B - D101 - Q101 - R121 - C121 - R141 - T141 (1) - T141 (3) - C143 - R120 - IC501 (102)
Line 2
C / D - D201 - Q201 - R221 - C221 - R241 -T241 (1) - T241 (3) - C243 - R428 - IC501 (118)
Message Play (to Portable)
(BASE UNIT)
IC761 (2) - IC501 (79) - IC501 (28) - R806 -
IC801 (18) - IC801(2) - R801 - C802 - R811 - L805 - ANT1 to PORTABLE
IC801(21) - R809 - C803 - C812 - ANT2 to PORTABLE
(PORTABLE)
from BASE UNIT - ANTENNA - C66 - IC4 (31) - IC4 (16) - IC1 (23) - IC1 (32) - SP (+)
IC1 (30) - SP (-)
Message Play (to Base Unit)
(BASE UNIT)
IC761 (2) - IC501 (79) - IC501 (94) - IC701 (9) - IC701 (16) - L746 - L742 - SP (-)
IC701 (14) - L745 - L741 - SP (+)


SIGNAL ROUTE
IN
SIGNAL
ROUTE
OUT
(Corded) Handset TX (to Tel Line)
MIC ⊕ (P)- L771- R771 - C771 - IC701 (31)
MIC ⊖ (N)- L772 - R772 - C772 - IC701 (27)
IC701 (10) - IC501 (79)
Line 1
IC501 (100) - R177 - C146 - T146 (3) - T146 (4) - R128 - C128 - Q131 - Q101 - D101
A
B
Line 2
IC501 (110) - R277 - C246 - T246 (3) - T246 (4) - R228 - C228 - Q231 - Q201 - D201
C
D
(Corded) Handset RX (from Tel Line)
Line 1
A
B
D101 - Q101 - R121 - C121 - R141 - T141 (1) - T141 (3) - C143 - R120 - IC501 (102)
Line 2
C
D
D201 - Q201 - R221 - C221 - R241 -T241 (1) - T241 (3) - C243 - R428 - IC501 (118)
- IC501 (94) - IC701 (9)
IC701 (26) - C751 - R751 - L751 - SP (P)
IC101 (25) - C752 - R752 - L752 - SP (N)

USB


SIGNAL ROUTE
IN
SIGNAL
ROUTE
OUT
USB Transimit data (BBIC out)
IC501(47) - R977 - Q902 - IC902 - R978 - IC901(20)
USB Transimit data (BBIC in)
IC901(21) - R972 - IC903 - IC501(48)
USB data (USB in/out)
CN901(2) - L963 - IC901(3)
CN901(3) - L961 - IC901(4)
USB indicator (BBIC in)
IC901(17) - R967 - IC904 - R968 - IC901(57)
USB indicator (BBIC OUT)
IC701(21) - R615 - LED (901)
USB Reset
IC501(58) - R969 - IC905 - R971 - Q774 - IC901(9)

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. Registering a Portable to the Base Unit

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

1 **Portable:**
【MENU】 [#] [1] [3] [0]

2 **Base unit:**
Press and hold **【LOCATOR】** for about 5 seconds until the registration tone sounds.
- If all registered portables start ringing, press **【LOCATOR】** again to stop, then repeat this step.
- The next step must be completed within 90 seconds.

3 **Portable:**
Press **【OK】**, then wait until a long beepsounds.

Note:

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

7.1.1. Deregistering a Portable

A portable can cancel its own registration to the base unit, or other portables registered to the same base unit. This allows the portable to end its wireless connection with the system.

1 **【MENU】** [#] [1] [3] [1]

2 [3] [3] [5] →**【OK】**
- All portables registered to the base unit are displayed.

3 Select the portable you want to cancel by pressing the desired portable(s) number.
- The selected portable number(s) flashes.
- To cancel a selected portable number, press the number again. The number willstop flashing.

4 **【OK】**→ **【▲▼】**: **"Yes"** → **【SELECT】**
- When you cancel a different portable than the one you are now using, press **【OFF】** to exit.

7.2. Copying Phonebook Entries

You can copy phonebook entries from the base unit to a portable or vice versa.

Important:

- Group ringer tones are not copied.
- You cannot copy the phonebook entries between portables.

7.2.1. Copying All Entries

Base unit

1 【📖】→【MENU】
2 【▲▼】: "Copy all" → 【SELECT】
3 Enter the portable number to copy to.
   ● When all entries have been copied, "Completed" is displayed.
4 【■】(EXIT)

Portable

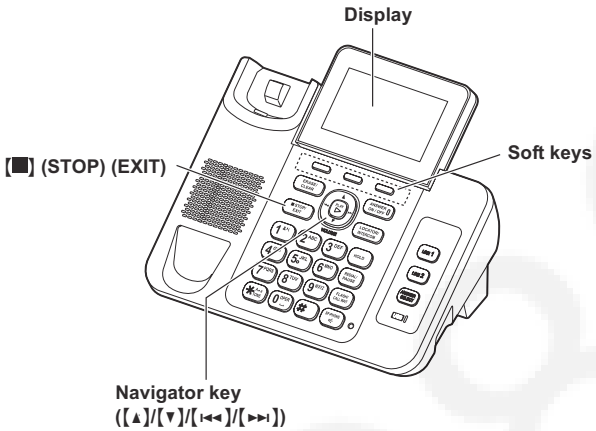
1 【MENU】#280 →【MENU】
2 【▲▼】: "Copy all to base" → 【SELECT】
   ● When all entries have been copied,"Completed" is displayed.
3 【OFF】

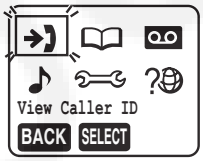
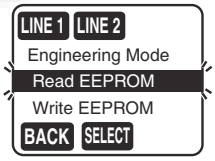
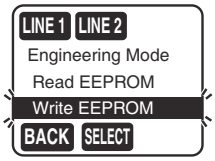
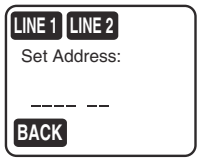
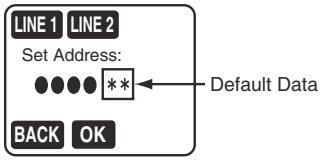
8 Service Mode

8.1. Engineering Mode

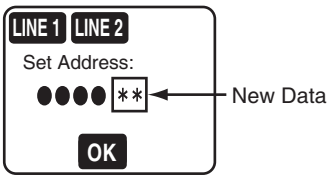
8.1.1. Base Unit

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

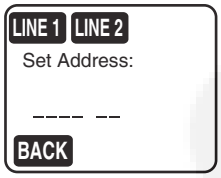


B/U key operation	B/U LCD
1). Press " MENU " (middle soft key).	
2). Enter "7", "2", "6", "2", "7", "6", "6", "4". **Note:** 7262 7664 = PANA SONI (see letters printed on dial keys)	
3). Select "Write EEPROM" by Navigator key.	
4). Press " SELECT " (middle soft key).	
5). Enter "●", "●", "●", "●" (Address). (*2)	

6). Enter "＊", "＊" (New Data). (*2)



7). Press " OK " (middle soft key).
A long confirmation beep will be heard.



8). Press "**[■] (STOP) (EXIT)**" 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(*1)	Default Data	New Data		Remarks
Frequency	00 02	75	-	-	Use these items in a **READ-ONLY** mode to confirm the contents. Careless rewriting may cause serious damage to the computer system.
ID	00 11~00 15	Given value	-	-	

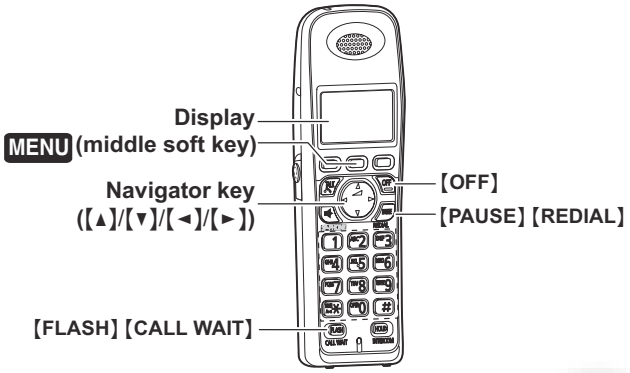
Note:

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

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

8.1.2. Portable

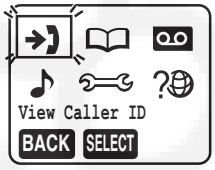
Important:
Make sure the address on LCD is correct when entering new data. Otherwise, you may ruin the unit.



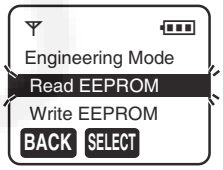
H/S key operation

H/S LCD

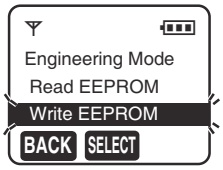
1). Press "MENU" (middle soft key).



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

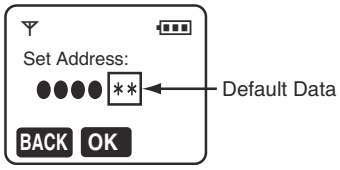


3). Select "Write EEPROM" by Navigator key.

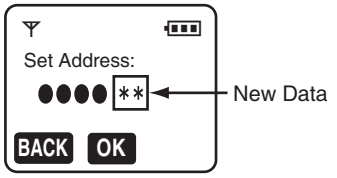


4). Press "SELECT" (middle soft key).

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



6). Enter "＊", "＊" (New Data). (*1)



7). Press " OK " (middle soft key).
A long confirmation beep will be heard.

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

Frequently Used Items (Portable)

ex.)

Items	Address	Default Data	New Data	Possible Adjusted Value MAX (hex)	Possible Adjusted Value MIN (hex)	Remarks
Battery Low	00 04	70	-	-	-	(*2)
Frequency	00 01~00 02	F6 02	-	-	-	
ID	00 10~00 14	Given value	-	-	-	

Note:

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

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

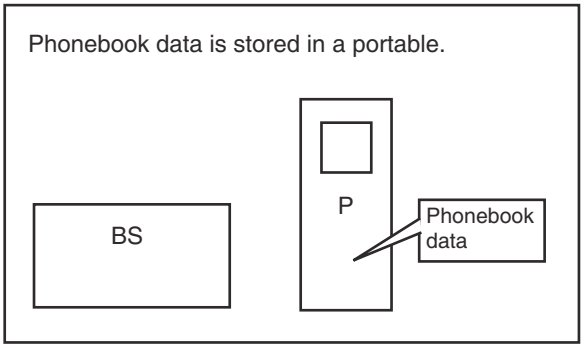
(*2) Use these items in a READ-ONLY mode to confirm the contents. Careless rewriting may cause serious damage to the portable.

8.2. Copying Phonebook Items when Repairing

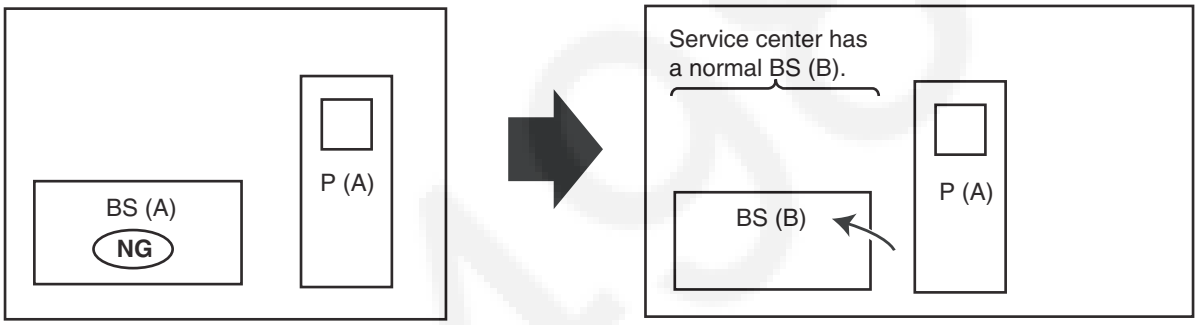
You can copy the base unit (Maximum number of contacts is 100.) phonebook to another (compatible Panasonic) portable. This will help to save the original phonebook data which the customer has registered.

* You cannot copy the base unit phonebook to another base unit.

Refer to the following procedures.

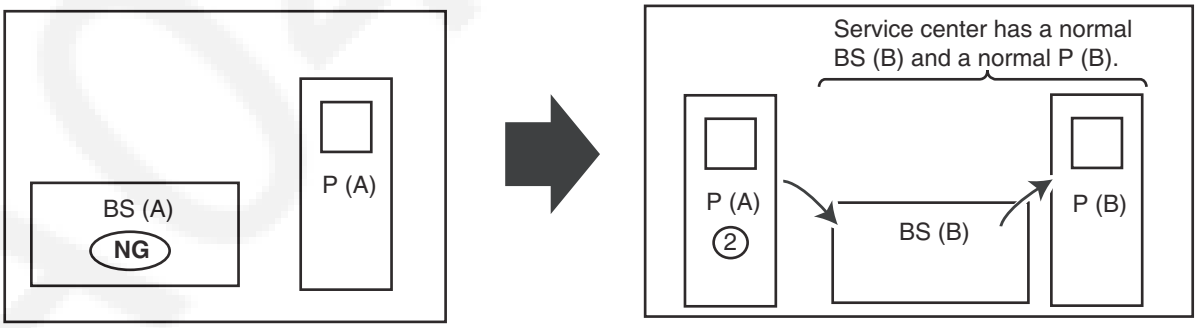


Case 1: A base unit has a defect.
(Replacing a base unit PCB etc...)



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

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

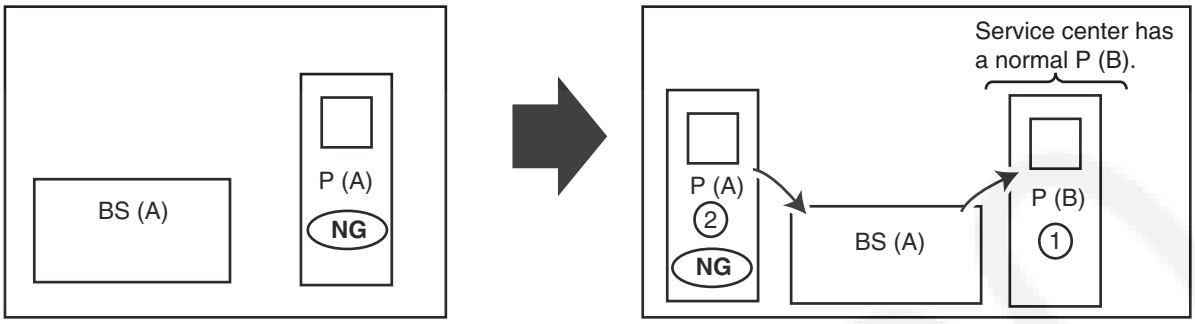


1. Register P (A) to BS (B) as a portable no. 2.
2. Copy the phonebook data from P (A) to BS (B) then copy the phonebook data from BS (B) to P (B).
3. Cancel the P 2 (P (A)).

Note:

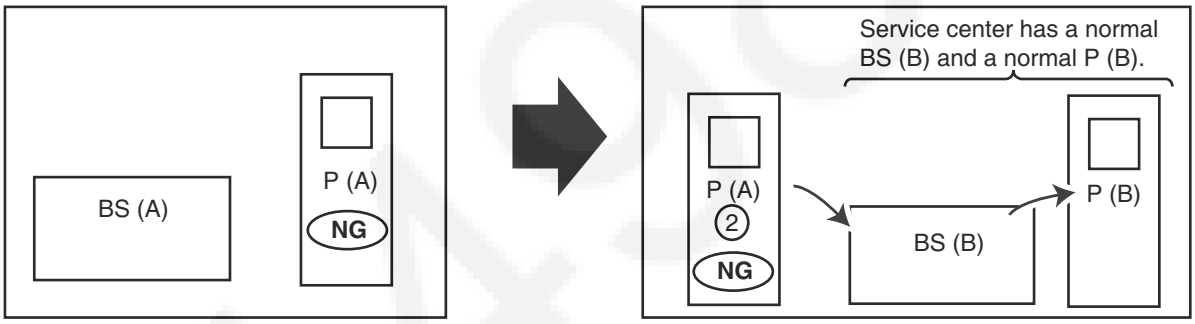
- BS=Base Unit, P=Portable
- If the max number of portables are already registered to the base unit, a new portable cannot be registered.
- To register the portable, refer to **Registering a Portable to the Base Unit** (P.18)
- To cancel the portable, refer to **Deregistering a Portable** (P.18)
- To copy the portable phonebook, refer to **Copying Phonebook Entries** (P.19)

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



1. Cancel P (A).
2. Register P (B) as a portable no. 1.
3. Register P (A) as a portable no. 2.
4. Copy the phonebook data from P (A) to BS (A) then copy the phonebook data from BS (A) to P (B).
5. Cancel P 2 (P (A)).

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



1. Register P (A) as a portable no. 2.
2. Copy the phonebook data from P (A) to BS (B) then copy the phonebook data from BS (B) to P (B).
3. Cancel P 2 (P (A)).

Note:

- BS=Base Unit, P=Portable
- If the max number of portables are already registered to the base unit, a new portable cannot be registered.
- To register the portable, refer to **Registering a Portable to the Base Unit** (P.18)
- To cancel the portable, refer to **Deregistering a Portable** (P.18)
- To copy the portable phonebook, refer to **Copying Phonebook Entries** (P.19)

8.3. How to Clear User Setting

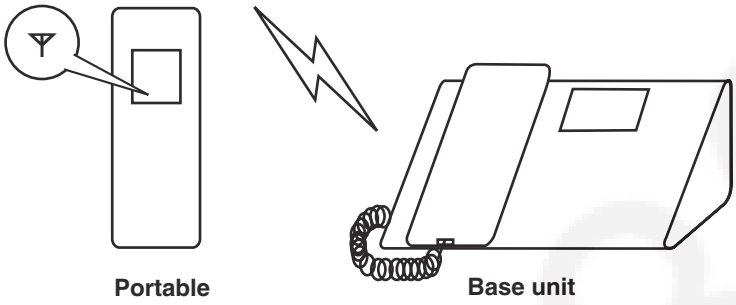
Units are reset to the Factory settings by this operation (Erase recorded voice messages, stored Phone numbers, Caller list and etc.)

Note:

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

8.3.1. Resetting both base unit and portable

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



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

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

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

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

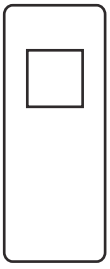
⑤ Disconnect the AC adaptor, then remove the battery.

Note:

(*1) Refer to **Registering a Portable to the Base Unit** (P.18).

8.3.2. Resetting only portable

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



① Install the charged batteries into the Portable.

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

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

④ Remove the battery.

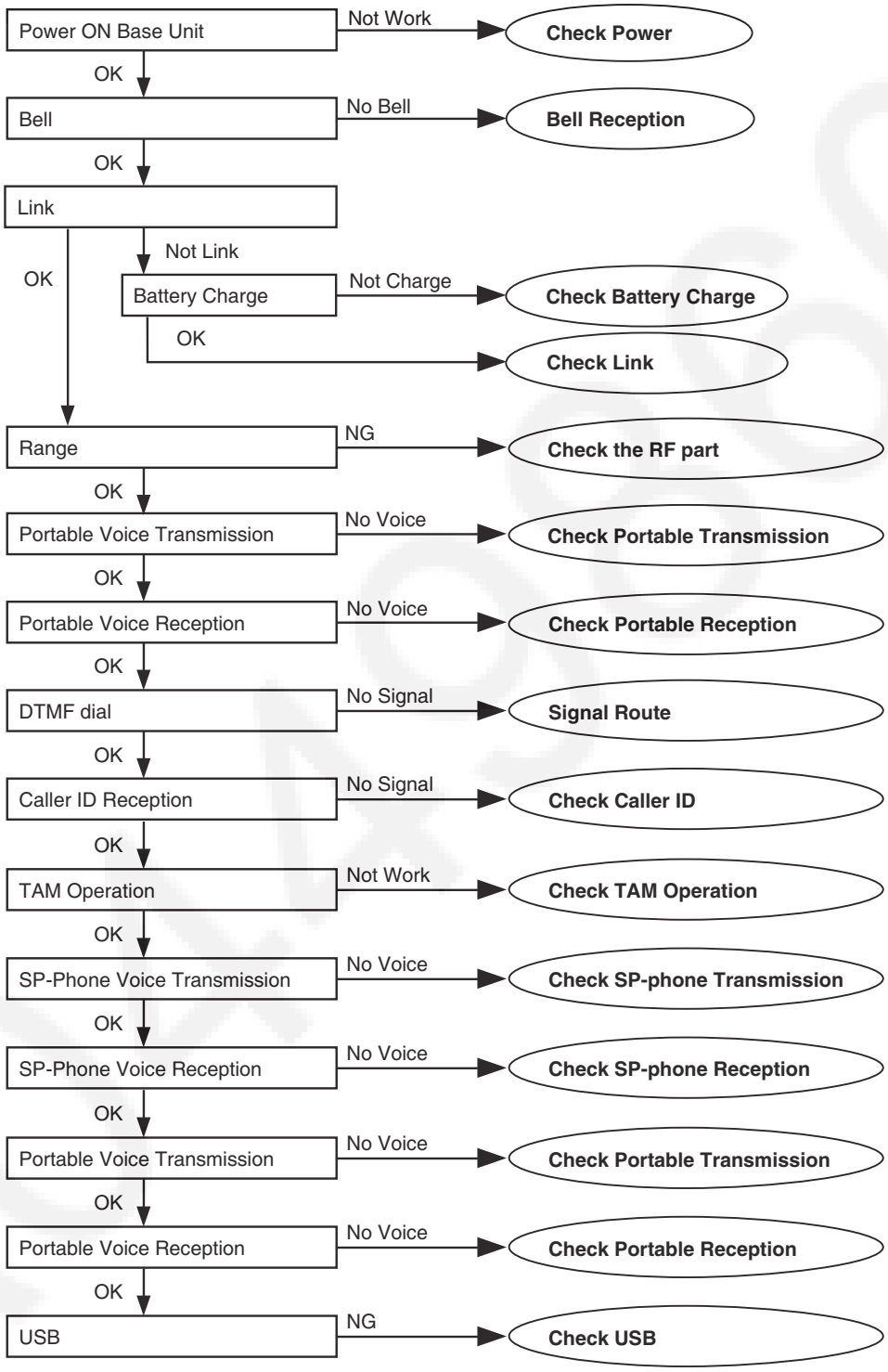
Note: (*2)

- The portable registration to the base unit is cancelled.
- If the portable needs to be registered to the base unit, refer to **Registering a Portable to the Base Unit** (P.18).
- If users do not bring the base unit with them, the registration procedure has to be done by users themselves.

9 Troubleshooting Guide

9.1. Troubleshooting Flowchart

Flow Chart



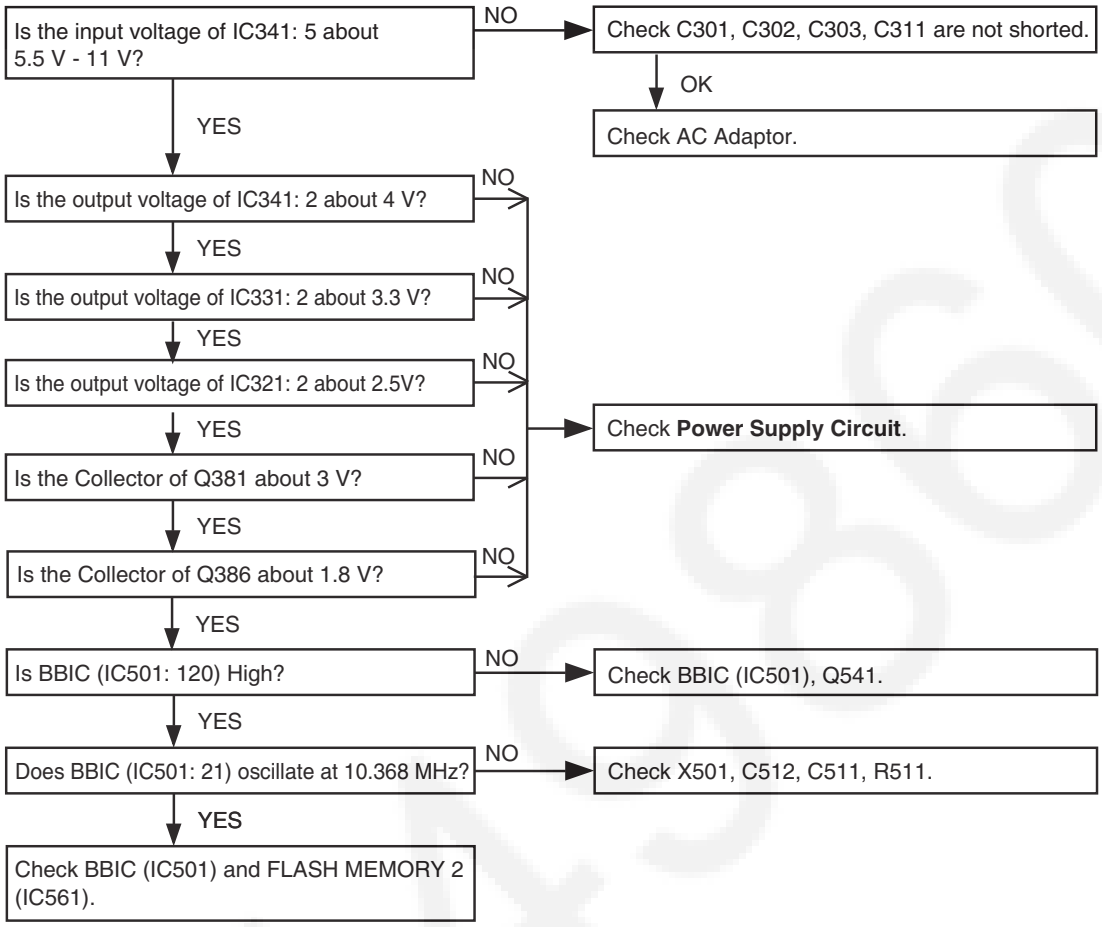
Cross Reference:

Check Power (P.28)
Bell Reception (P.38)
Check Battery Charge (P.29)
Check Link (P.30)
Check the RF part (P.34)
Check Portable Transmission (P.37)
Check Portable Reception (P.37)
Signal Route (P.14)
Check Caller ID (P.37)
Check TAM Operation (P.38)
Check SP-phone Transmission (P.39)
Check SP-phone Reception (P.39)
Check USB Function (P.39)

9.1.1. Check Power

9.1.1.1. Base Unit

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



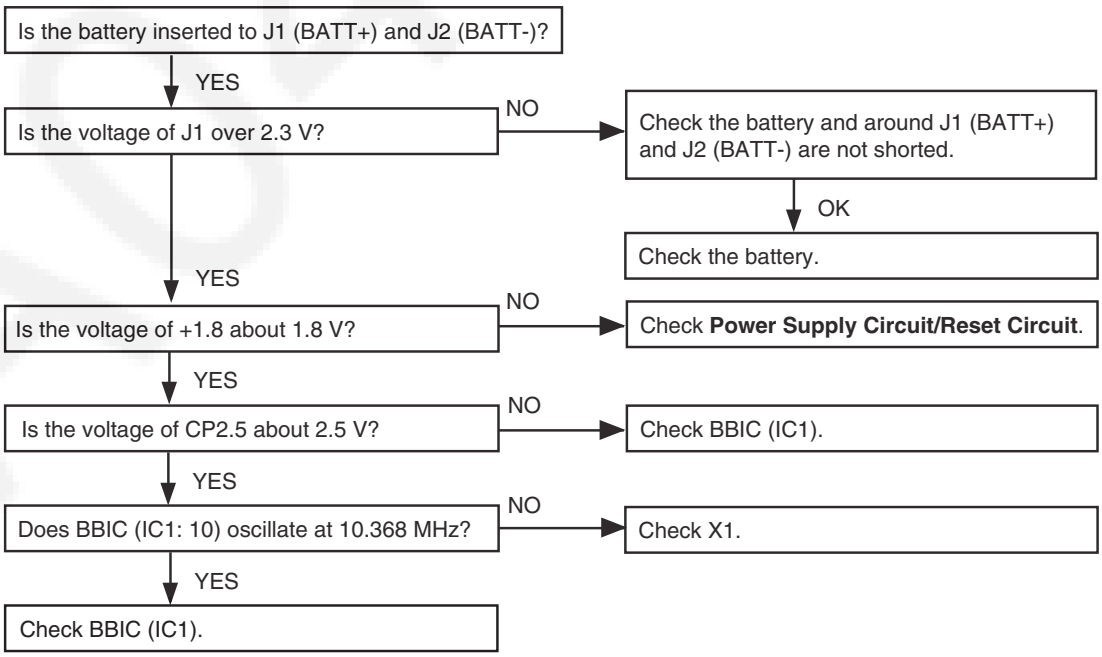
Cross Reference:

Power Supply Circuit (P.9)

Note:

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

9.1.1.2. Portable

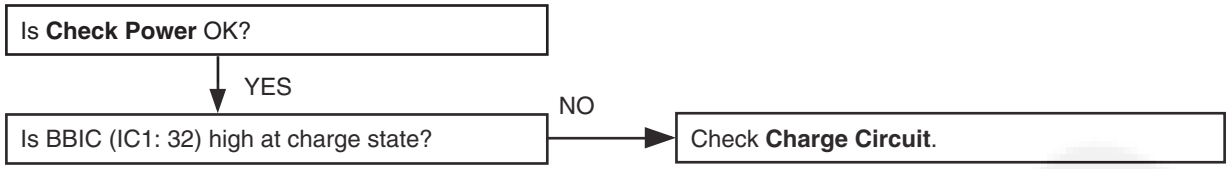


Cross Reference:

Power Supply Circuit/Reset Circuit (P.12)

9.1.2. Check Battery Charge

9.1.2.1. Portable

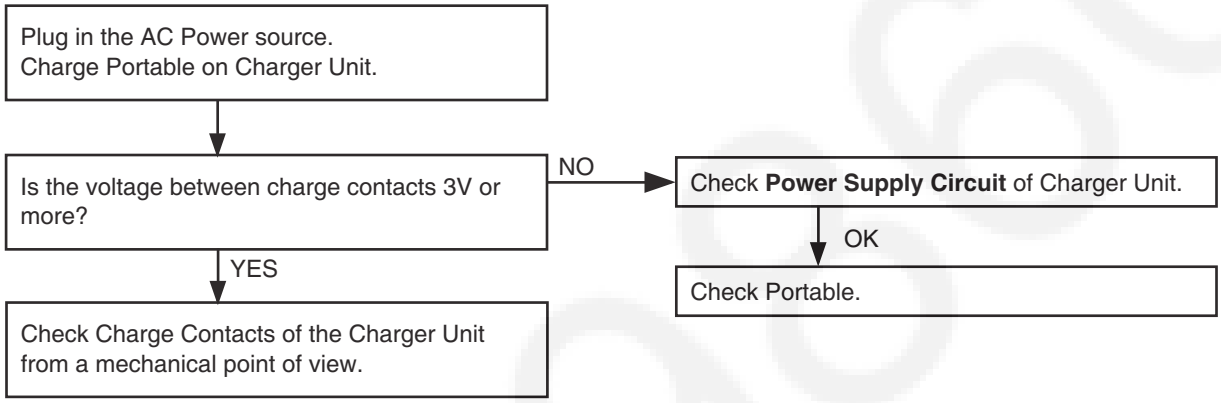


Cross Reference:

Check Power (P.28)

Charge Circuit (P.12)

9.1.2.2. Charger Unit

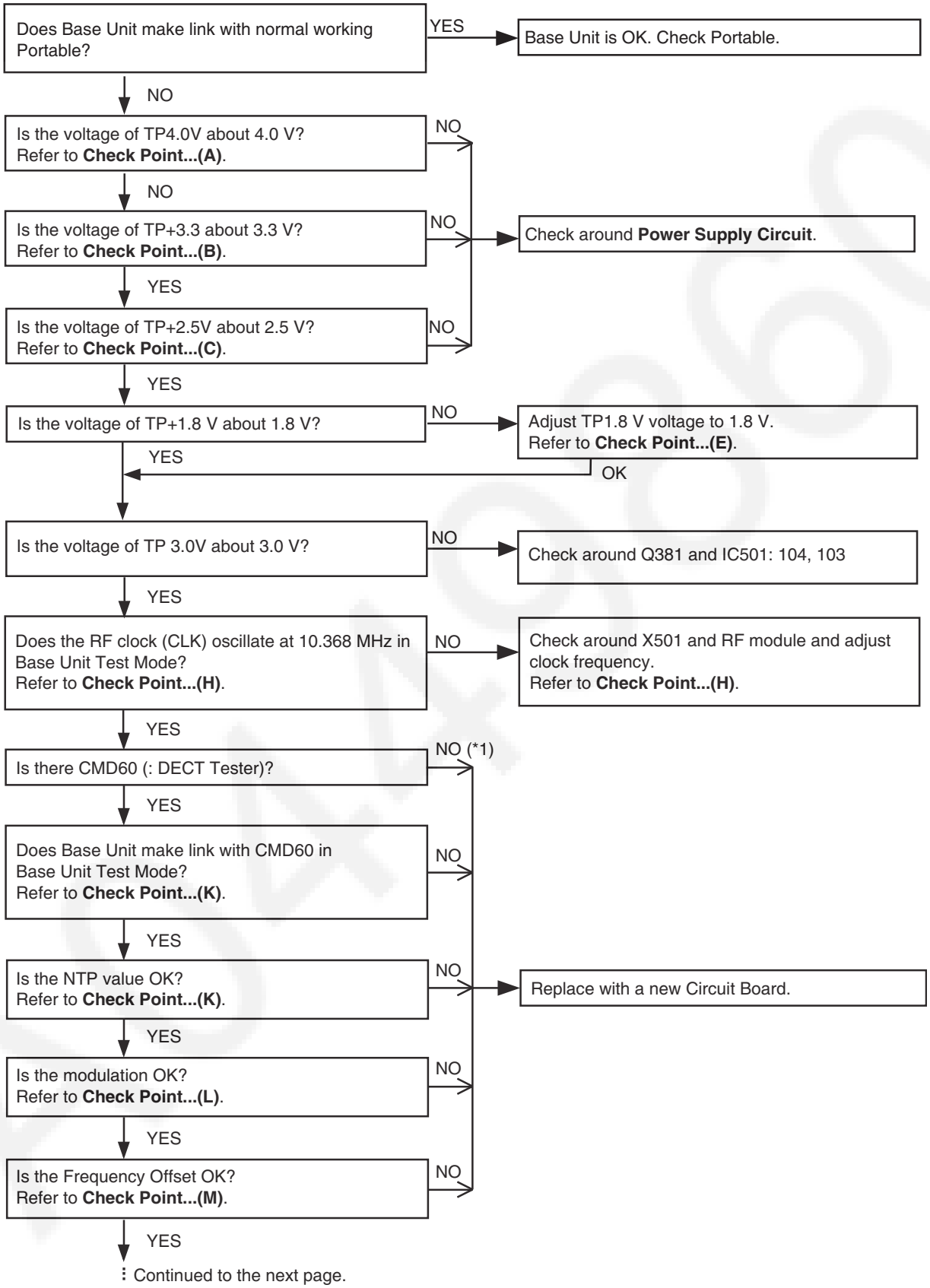


Cross Reference:

Power Supply Circuit (P.9)

9.1.3. Check Link

9.1.3.1. Base Unit



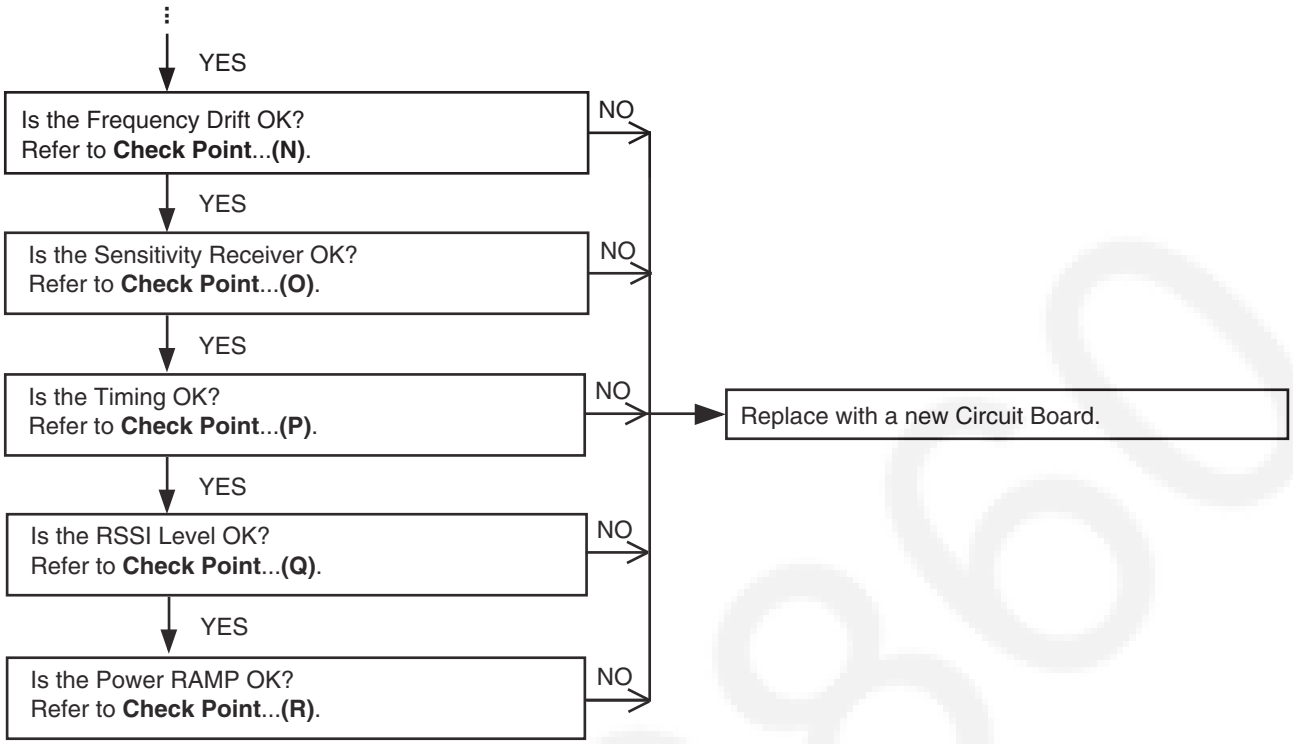
Cross Reference:

Power Supply Circuit (P.9)

Check Point (Base Unit) (P.40)

Note:

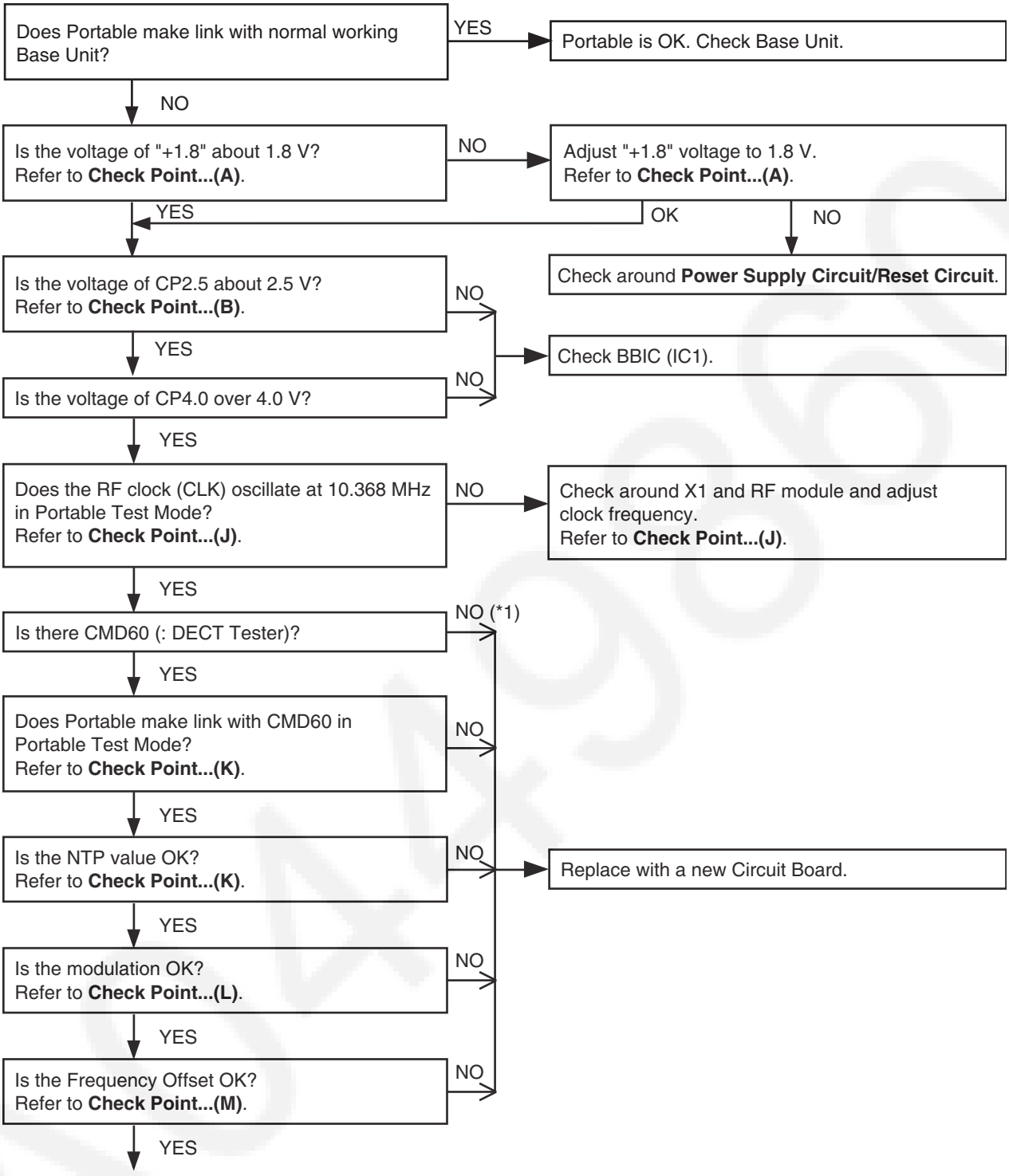
(*1) Refer to **Troubleshooting by Symptom (Base Unit and Charger Unit)** (P.40).



Cross Reference:

Check Point (Base Unit) (P.40)

9.1.3.2. Portable



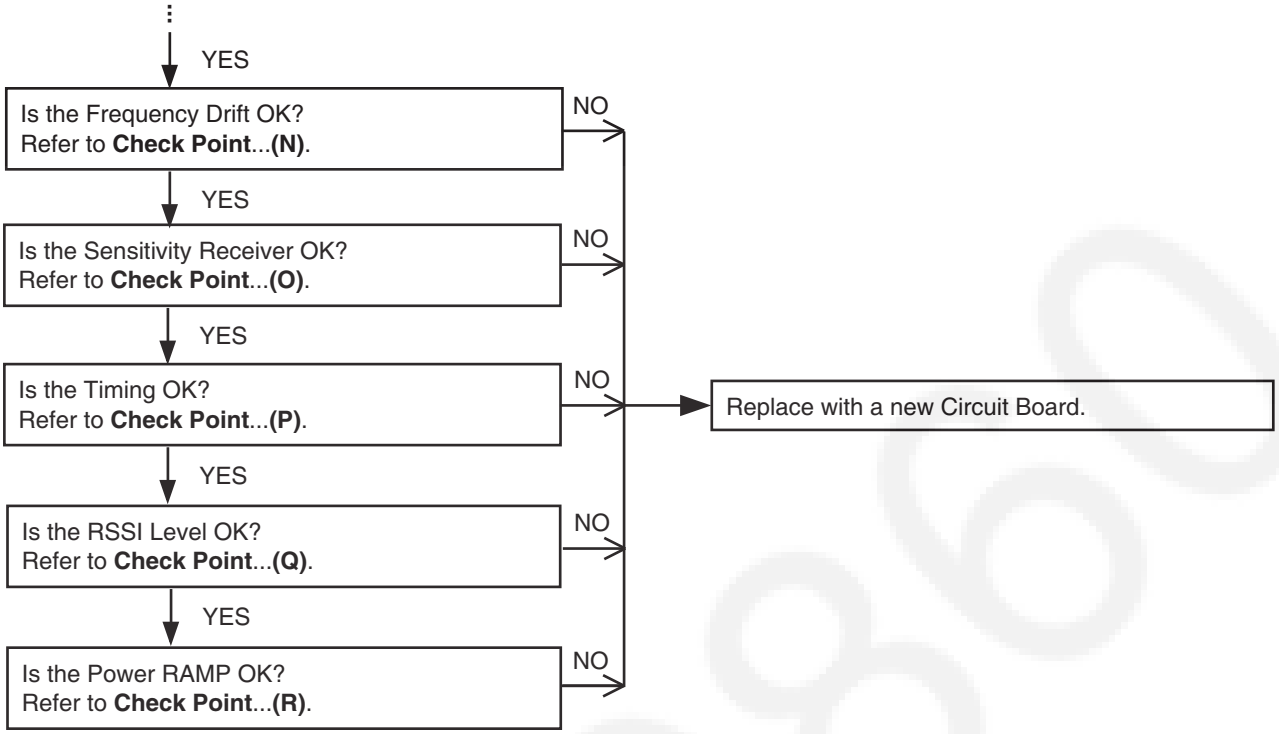
Cross Reference:

Power Supply Circuit/Reset Circuit (P.12)

Check Point (Portable) (P.44)

Note:

(*1) Refer to **Troubleshooting by Symptom (Portable)** (P.44).



Cross Reference:

Check Point (Portable) (P.44)

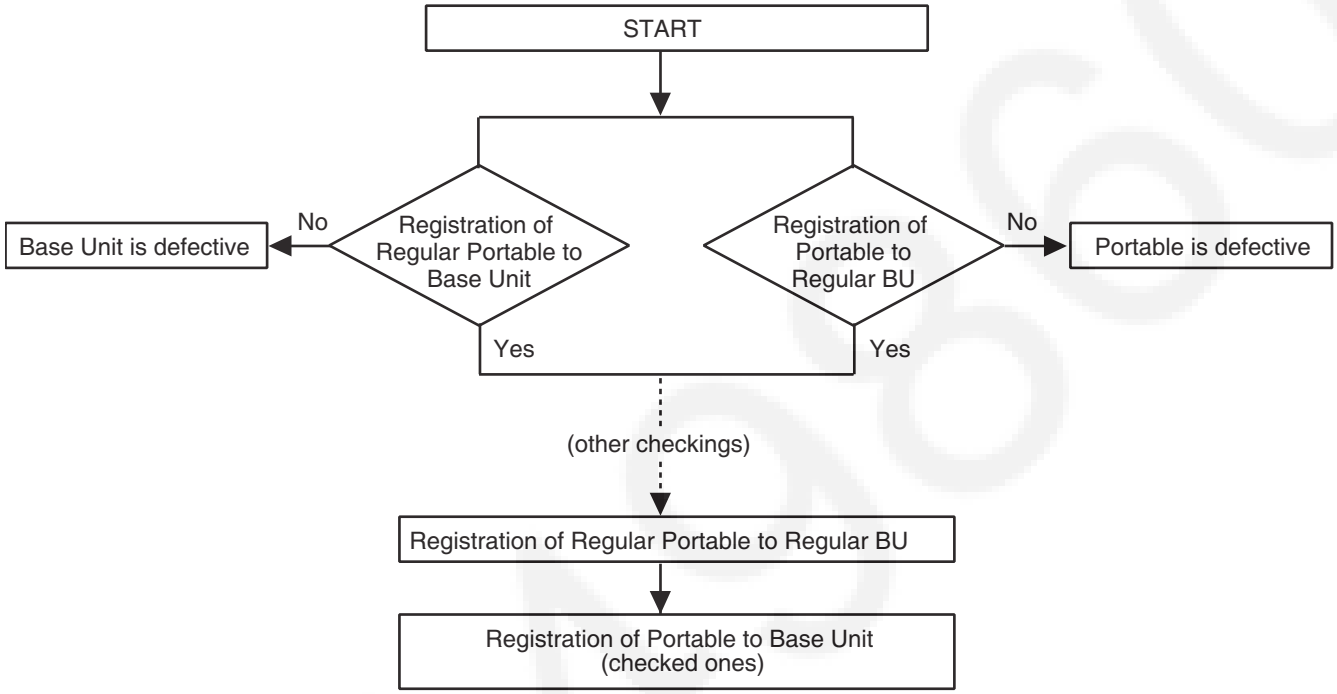
9.1.4. Check the RF part

9.1.4.1. Finding out the Defective part

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

After All the Checkings or Repairing

1. Re-register the checked Portable to the checked Base Unit, and Regular P to Regular BU.

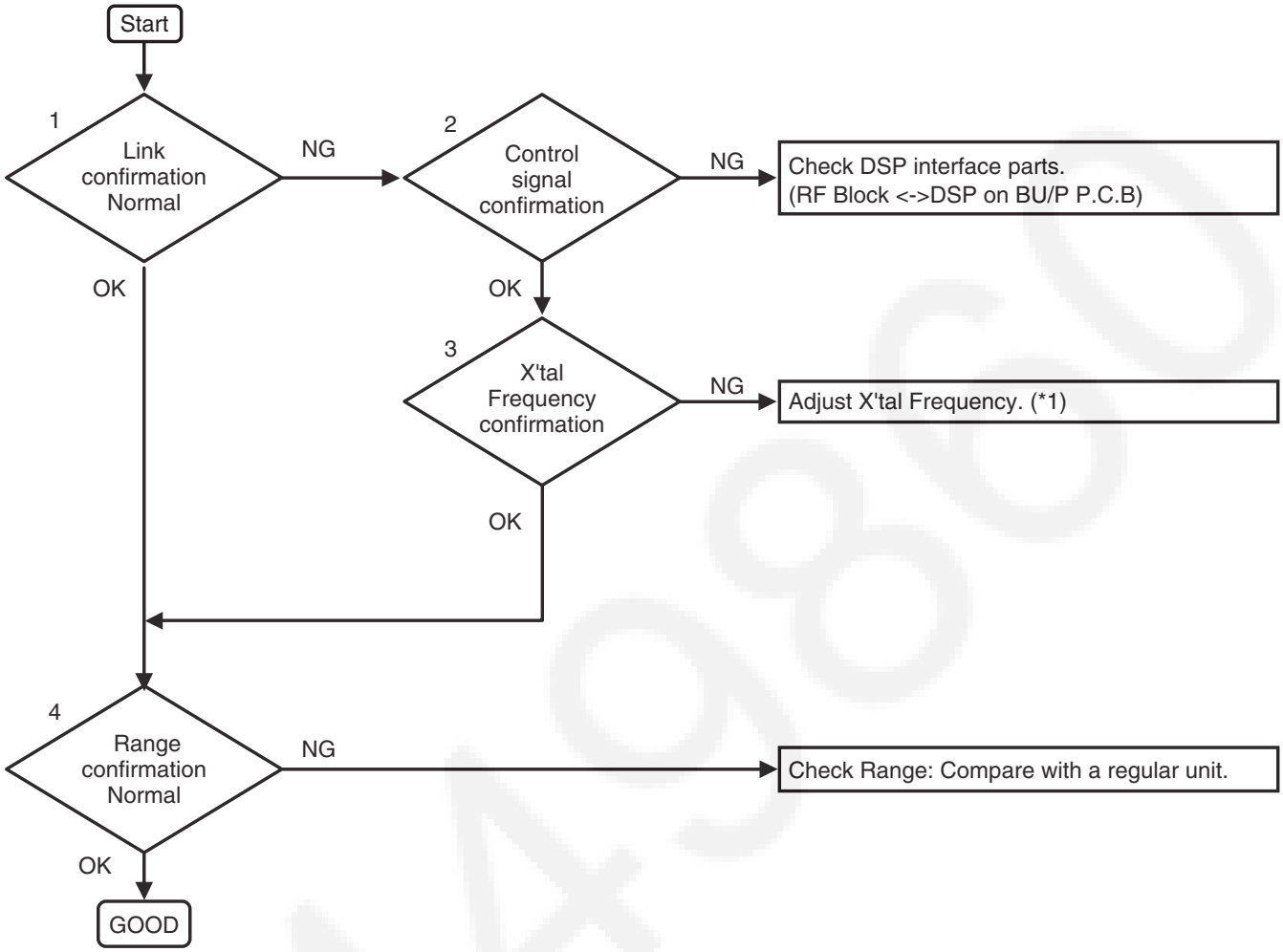


Note:

If you need to register a Portable, refer to **Registering a Portable to the Base Unit** (P.18)

9.1.4.2. RF Check Flowchart

Each item (1 ~ 4) of RF Check Flowchart corresponds to **Check Table for RF part** (P.36).
Please refer to the each item.



Note:
(*1) Base unit - refer to (H) of **Check Point (Base Unit)** (P.40)

9.1.4.3. Check Table for RF part

No.	Item	BU (Base Unit) Check	P (Portable) Check
1	Link Confirmation Normal	1. Register Regular P to BU (to be checked). (*1) 2. Press [Talk] key of the Regular HS to establish link.	1. Register P (to be checked) to Regular BU. (*1) 2. Press [Talk] key of the P to establish link.
2	Control signal confirmation	1. Check BBIC interface. (*2)	1. Check BBIC interface. (*2)
3	X'tal Frequency confirmation	1. Check X'tal Frequency. (*3) (10.368 MHz ± 100 Hz)	1. Check X'tal Frequency. (*4) (10.368 MHz ±100 Hz)
4	Range Confirmation Normal	1. Register Regular P to BU (to be checked). (*1) 2. Press [Talk] key of the Regular P to establish link. 3. Compare the range of the BU (being checked) with that of the Regular BU.	1. Register P (to be checked) to Regular BU. (*1) 2. Press [Talk] key of the P to establish link. 3. Compare the range of the P (being checked) with that of the Regular P.

Note:

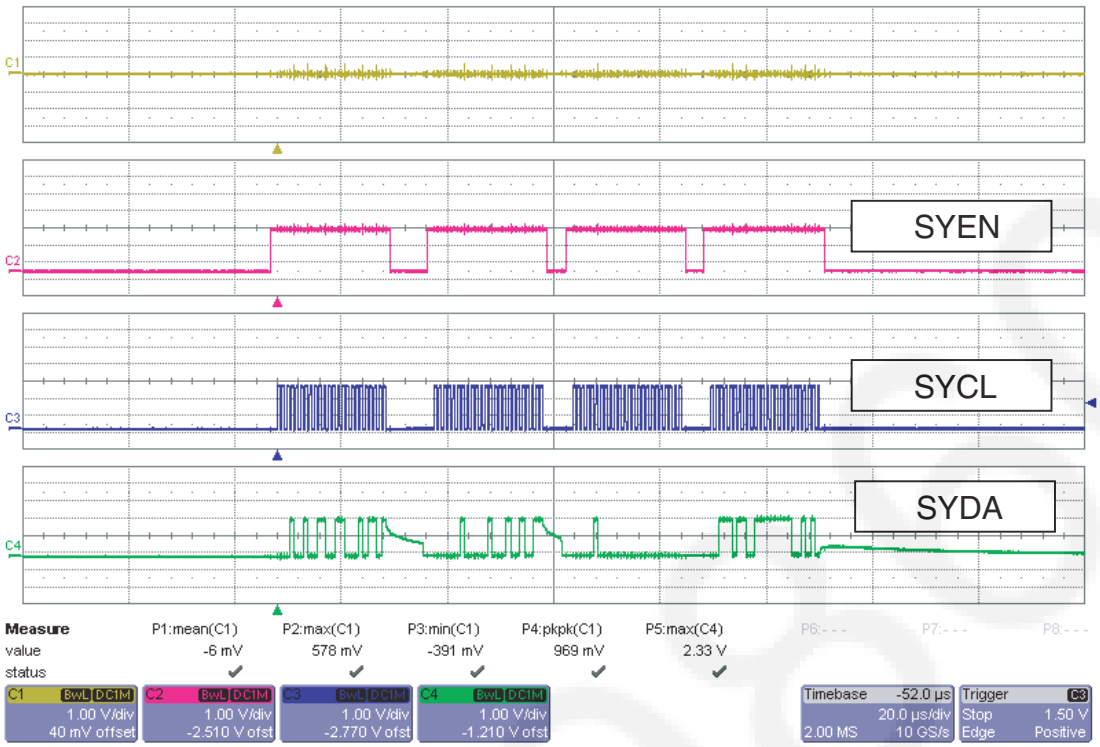
(*1) Refer to **Registering a Portable to the Base Unit** (P.18)

(*2) Refer to **RF-BBIC Interface Signal Wave Form** (P.37)

(*3) Refer to **Adjustment Standard (Base Unit)** (P.58)

(*4) Refer to **Adjustment Standard (Portable)** (P.62)

9.1.4.4. RF-BBIC Interface Signal Wave Form



9.1.5. Check Portable Transmission

Check MIC of Portable.

↓ OK

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

Cross Reference:
Signal Route (P.14)

9.1.6. Check Portable Reception

Check Portable Speaker in **How to Check the Portable Speaker or Receiver**.

↓ OK

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

Cross Reference:
How to Check the Portable Speaker or Receiver (P.70).
Signal Route (P.14)

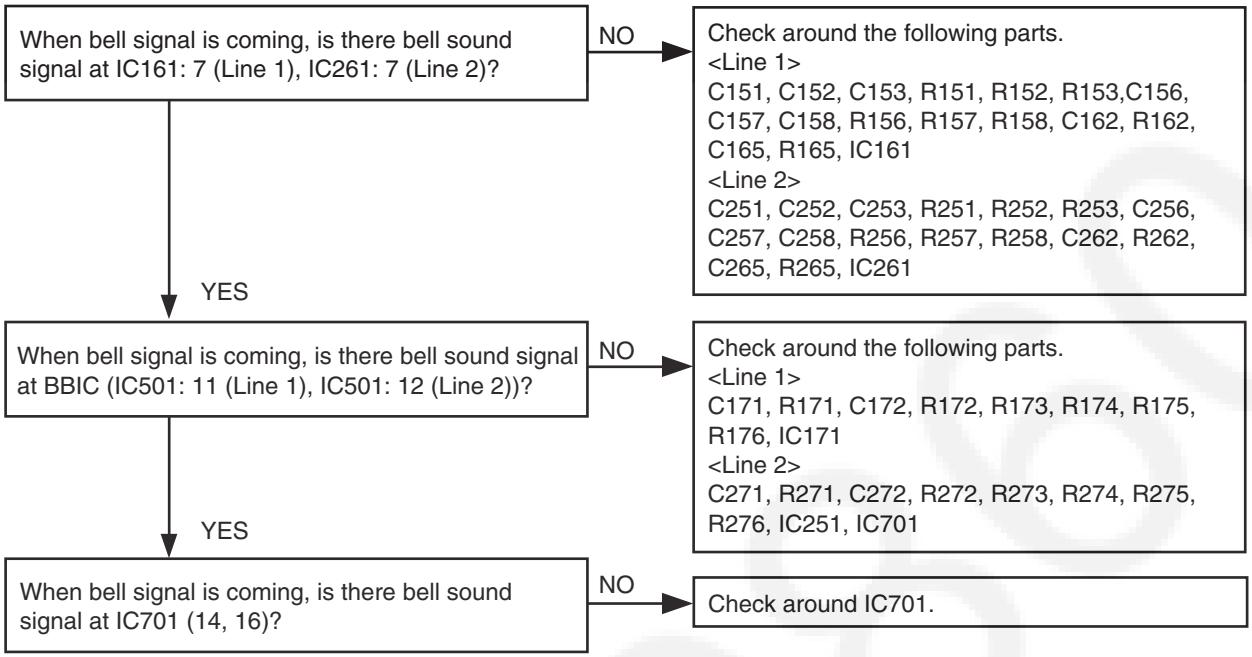
9.1.7. Check Caller ID

Check Caller ID in **Signal Route**.

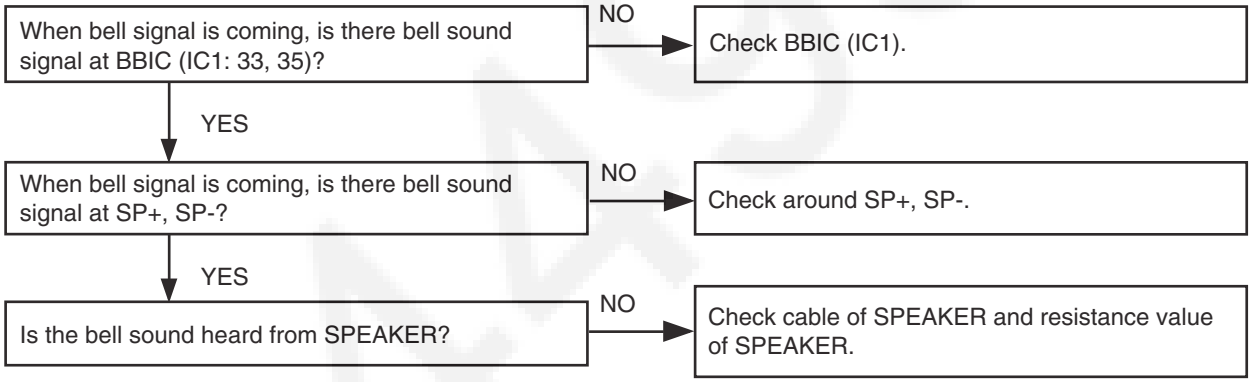
Cross Reference:
Signal Route (P.14)

9.1.8. Bell Reception

9.1.8.1. Base Unit



9.1.8.2. Portable



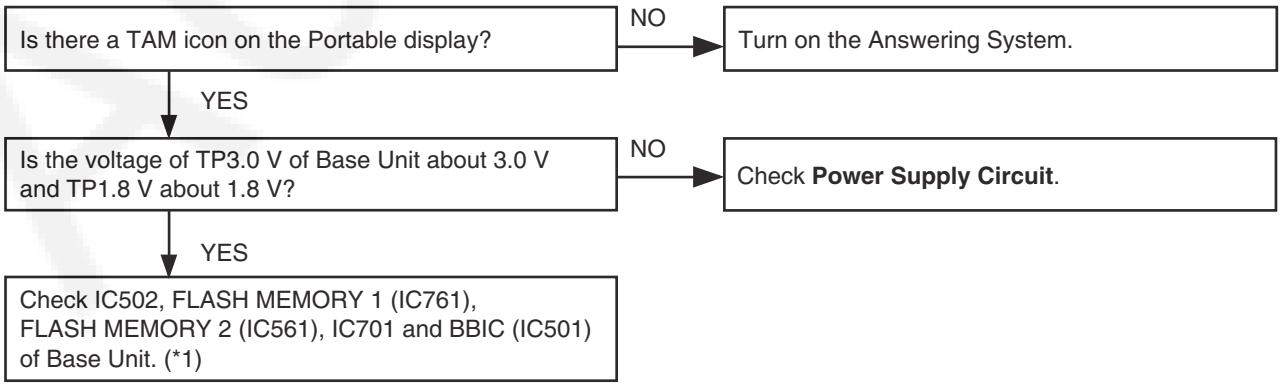
Cross Reference:

Telephone Line Interface (P.10)

Check Link (P.30)

How to Check the Portable Speaker or Receiver (P.70)

9.1.9. Check TAM Operation



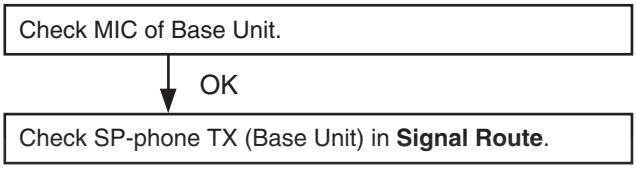
Cross Reference:

Power Supply Circuit (P.9)

Note:

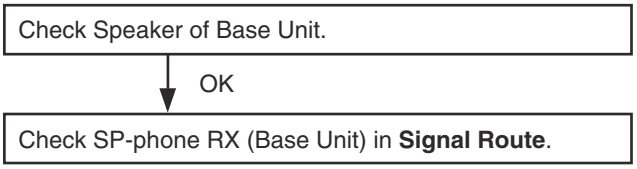
(*1) When replacing FLASH MEMORY 1 (IC761), TAM data needs to be written to it. Refer to **How to download the data** (P.63) of **Things to Do after Replacing IC**.

9.1.10. Check SP-phone Transmission



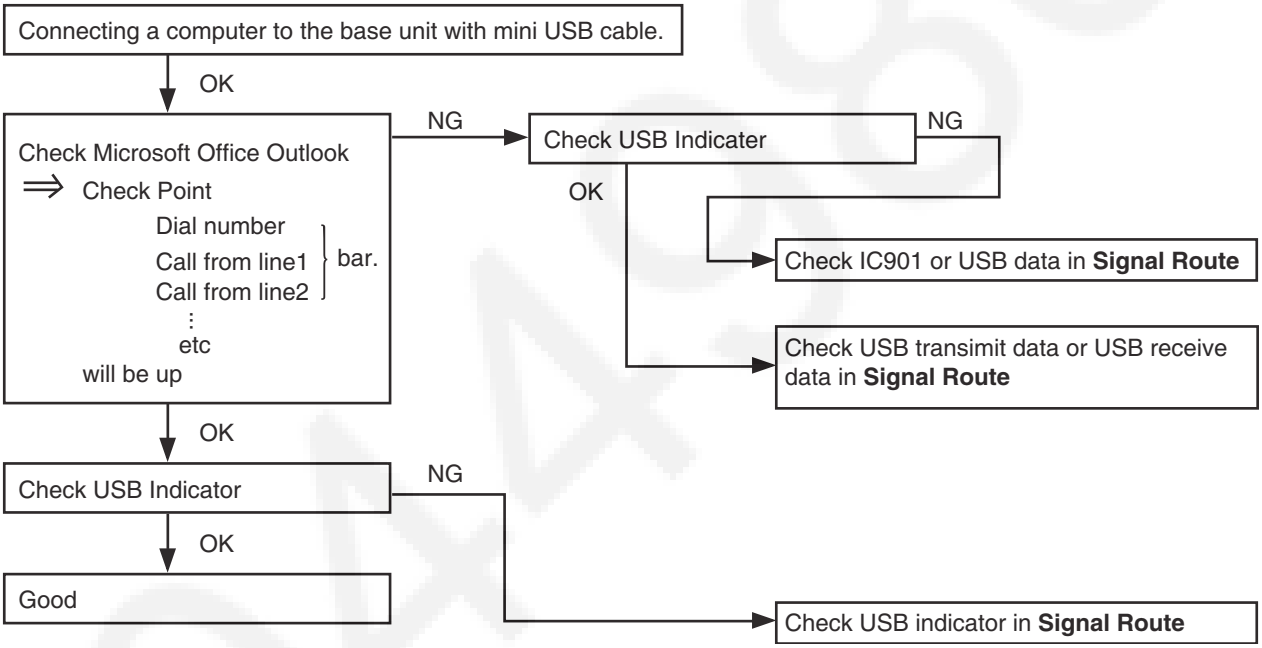
Cross Reference:
Signal Route (P.14)

9.1.11. Check SP-phone Reception



Cross Reference:
Signal Route (P.14)

9.1.12. Check USB Function



Cross Reference:
Signal Route (P.14)

Note:
When replacing USB (IC901), VID and PID and Product string need to be written to it. Refer to **How to download the data** (P.63) of Things to Do after Replacing IC.

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

9.2.1. Check Point (Base Unit)

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

Note:

After the measuring, suck up the solder of TP.

The connections of simulator equipment are as shown in **Adjustment Standard (Base Unit)** (P.58).

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)	4.0 V Supply Confirmation	TP4V	1. Confirm that the voltage between test point TP4V and GND is 4.0 V ± 0.2 V.	IC341, F301, R341, R342, C301, C303, C341, C342, C386
(**B**)	3.3 V Supply Confirmation	TP+3.3 V	1. Confirm that the voltage between test point TP3.6 V and GND is 3.3 V ± 0.2 V.	IC331, R963, R964, C332
(**C**)	2.5 V Supply Confirmation	TP+2.5 V	1. Confirm that the voltage between test point TP2.5 V and GND is 2.5 V ± 0.2 V.	IC321, R322, R321, C321
(**D**)	3.0 V Supply Confirmation	TP+3.0 V	1. Confirm that the voltage between test point TP3.0 V and GND is 3 V ± 0.2 V.	Q381, R381, R382, R383, C382
(**E**)	1.8 V Supply Confirmation	TP+1.8 V	1. Confirm that the voltage between test point TP1.8 V and GND is 1.8 V ± 0.1 V.	Q386, R386, C388
(**F**)*	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: C8D7 / program number: DB01AC	IC501, X501, R511, C511, C512, IC561
(**G**)*	EEPROM Confirmation	-	1. EEPROM Confirmation (Execute the command “ChkTG9471_XXX_RevYYY.bat”). XXX: country code YYY: revision number 2. Confirm the returned checksum value. 3. The checksum is displayed in the last output line. **Note:** "XXX" “YYY” and “checksum” vary depending on the country version. You can find them in the batch file.	IC551, R552, R553, R554, C551
(**H**)*	BBIC Clock Adjustment	CLK	1. Check X’tal Frequency. (10.368 MHz ± 100 Hz). Input Command “rdeeprom 00 01 01”, then you can confirm the current value. 2. If the frequency is not 10.368 MHz ± 100 Hz, Adjust the frequency of CLK executing the command “setfreq xx (where xx is the value)” so that the reading of the frequency counter is 10.368000 MHz ± 100 Hz.	IC501, X501, R511, C511, C512
(**I**)*	Hookswitch Check with DC Characteristics	-	1. Connect CN101 (Line 1)/CN201 (Line 2) (Telephone Socket) to Tel-simulator which is connected with 600 Ω. 2. Set line voltage to 48 V and line current to 40 mA 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.	<Line 1> PO101, L108, L109, D101, Q101, R102, PC102, Q131, R124, R125 <Line 2> PO201, L208, L209, D201, Q201, PC202, Q231, R224, R225
(**J**)	DTMF Generator Check	-	1. Connect CN101 (Line 1)/CN201 (Line 2) (Telephone Socket) to DTMF tester. (Road=600 Ω) 2. Link Portable and push dial key. 3. Confirm DTMF character. 4. Confirm that the high Group is -6 dBm ± 2 dBm. 5. Confirm that the low Group is -8 dBm ± 2 dBm.	<Line 1> IC501, R177, T146, R128, C128, Q131, R136, R134, R133 <Line 2> IC501, C246, R277, T246, R228, C228, Q231, R236, R232, R234, R233

	Items	Check Point	Procedure	Check or Replace Parts
(**K**)*	Transmitted Power Confirmation	-	Remove the Antenna before starting step from 1 to 7. 1. Configure the DECT tester (CMD60) as follows; <Setting> • Short A_1 and GND. • Test mode: FP • Traffic Carrier: 2 • Traffic Slot: 4 • Mode: Loopback • PMID: 00000 • RF LEVEL = -70 dBm. 2. Execute the command “testmode”. 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 “ANT1”. 7. Confirm that the NTP value at ANT is 17dBm ~ 20.5 dBm.	IC501, IC801, R807, R806, R804, R808, C809, D801, R801, R804, L803, L812, C802, C811
(**L**)*	Modulation Check and Adjustment	-	Follow steps 1 to 6 of **(K)**. 7.Confirm that the B-Field Modulation is -350 ~ -450/+350 ~ +450 kHz/div using data type Fig31. 8.Adjust the B-Field Modulation if required. (Execute the command “readmod” and “wrtmod xx”, where xx is the value.)	IC501, IC801, R807, R806, R804, R808, C809, D801, R801, R804, L803, L812, C802, C811
(**M**)*	Frequency Offset Check	-	Follow steps 1 to 6 of **(K)**. 7.Confirm that the frequency offset is < ± 45 kHz.	IC501, IC801, R807, R806, R804, R808, C809, D801, R801, R804, L803, L812, C802, C811
(**N**)*	Frequency Drift Confirmation	-	Follow steps 1 to 6 of **(K)**. 7.Confirm that the frequency drift is < ± 30 kHz/ms.	IC501, IC801, R807, R806, R804, R808, C809, D801, R801, R804, L803, L812, C802, C811
(**O**)*	Sensitivity Receiver Confirmation	-	Follow steps 1 to 6 of **(K)**. 7.Set DECT tester power to -90 dBm. 8.Confirm that the BER is < 1000 ppm.	IC501, IC801, R807, R806, R804, R808, C809, D801, R801, R804, L803, L812, C802, C811
(**P**)*	Timing Confirmation	-	Follow steps 1 to 6 of **(K)**. 7.Confirm that the Timing accuracy is < ± 2.0 ppm.	IC501, IC801, R807, R806, R804, R808, C809, D801, R801, R804, L803, L812, C802, C811
(**Q**)*	RSSI Level Confirmation	-	Follow steps 1 to 6 of **(K)**. 7.Execute the command “readrssi”. 8. Confirm that the returned value is 21 ± A (hex).	IC501, IC801, R807, R806, R804, R808, C809, D801, R801, R804, L803, L812, C802, C811
(**R**)*	Power RAMP Confirmation	-	Follow steps 1 to 6 of **(K)**. 7.Confirm that Power RAMP is matching.	IC501, IC801, R807, R806, R804, R808, C809, D801, R801, R804, L803, L812, C802, C811

	Items	Check Point	Procedure	Check or Replace Parts
(**S**)	Audio Check	-	1. Link with Portable. 2. Input -45 dBm/1kHz to MIC of Portable. Measure the Level at Line I/F and distortion level. 3. Confirm that the level is -8 dBm ± 2 dBm and that the distortion level is < 5 % at TEL Line (600 Ω Load). 4. Input -20 dBm/1 kHz to Line I/F. Measure the level at Receiver of Portable and distortion level (*Receive volume set to second position from minimum). 5. Confirm that the level is -25 dBm ± 2 dBm and that the distortion level is < 5 % at Receiver (Volume Middle, 150 Ω Load).	<Line 1> PO101, L108, L109, D101, Q101, R102, PC102, Q131, R124, R125 <Line 2> PO201, L208, L209, D201, Q201, D202, PC202, Q231, R224, R225
(**U**)*	TAM Operation Confirmation	-	1. TAM Confirmation (Execute the command “sendchar_VPI”) 2. Confirm the returned Value (Value is “JFR7AA 00”).	IC701, IC761, Q772, Q773

9.2.2. Check Point (Charger Unit)

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)	Charging Check	-	1. Connect Charge Contact 12 Ω/2 W resistor between charge+ and charge-. 2. Measure and confirm voltage across the resistor is 3.3 V ± 0.2 V.	R2, R1, R3, R4

Note:

After the measuring, suck up the solder of TP.

The connection of adjustment equipment is as shown in **Adjustment Standard (Charger Unit)** (P.59).

9.3. Troubleshooting by Symptom (Portable)

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

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 (Portable)** (P.44)

9.3.1. Check Point (Portable)

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

Note:

After the measuring, suck up the solder of TP.

*: **How to install Batch file into P.C.** (P.61) is required beforehand.

The connections of adjustment equipment are as shown in **Adjustment Standard (Portable)** (P.62).

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)*	1.8 V Supply Adjustment	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).	IC1, Q2, C48, D1, C1, C44, R12, C3, R45, C40, C45, F1, L8
(**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: EB48 / program number: DB02AA	IC1, X1, RA61, R64, R66
(**C**)*	EEP-ROM Confirmation	-	1. EEP-ROM Confirmation (Execute the command "ChkTGA939XXrevYY.bat"). XX: country code YY: revision number 2. Confirm the returned checksum value. **Note:** "XX", "YY", and "checksum" vary depending on the country version. You can find them in the batch file.	IC1, IC3, R40~R42, C172
(D)	Charge Control Check & Charge Current Monitor Check	-	1. Apply 3.5 V between CHG(+) and CHG(-) with DC power supply and set current limit to 250 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. 3. Decrease current limit of DC power supply to 100 mA. 4. Confirm that the current limit LED of DC power supply is stable. (Current limiter is ON.) (If charge control cannot be confirmed by this procedure, please use battery to portable power supply and try again.)	IC1, Q4 Q9, D7, D8, L4, L5, R6, R7, F1, C1, C3, R2, R30, R31, R8, C147, R45, C15, L8
(**E**)*	Charge Detection (OFF) Check	-	1. Stop supplying 3.5 V to CHG (+) and CHG (-). 2. Confirm the indication of "charging" has been cleared.	IC1, Q4 Q9, D7, D8, L4, L5, R6, R7, F1, C1, C3, R2, R30, R31, R8, C147, R45, C15

	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) 6c ≦ XX ≦ 71: No need to adjust b) XX: 6A ~ 6B: Need to adjust XX: 72 ~ 74: Need to adjust Write AD value of 2.25 V to EEPROM. ex) read data: XX = 6A, write data: YY = 6A read data: XX = 73, write data: YY = 73 EEPROM = 0004(Low Voltage) write “YY” Execute the command “wreeprom 00 04 01 YY”. EEPROM = 0005(No Voltage) write ‘’YY - 1D’’ Execute the command “×wreeprom 00 05 01 ZZ”. EEPROM = 000A(Low Voltage BL) write “YY - 16” Execute the command “wreeprom 00 0A 01 WW”. **Note:** ZZ = YY - C No Voltage writing data limit is ‘00’. c) XX: 00 ~ 69: Reject XX: 75 ~ FF: Reject	IC1, F1, C1 C3, R12, R45
(**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, F1, C1 C3, R12, R45
(**H**)*	BBIC Clock Adjustment	CLK	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 CLK executing the command “sendchar sfr xx xx (where xx is the value)” so that the reading of the frequency counter is 10.368000 MHz ± 100 Hz. Note: Clear the registered information for Base Unit before measurement, because the Frequency will not possibly get stable due to the registered information. Pressing the button of “3” “7” “9” “#” clears the registration. Register to it on Base Unit after measurement.	IC1, X1, C47
(**I**)*	Transmitted Power Confirmation	-	Remove the Antenna before starting step from 1 to 4. 1. Configure the DECT tester (CMD60) as follows; <Setting> • Test mode: PP • RFPI: 0102030405 • Traffic Carrier: 5 • 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 19 dBm ~ 25 dBm.	IC1, C808~C814, L802~L804, C825, C834, C819, IC801, R107, R108, C117, C118, C841, C125, C842, DA1, C801~C804, D801,D802, C837, C826, C822, C820, C832, C833, R801~R807
(**J**)*	Modulation Check and Adjustment	-	Follow steps 1 to 3 of **(K)**. 4.Confirm that the B-Field Modulation is -370±30/ +370±50 kHz/div & Modulated width ≧ 690 kHz using data type Fig 31.	IC1, C808~C814, L802~L804, C825, C834, C819, IC801, R107, R108, C117, C118, C841, C125, C842, DA1, C801~C804, D801,D802, C837, C826, C822, C820, C832, C833, R801~R807

	Items	Check Point	Procedure	Check or Replace Parts
(**K**)*	Frequency Offset Confirmation	-	Follow steps 1 to 3 of **(I)**. 4.Confirm that the frequency Offset is < ± 50 kHz.	IC1, C808~C814, L802~L804, C825, C834, C819, IC801, R107, R108, C117, C118, C841, C125, C842, DA1, C801~C804, D801,D802, C837, C826, C822, C820, C832, C833, R801~R807
(**L**)*	Frequency Drift Confirmation	-	Follow steps 1 to 3 of **(I)**. 4.Confirm that the frequency Drift is < ± 35 kHz/ms.	IC1, C808~C814, L802~L804, C825, C834, C819, IC801, R107, R108, C117, C118, C841, C125, C842, DA1, C801~C804, D801,D802, C837, C826, C822, C820, C832, C833, R801~R807
(**M**)*	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.	IC1, C808~C814, L802~L804, C825, C834, C819, IC801, R107, R108, C117, C118, C841, C125, C842, DA1, C801~C804, D801,D802, C837, C826, C822, C820, C832, C833, R801~R807
(**N**)*	Power RAMP Confirmation	-	Follow steps 1 to 3 of **(I)**. 4.Confirm that Power RAMP is matching.	IC1, C808~C814, L802~L804, C825, C834, C819, IC801, R107, R108, C117, C118, C841, C125, C842, DA1, C801~C804, D801,D802, C837, C826, C822, C820, C832, C833, R801~R807
(**O**)	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 40 mA. 3. Input -45 dBm/1KHz to MIC and measure Line output level. 4. Confirm that the level is -8 dBm ± 2 dBm and that the distortion level is < 5% at TEL Line (600 Ω Load). 5. Input -20 dBm/1KHz to Line I/F and measure Receiving level at REV+ and REV-. 6. Confirm that the level is -22 dBm ± 2 dBm and that the distortion level is < 5% at Receiver. (vol = 2)	IC1, R23, C12, D19, D20, C96, C97, R215, R27, RA4, C11, C13, R28, D3, D4, L10, L11, MIC, L9

	Items	Check Point	Procedure	Check or Replace Parts
(**P**)	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 40 mA. 3. Set the portable off-hook using SP-Phone key. 4. Input -25 dBm/1KHz to Line I/F and measure Receiving level at SP+ and SP-. 5. Confirm that the level is -14 dBm ± 2 dBm and that the distortion level is < 5%. (vol = 3)	IC1, R23, C12, C73, D13, D14, R152, C80, L10, L11, MIC, C11, C13, RA4, R27, R28, R208, R209, C96, C97, R215, C72
(**Q**)	Charge Pump 2.5V Supply Confirmation	CP2.5V	1. Confirm that the voltage between testpoint and CP2.5V and GND is 2.5V -0.1/+0.3V.	C52, C53, C49
(**R**)	Change Pump 4.0V Supply Confirmation	CP4.0V	1. Confirm that the voltage between testpoint CP4.0V and GND is 4.0V I0.2V.	C50, C51

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 portable will improve it to some extent.

Conditions

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

Setting Method

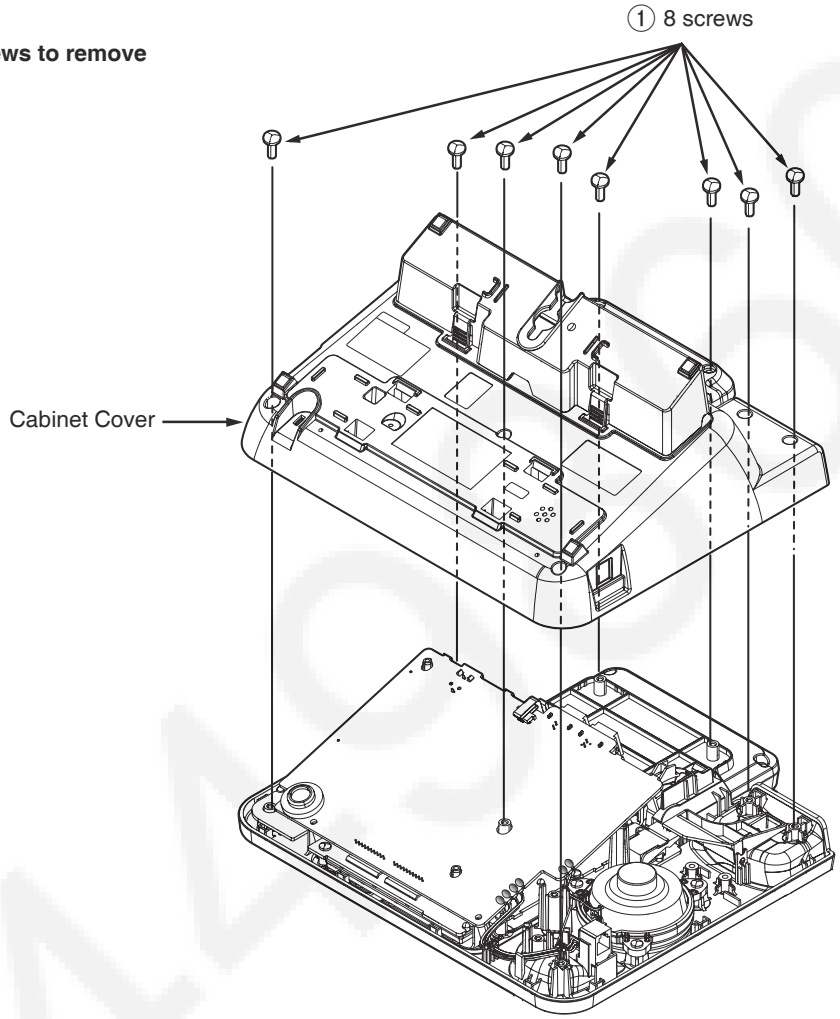
• Change the portable address of EEPROM (0129) from 00 to 01 by **Engineering Mode**.

10 Disassembly and Assembly Instructions

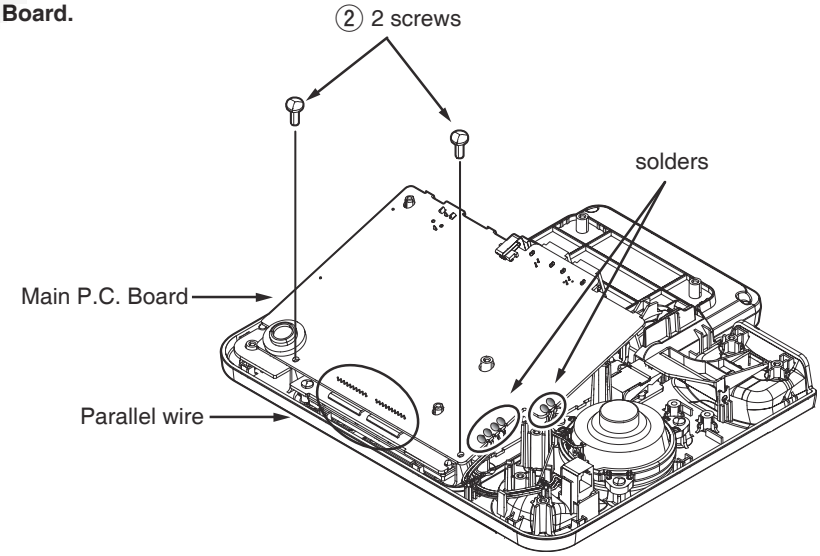
10.1. Disassembly Instructions

10.1.1. Base Unit

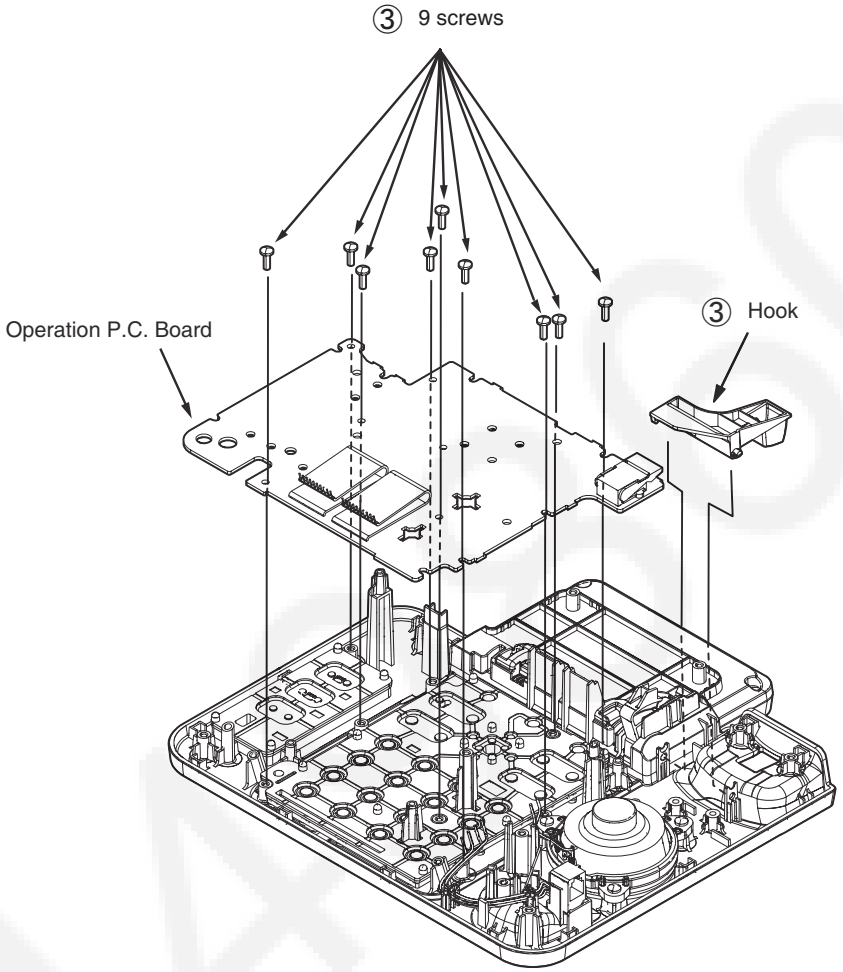
① **Remove the 8 screws to remove the cabinet cover.**



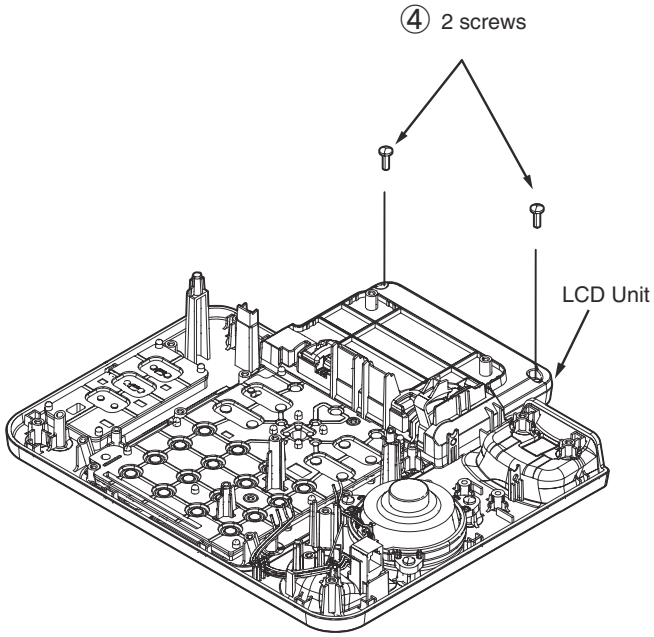
② **Remove 2 screws, Parallel wire and solders to remove the main P.C. Board.**



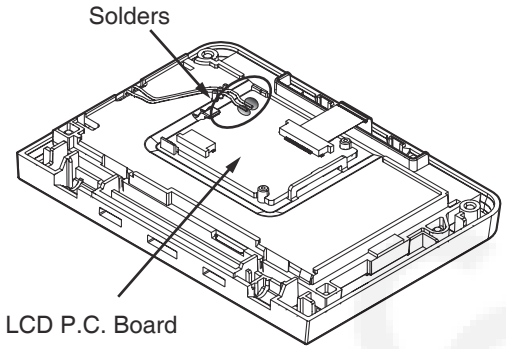
③ **Unhook the hook and remove the 9 screws to remove the operational P.C. board.**



④ **Remove the 2 screws to remove the LCD Unit.**

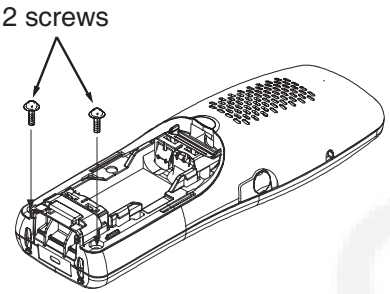


⑤ **Remove solders and connectors to remove the LCD P.C. board.**

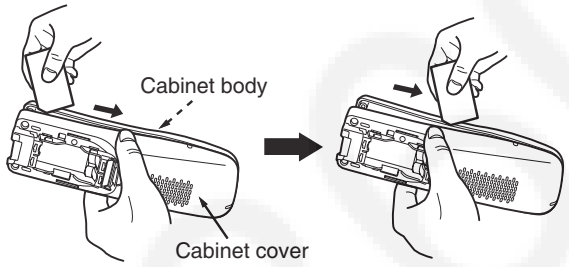


10.1.2. Portable

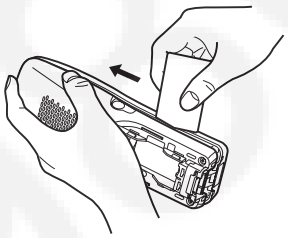
① **Remove the 2 screws.**



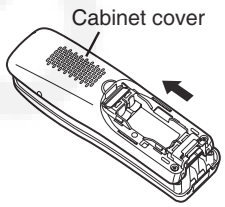
② **Insert a plastic card. (Ex. Used SIM card etc.) between the cabinet body and the cabinet cover, then pull it along the gap to open the cabinet.**



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



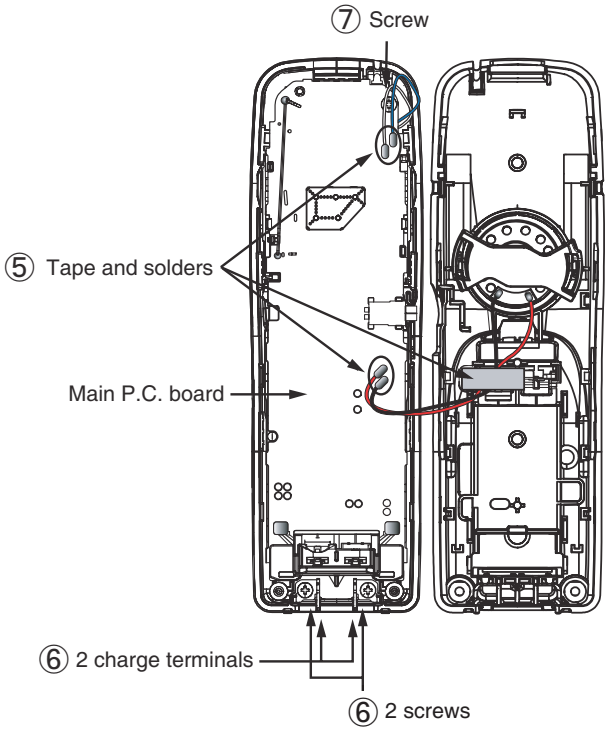
④ **Remove the cabinet cover by pushing it upward.**



⑤ **Remove the tapes and solders.**

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

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

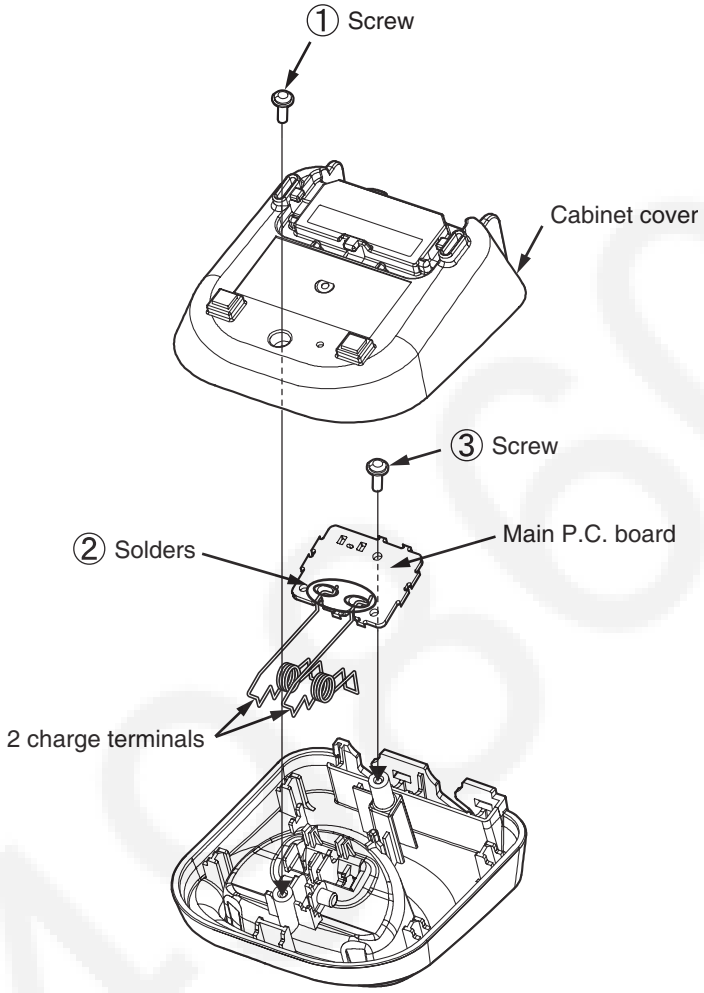


10.1.3. Charger Unit

① **Remove the screw to remove the cabinet cover.**

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

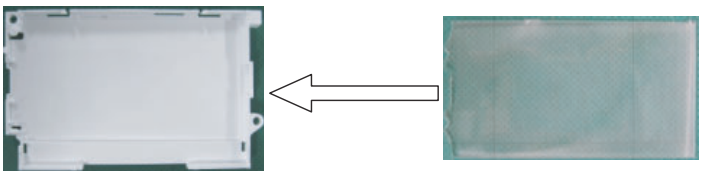
③ **Remove the screw to remove the main P.C. board.**



10.2. Assembly Instructions

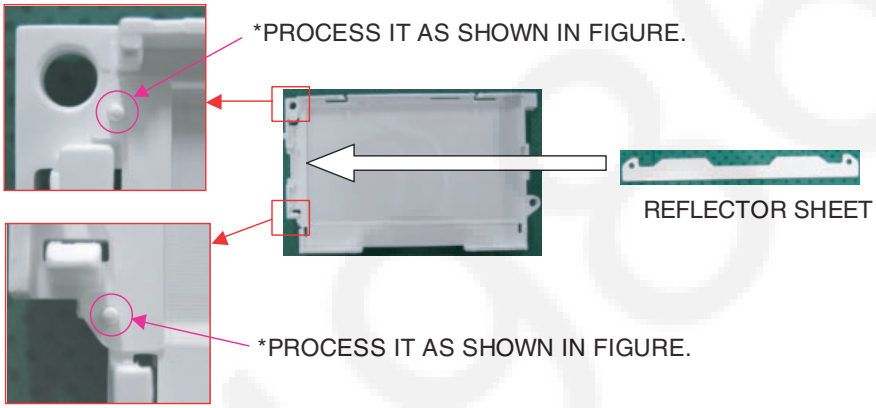
10.2.1. How to Replace the Base unit LCD

①

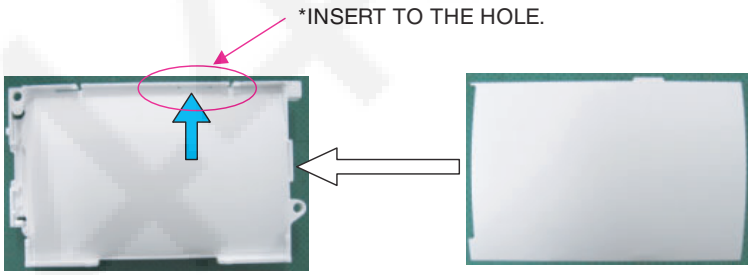


LCD HOLDER　　LCD PLATE

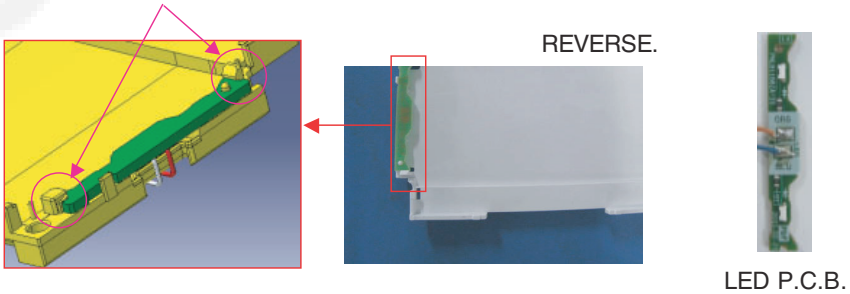
②



③



④ *PROCESS IT AS SHOWN IN FIGURE.

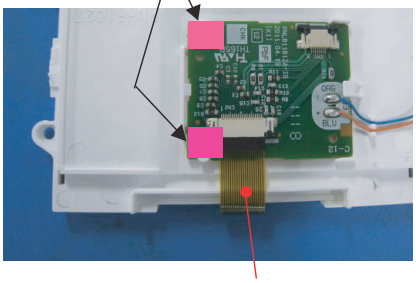


⑤

LCD

Attach LCD P.C.B under conditions to push edge face.

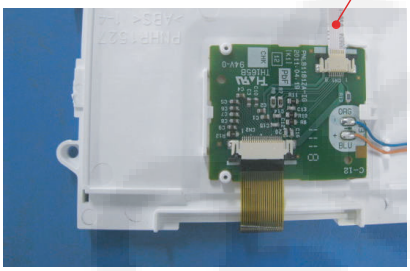
⑥



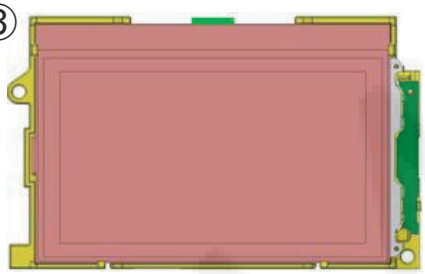
LCD P.C.B.

⑦

FFC/8

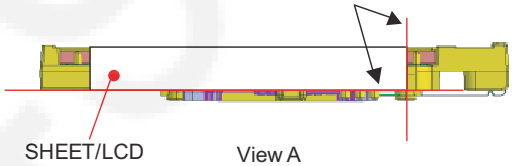


⑧



STICK IT ALONG THESE LINES.

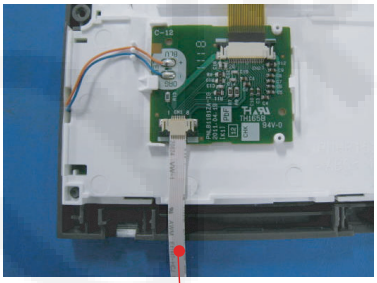
View A



SHEET/LCD

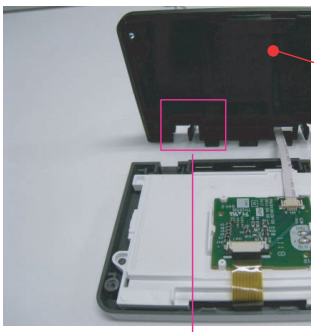
View A

⑨

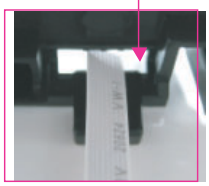


GRILL/LCD

⑩



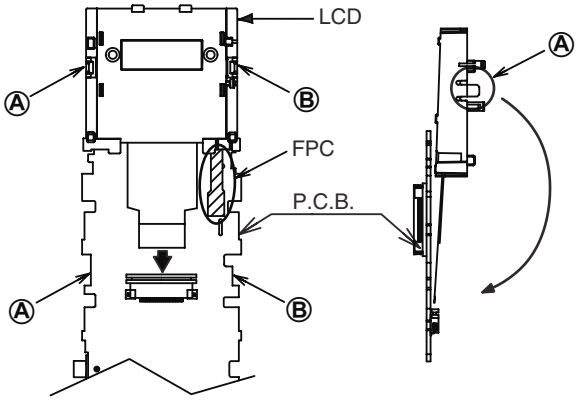
COVER/LCD



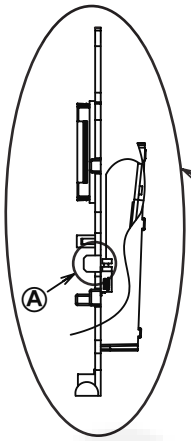
*INSERT FFC IN THE HOLE OF COVER/LCD.

10.2.2. How to Replace the Portable LCD

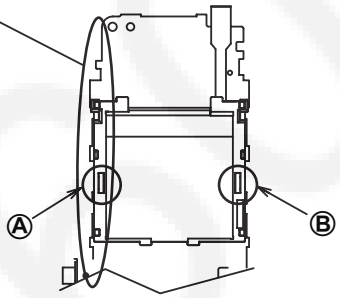
① Attach LCD to P.C.B.
*When attaching the LCD holder,
don't pull the FPC (Flexible Print Circuit).



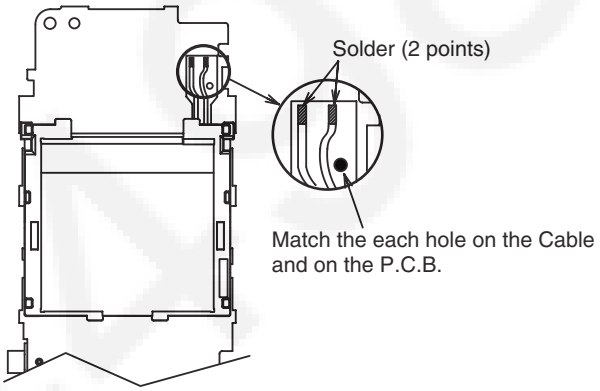
② Locate the Flat Cable inside
as shown.



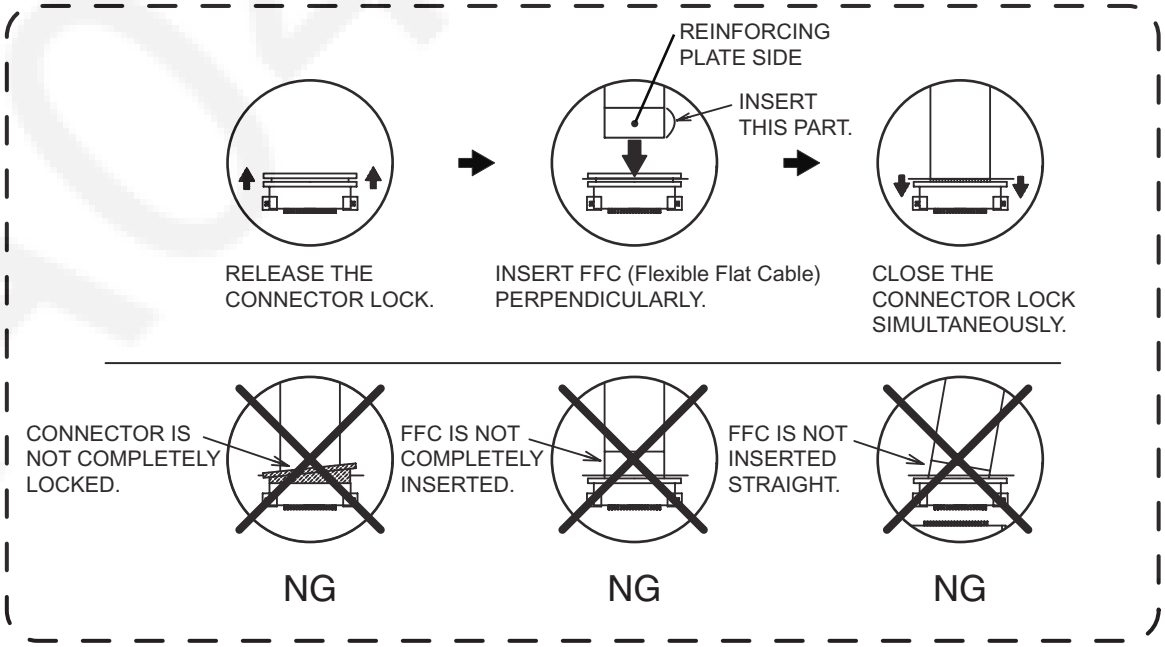
③ After attaching LCD, lock it with
part Ⓐ and Ⓑ.



④ Solder the narrow Cable to the P.C.B.
*When soldering, don't give the load to the FPC.



<Details of step ① above>



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.27)

11.1. Equipment Required

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

11.2. The Setting Method of JIG

<Preparation>

- Serial JIG cable: PQZZ1CD300E*
- PC which runs in DOS mode
- **Batch file CD-ROM** for setting: PNZZTG9471B

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

Note:

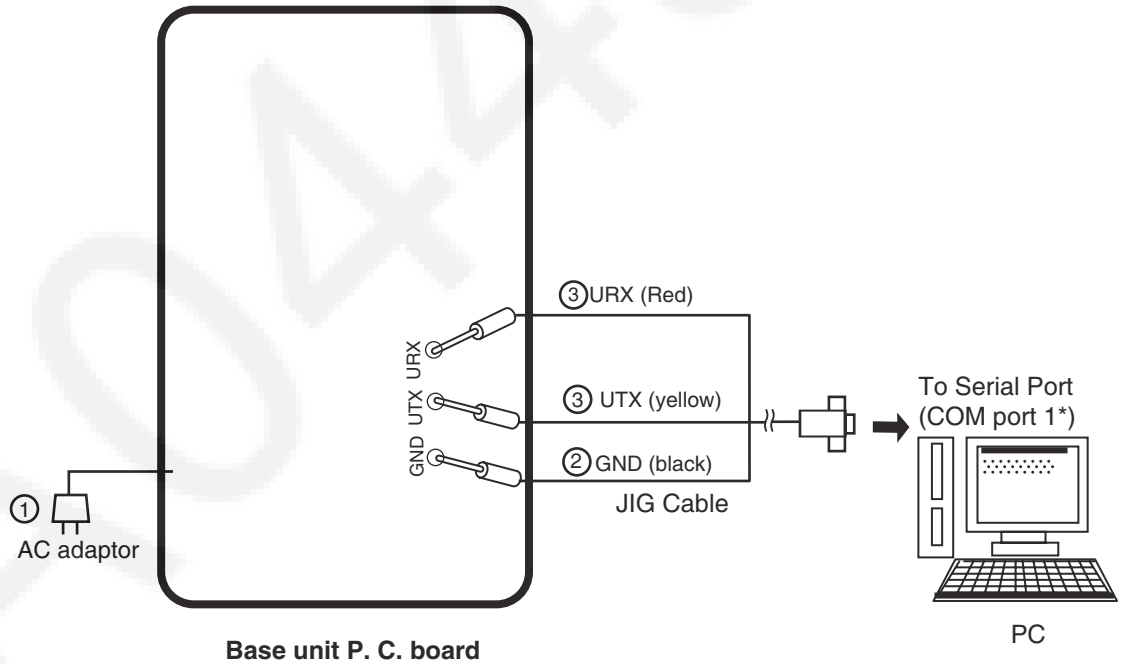
*: If you have the JIG Cable for TCD500 series

11.2.1. Connections (Base Unit)

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

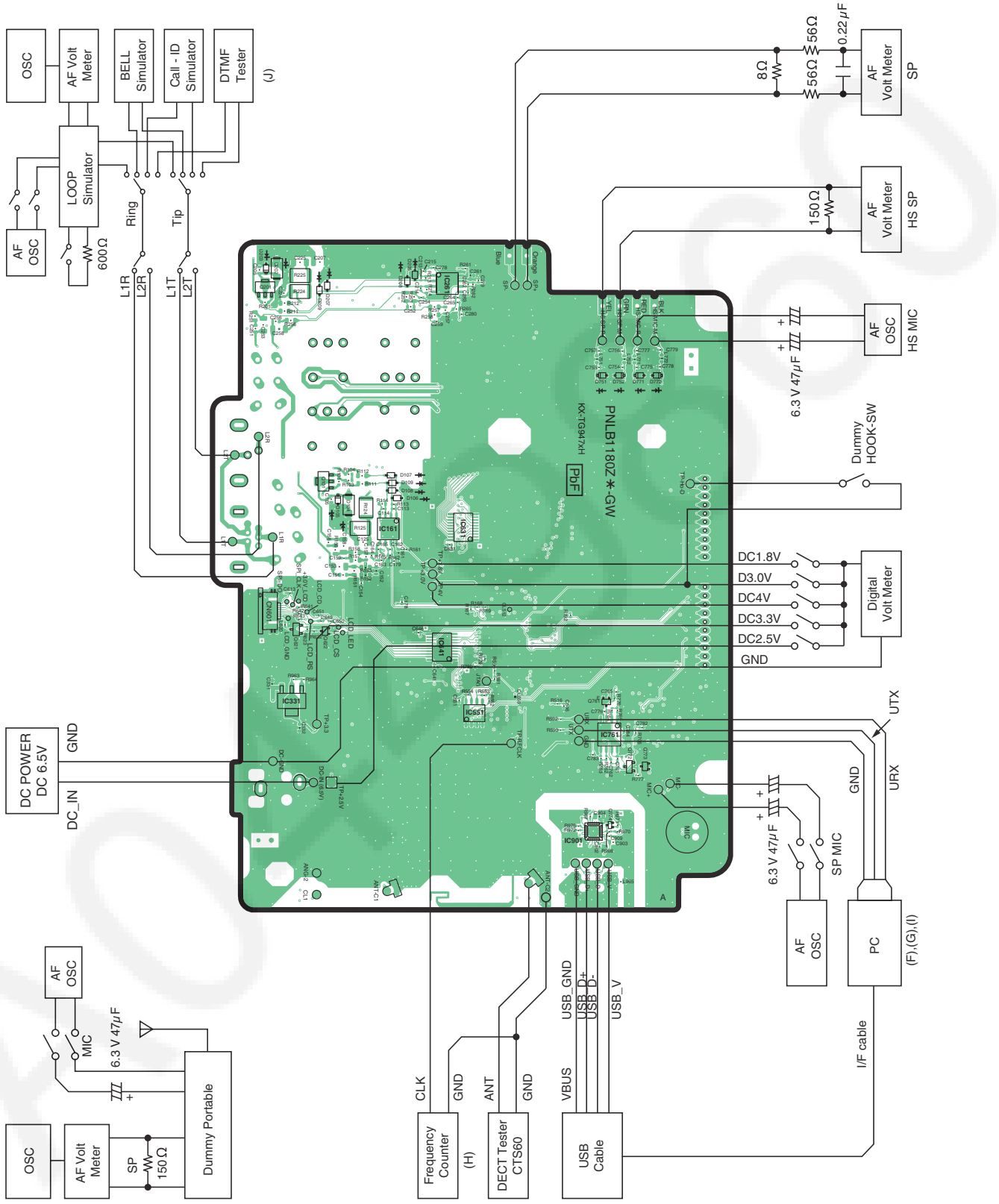
See the table below for frequently used commands.

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.
setfreq	Adjust Frequency of RFIC	Type "setfreq nn".
hookoff1/hookoff2	Off-hook mode on Base Line1 & Line2	Type "hookoff1" for Line1.
hookon1/hookon2	On-hook mode on Base Line1 & Line2	Type "hookon1" for Line1.
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.
bursttx	Burst TX mode	Type "bursttx"
textrx	Test RX mode	Type "testrx"
tph	High TX mode	Type "tph"
tpl	Low TX mode	Type "tpl"

11.3. Adjustment Standard (Base Unit)

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

11.3.1. Bottom View



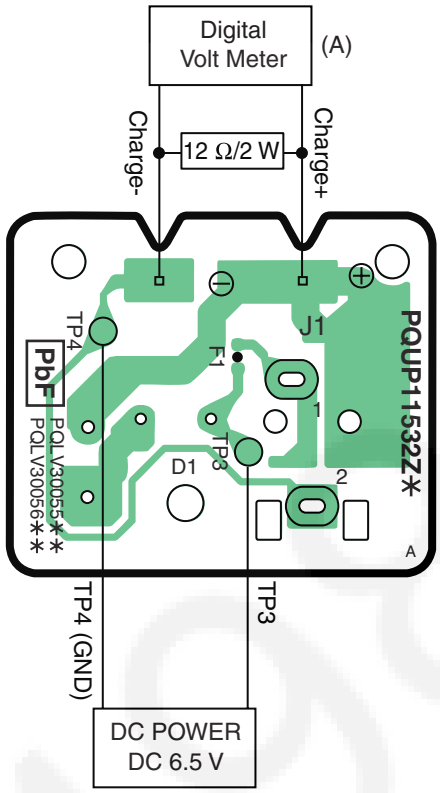
Note:

(F) - (J) is referred to **Check Point (Base Unit)** (P.40)

11.4. Adjustment Standard (Charger Unit)

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

11.4.1. Bottom View



Note:

(**A**) is referred to **Check Point (Charger Unit)** (P.43)

11.5. The Setting Method of JIG (Portable)

This section explains the PC setting to use command required in **Check Point (Portable)** (P.44)

<Preparation>

- Serial JIG cable: PQZZ1CD300E*
- PC which runs in DOS mode.
- **Batch file CD-ROM** for setting: PNZZTG9471B

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

Note:

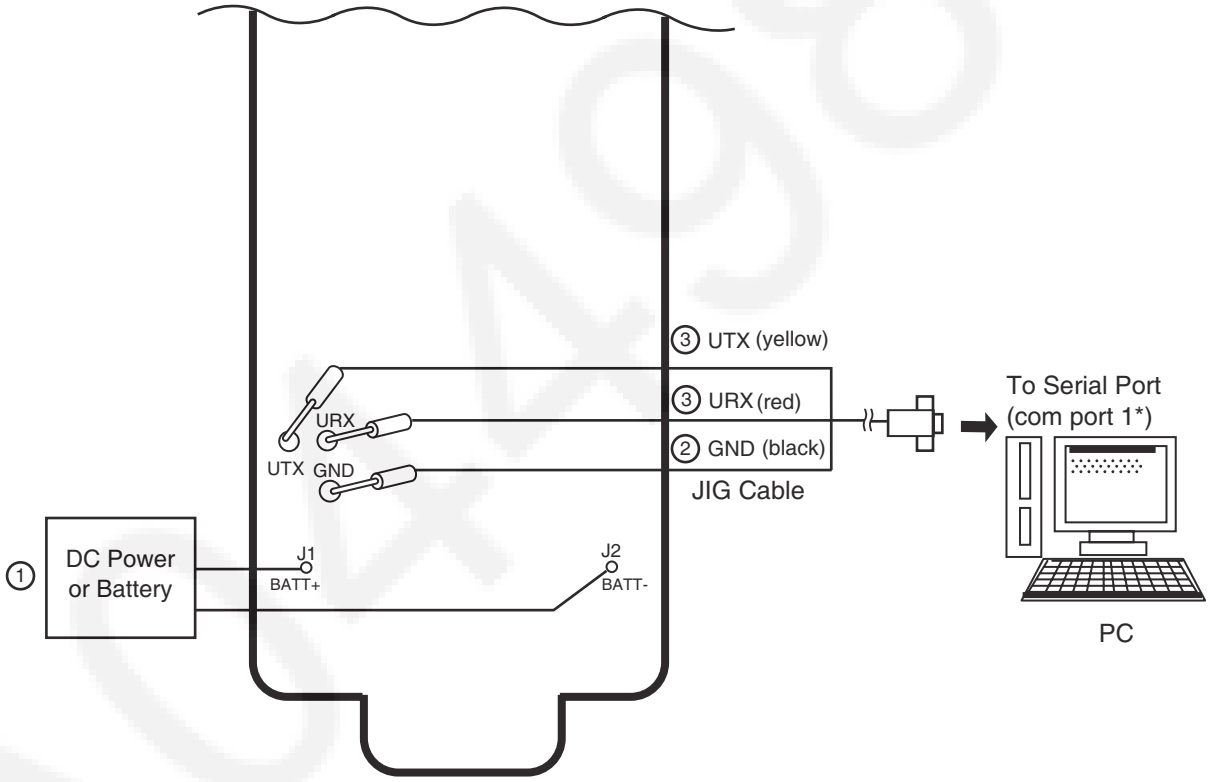
*: If you have the JIG Cable for TCD500 series

11.5.1. 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.



Portable P. C. board

Note:

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

11.5.2. 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.

11.5.3. Commands

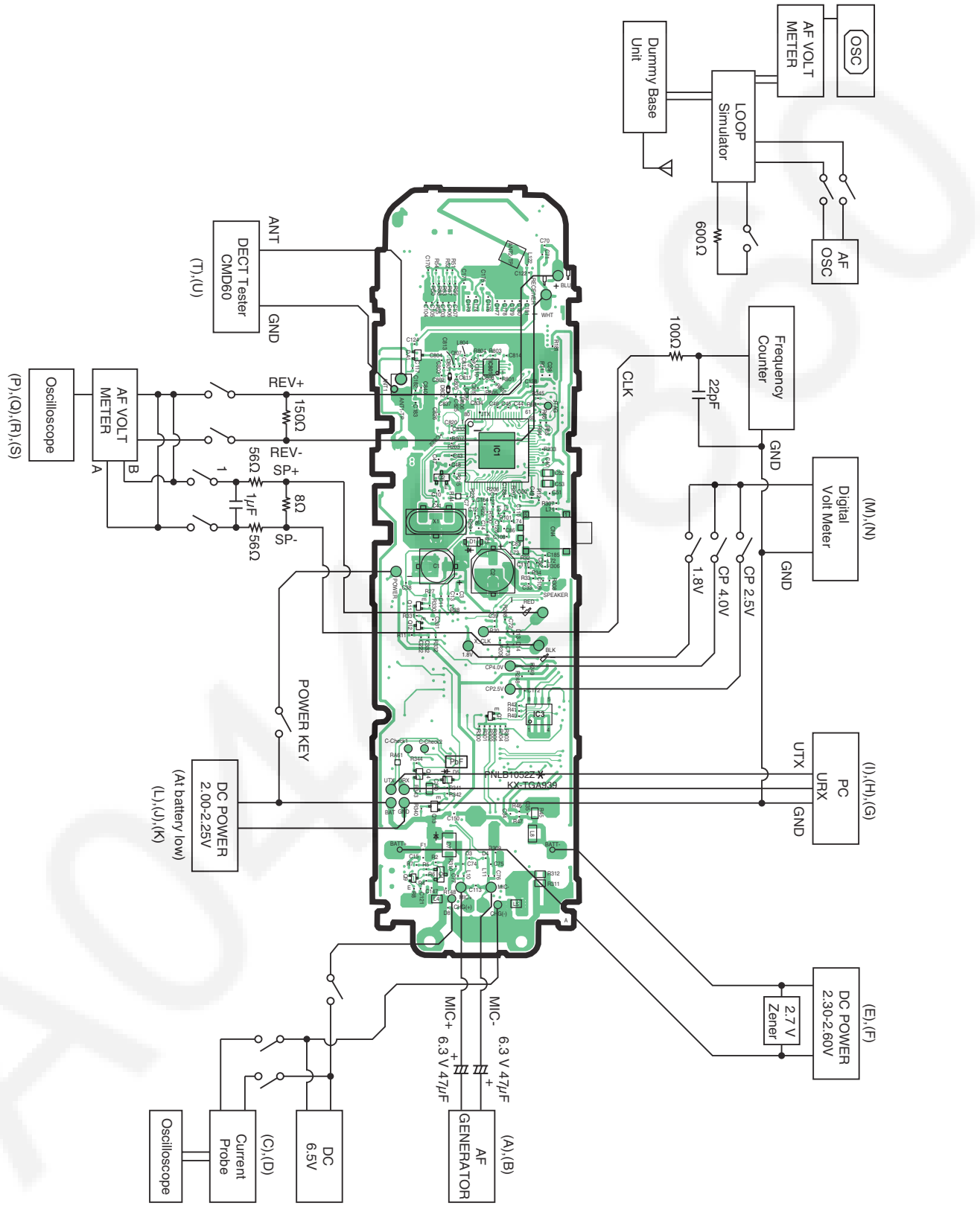
See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of FLASH	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.
setfreq	Adjust Frequency of RFIC	Type "setfreq nn".
getchk	Read checksum	Type "getchk".
wreeprom	Write the data of FLASH	Type "wreeprom 01 23 45". "01 23" is address and "45" is data to be written.
bursttx	Burst TX mode	Type "bursttx"
textrx	Test RX mode	Type "testrx"
tph	High TX mode	Type "tph"
tpl	Low TX mode	Type "tpl"

11.6. Adjustment Standard (Portable)

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

11.6.1. Component View



Note:

(**A**) - (**R**) is referred to **Check Point (Portable)** (P.44)

11.7. 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.

11.7.1. How to download the data

11.7.1.1. Base Unit

First, operate the PC setting according to **The Setting Method of JIG** (P.56). Then download the appropriate data according to the following procedures.

Items		Necessary Adjustment
BBIC (IC501)	Programs for Voice processing, interface for RF and EEPROM	1. Clock adjustment: Refer to Check Point (D). (*1)
EEPROM (IC551)	Adjustment parameter data is stored in memory. (country version batch file, default batch file, etc.)	
X'tal (X501)	System clock	
FLASH1 (IC761)	Voice prompt data is stored in memory. (vary depending on country version)	1) Wait more than 15 seconds after connection the JIG Cable. 2) Execute the command "VPDL2011 -AA ZZZ.bin" (*1). (writing time: approx. 1 min (115200 bps).)
USB IC (IC901)	USB to UART bridge controller	VID PID Product string need to be written to it (*2)

Note:

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

(*2) Refer to **How to be written to USB_IC** (P.66).

11.7.2. How to written to USB_IC

System requirements (PC)

Item	Specifications
CPU	1.0 GHz Intel® Pentium®/Celeron® processor or comparable CPU or higher processor
RAM	512 MB or more
OS	● Microsoft Windows® XP Service Pack 3 or later (32-bit only) ● Microsoft Windows Vista® Service Pack 2 or later ● Microsoft Windows 7 Service Pack 1 or later
Microsoft Office Outlook	● Microsoft Office Outlook 2003 Service Pack 3 or later ● Microsoft Office Outlook 2007 Service Pack 2 or later ● Microsoft Office Outlook 2010 or later (Service Pack)
Hard disk	20 MB or more
Video resolution	1,024 x 768 or higher
Others	● CD-ROM drive ● USB 2.0

CDROM

PNJX1009Z
PNZZTG9471B
(They are available at web site)

11.7.2.1. Downloading software (preparation)

(1) CP210x_VCP_Win_XP_S2K3_Vista_7.exe

You can download the software from Web site as below.

https://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx

Click Download for Windows XP/Server 2003/Vista/7 (v6.3a)
VCP DRIVER Kit

Activate "CP210x_VCP_Win_XP_S2K3_Vista_7.exe" from CDROM (PNZZTG9471B) in the "Driver" folder, and follow the wizard

(2) CP210xSetIDs.exe

https://www.silabs.com/PRODUCTS/INTERFACE/USBTOUART/Pages/usb-to-uart-bridge.aspx

Click tools

Copy "an144sw.zip" to an appropriate folder

(3) Installing the "Telephone Plug-in"

Refer to **Installing the “Telephone Plug-in”** (P.65)

11.7.2.2. Installing the “Telephone Plug-in”

Before installing “Telephone Plug-in”, make sure of the following:
– Microsoft Office Outlook is installed on your computer.
– The base unit is not connected to your computer with the mini USB cable (until instructed to do so).

1 Start Windows and exit all other applications.
- You must be logged in as an administrator in order to install “Telephone Plug-in”.

2 Insert the included CD-ROM into your CD-ROM drive.
- Installation starts automatically. If the installation does not start, double click **[Setup.exe]** in your CD-ROM drive folder to start installing.
- **For Microsoft Windows Vista and Microsoft Windows 7 users:**
  Click **[Run Setup.exe]** when prompted.

3 When the language selection window is displayed, select the desired language and click **[Next]**.

4 When the “Telephone Plug-in” window is displayed, click **[Next]**.

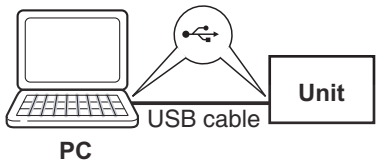
5 Read the license agreement carefully. If you accept the terms of the license agreement, check the box and click **[Next]**.

6 When the “Telephone Plug-in” install shield wizard is displayed, click **[Install]**.

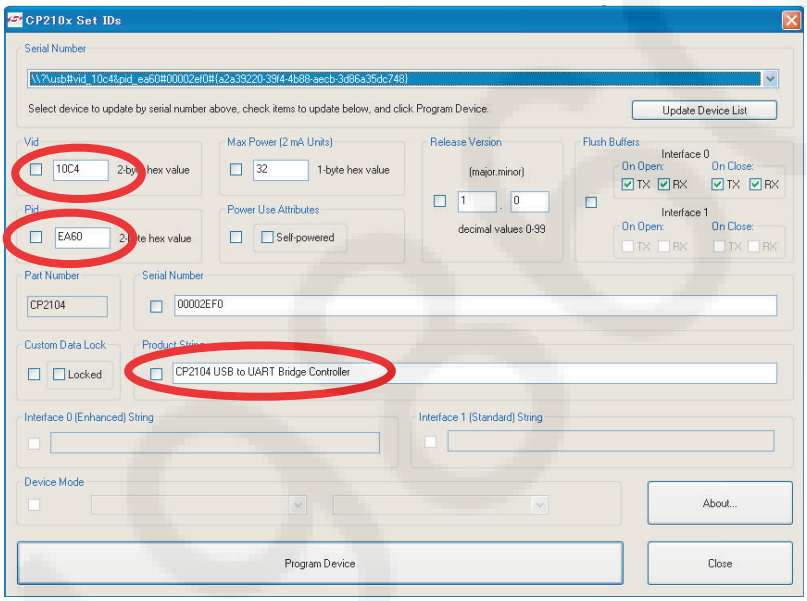
7 When installation is finished, click **[Finish]** to complete the installation. Then remove the CD-ROM from your CD-ROM drive.

11.7.2.3. How to be written to USB_IC

(1) Connect KX-TG9471 to PC with a USB cable.



(2) Activate "AN144SW¥CP210X¥CP210XSETIDs.exe"

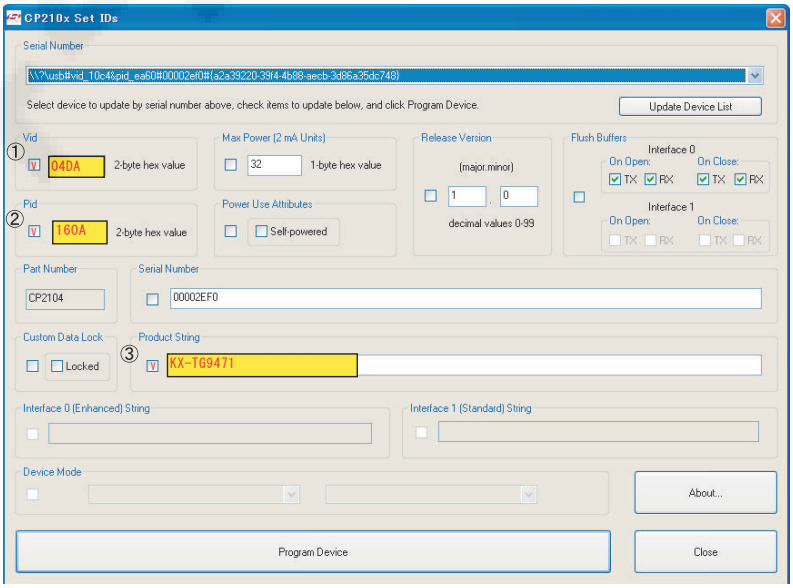


(3) Input parameters

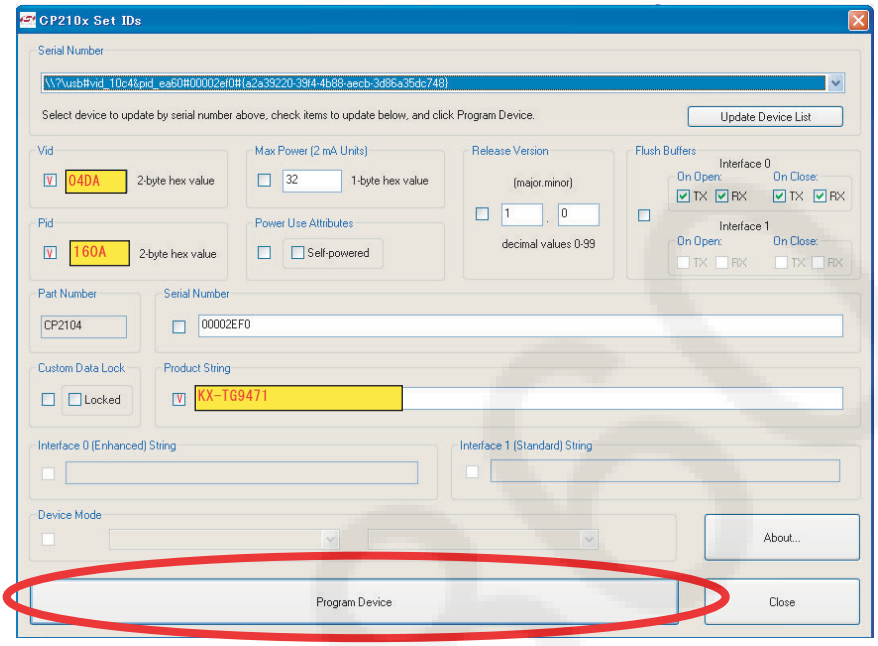
① Check ☑ and input Vid "04DA"

② Check ☑ and input Pid "160A"

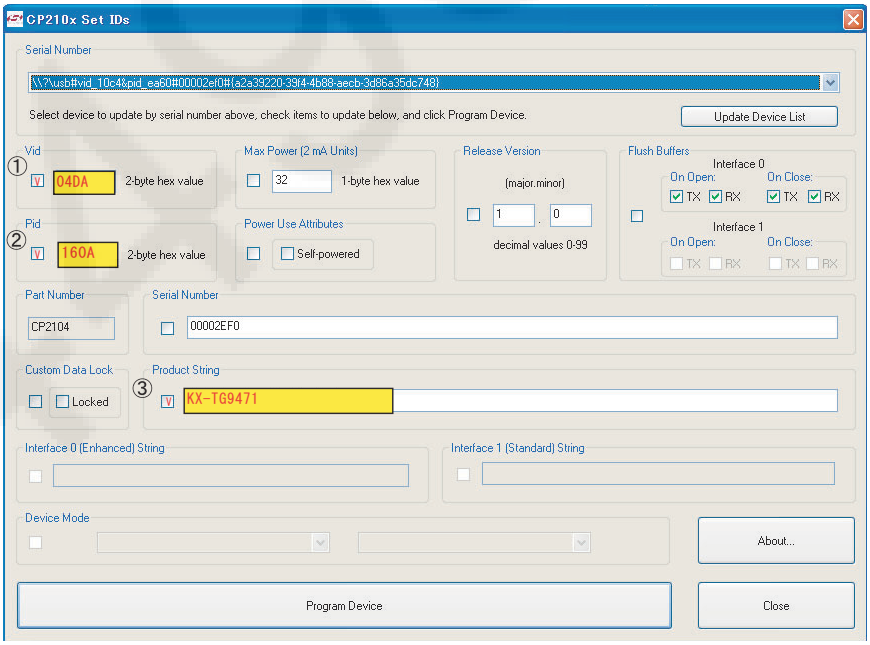
③ Check ☑ and input Product String "KX-TG9471"



(4) Click "Program Device"



(5) Disconnect USB CABLE, and then reconnect again.



11.7.3. Portable

First, operate the PC setting according to **The Setting Method of JIG (Portable)** (P.60). Then install the appropriate data according to the following procedures.

Items		Necessary Adjustment
BBIC (IC1)	Programs for Voice processing, interface for RF and EEPROM	1. Clock adjustment: Refer to Check Point (F). (*2) 2. 1.8 V setting and battery low detection: Refer to Check Point (A), (B) and (C). (*2).
EEPROM (IC3)	Adjustment parameter data is stored in memory. (country version batch file, default batch file, etc.)	
X'tal (X1)	System clock	

Note:

(*1) Refer to **Check Point (Portable)** (P.44)

11.8. RF Specification

11.8.1. Base Unit

Item	Value	Refer to -. *
TX Power	19 dBm ~ 25 dBm	**Check Point (Base Unit) (J)**
Modulation	-370±30/+370±30 kHz/div & Modulated width ≧ 690 kHz	**Check Point (Base Unit) (K)**
Frequency Offset	-50 kHz ~ +50 kHz	**Check Point (Base Unit) (L)**
Frequency Drift	< ± 35 kHz / ms	**Check Point (Base Unit) (M)**
RX Sensitivity	< 1000 ppm	**Check Point (Base Unit) (N)**
Timing Accuracy	< ± 5.0 ppm/<±15.0ppm	**Check Point (Base Unit) (O)**
Power RAMP	Power RAMP is matching	**Check Point (Base Unit) (P)**

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

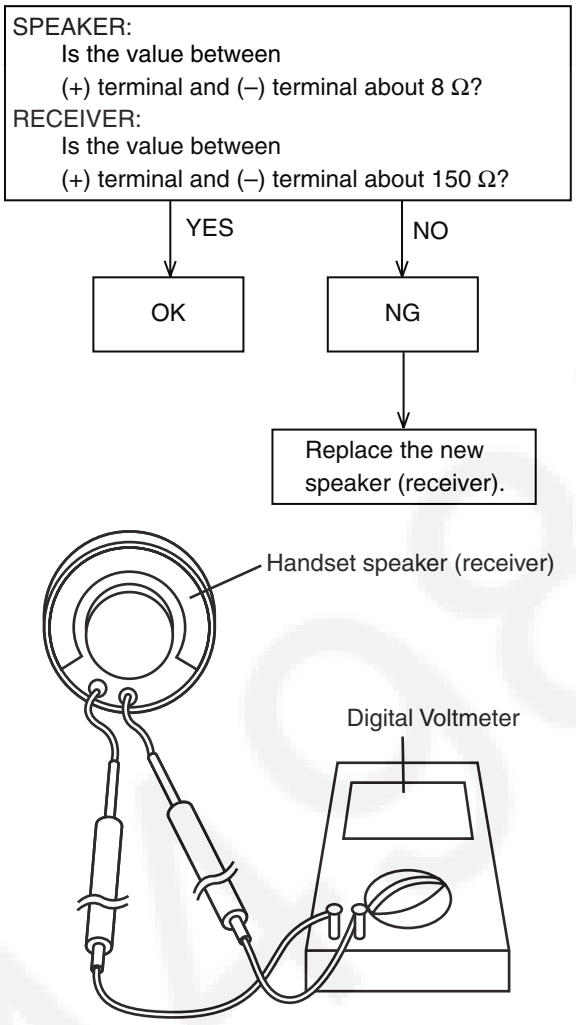
11.8.2. Portable

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

: Refer to **Check Point (Portable) (P.44)

11.9. How to Check the Portable 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)

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

12 Miscellaneous

12.1. How to Replace the Flat Package IC

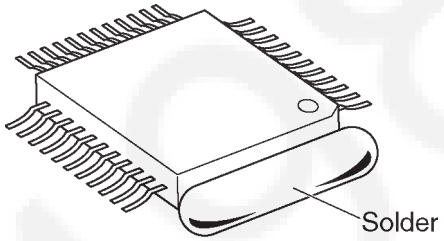
Even if you do not have the special tools (for example, a spot heater) to remove the Flat IC, with some solder (large amount), a soldering iron and a cutter knife, you can easily remove the ICs that have more than 100 pins.

12.1.1. Preparation

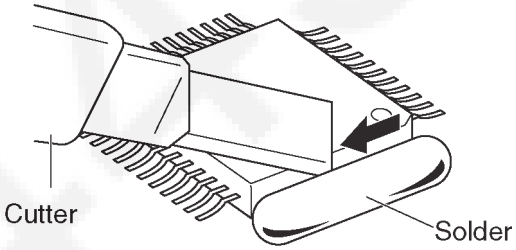
- PbF (: Pb free) Solder
- Soldering Iron
  Tip Temperature of 700 °F ± 20 °F (370 °C ± 10 °C)
  Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.
- Flux
  Recommended Flux: Specific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

12.1.2. How to Remove the IC

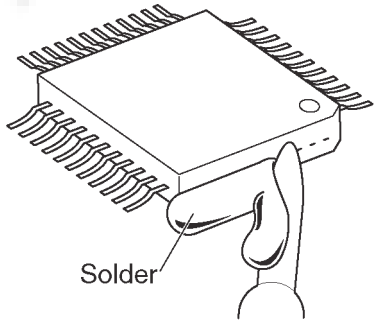
1. Put plenty of solder on the IC pins so that the pins can be completely covered.
   Note:
   If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



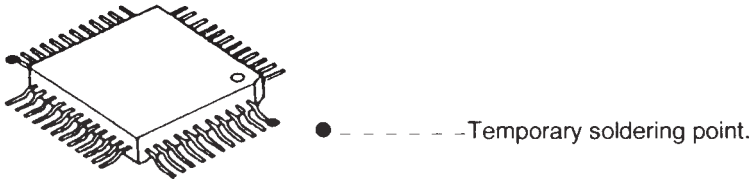
3. While the solder melts, remove it together with the IC pins.



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.

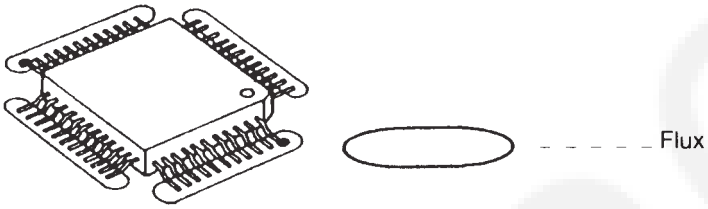
12.1.3. How to Install the IC

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

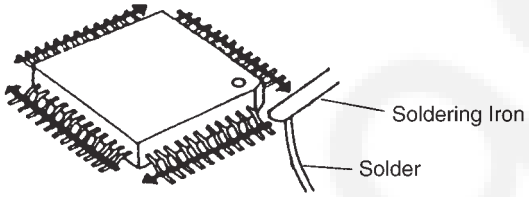


*Check the accuracy of the IC setting with the corresponding soldering foil.

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

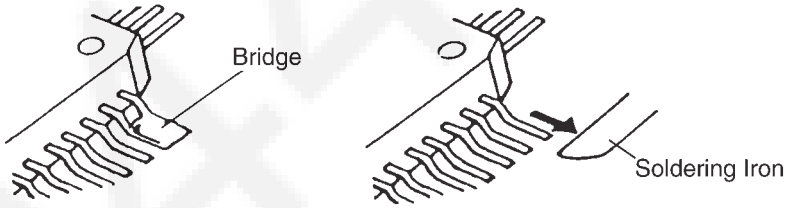


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



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 LLP (Leadless Leadframe Package) IC

12.2.1. Preparation

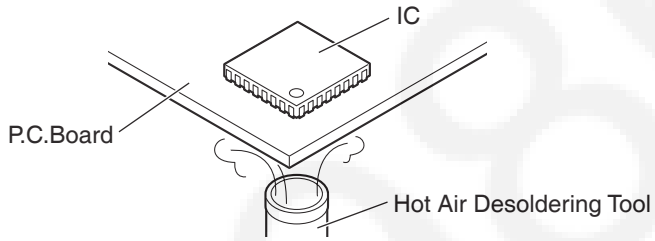
- PbF (: Pb free) Solder
- Soldering Iron
  Tip Temperature of 700 °F ± 20 °F (370 °C ± 10 °C)
  Note:
  We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.
- Hot Air Desoldering Tool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

12.2.2. Caution

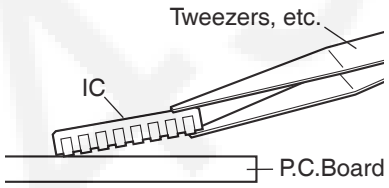
- To replace the IC efficiently, choose the right sized nozzle of the hot air desoldering tool that matches the IC package.
- Be careful about the temperature of the hot air desoldering tool not to damage the PCB and/or IC.

12.2.3. How to Remove the IC

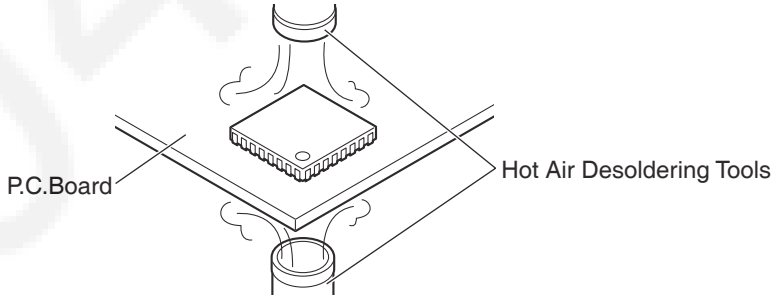
1. Heat the IC with a hot air desoldering tool through the P.C.Board.



2. Pick up the IC with tweezers, etc. when the solder is melted completely.
   Note:
   - Be careful not to touch the peripheral parts with tweezers, etc. They are unstable.



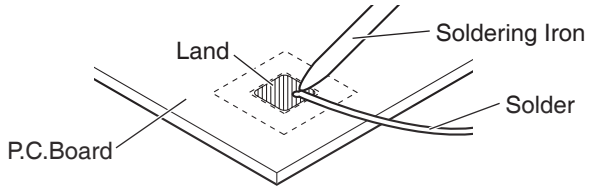
When it is hard to melt the solder completely, heat it with a hot air desoldering tool through the IC besides through the P.C.Board.



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

12.2.4. How to Install the IC

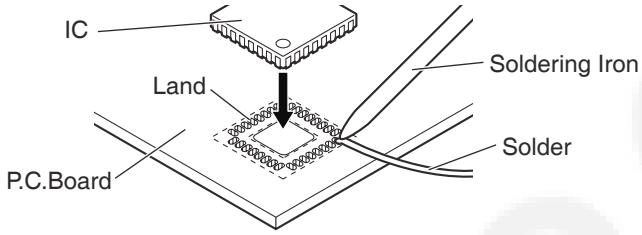
1. Place the solder a little on the land where the radiation GND pad on IC bottom is to be attached.



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

Note:

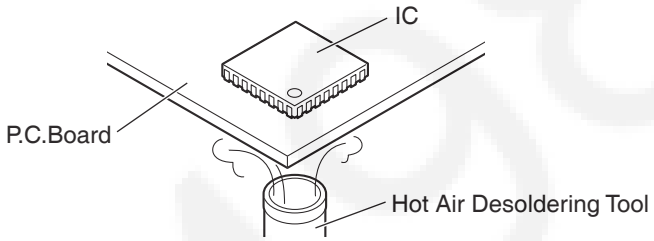
• When placing the IC, the positioning should be done very carefully.



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

Note:

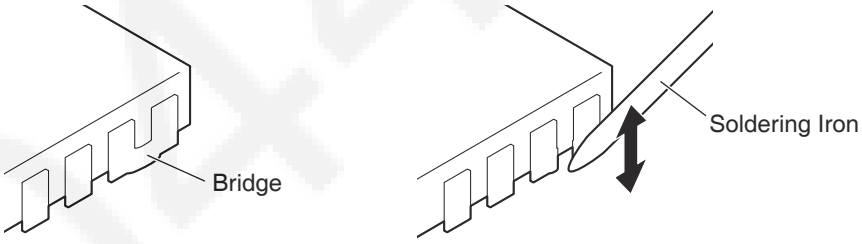
• Be sure to place it precisely, controlling the air volume of the hot air desoldering tool.



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

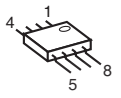
12.2.5. How to Remove a Solder Bridge

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



12.3. Terminal Guide of the ICs, Transistors and Diodes

12.3.1. Base Unit



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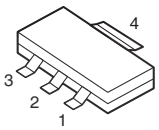
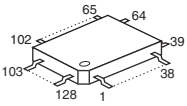
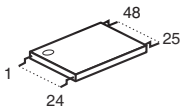
C3FBMY000286



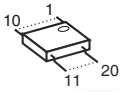
C0DBEYY00102



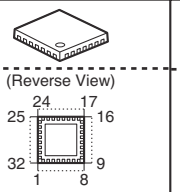
C1CB00002704



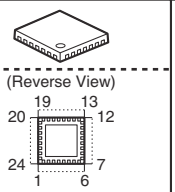
PNWI2TG9471H



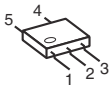
C0JBAF000223



C1CB00002427



C1CB00003661



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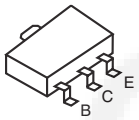
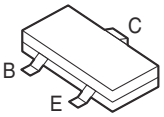


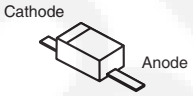
B1ADGP000008
DSC7003S0L

B0EDER000009

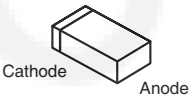


UN5113, B1ADGE000012
B1ABDF000017, DSA2001R0L
PQVTDTC143E, UN5213, B0DDCD000001

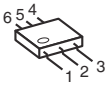
PQVDPTZT2530



B0JCDD000002
1SS355



MAZ805100L



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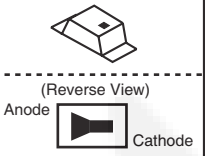
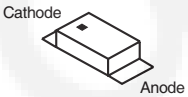
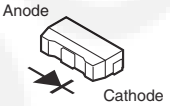


B3ABB0000331

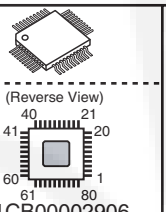


LNJ826W83RA

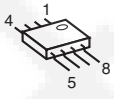


B3AFB0000211

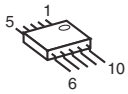
12.3.2. Portable



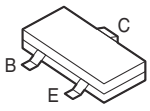
C1CB00002906



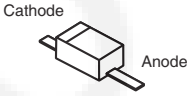
PNWITG939TR



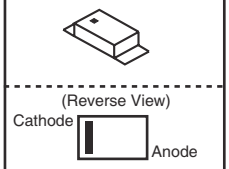
C1CB00001842



B1ADGE000004, UN9219J, 2SC6054JSL
B1ABDF000026, B0DDCL000001

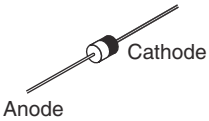


B0JCMC000006, 1SS355, B0JCME000035
MA8043M, MA27P1200L



B3ACB0000216

12.3.3. Charger



B0JAME000095

13 Schematic Diagram

13.1. For Schematic Diagram

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

Notes:

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

> Important Safety Notice:
> Components identified by ⚠ 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. Portable (Schematic Diagram (Portable))

Notes:

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

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

Notes:

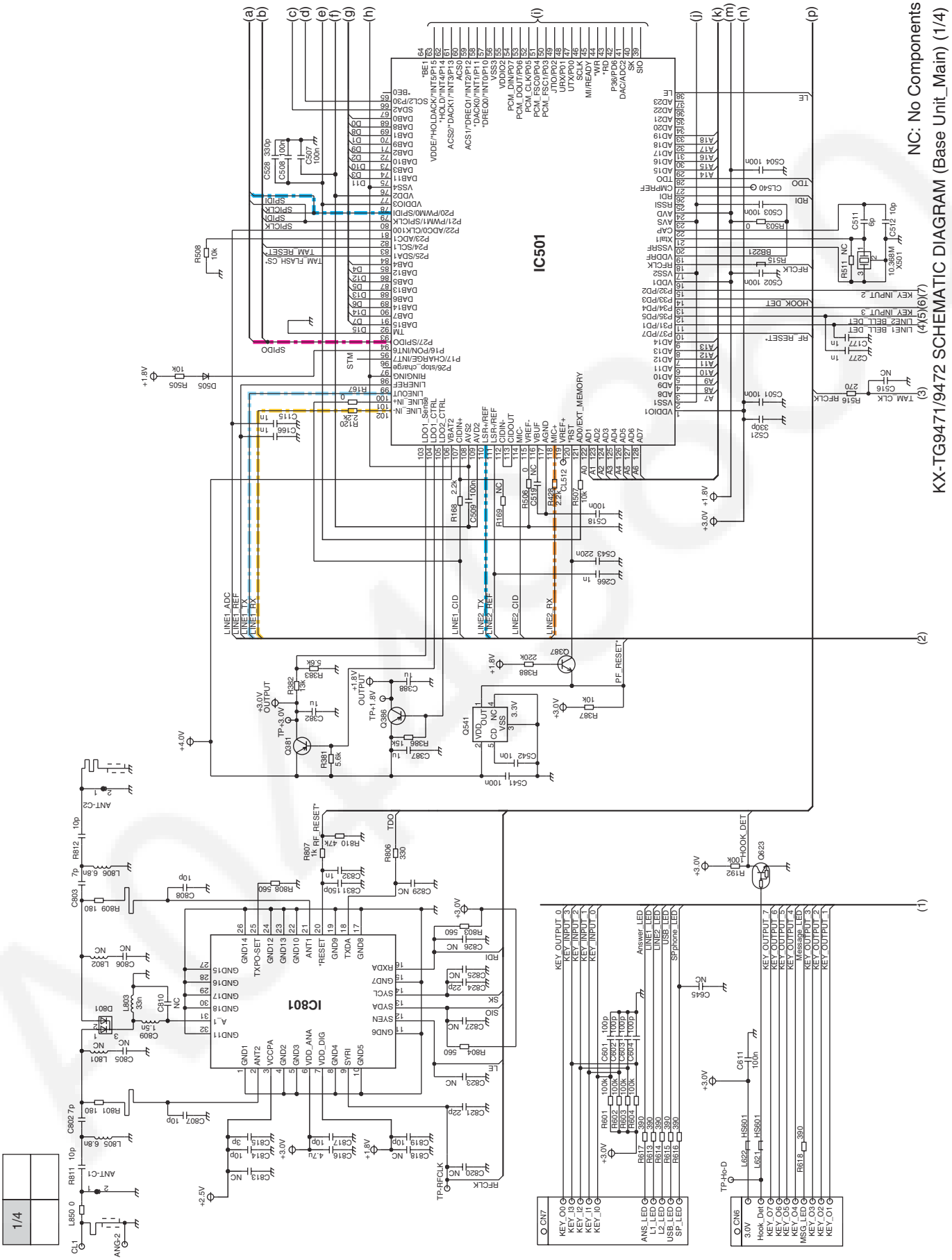
1. DC voltage measurements are taken with voltmeter from the negative voltage line.

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

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

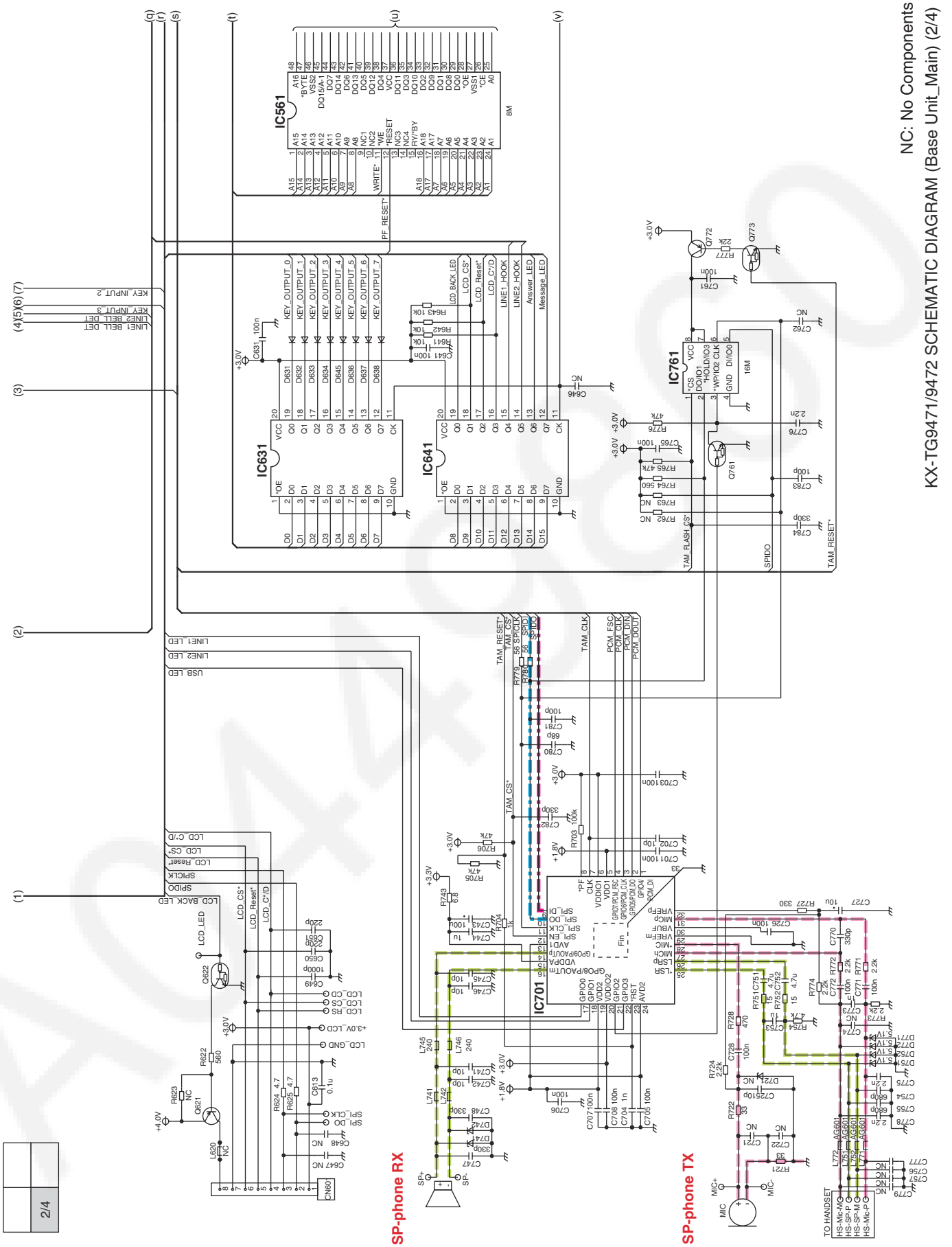
Memo

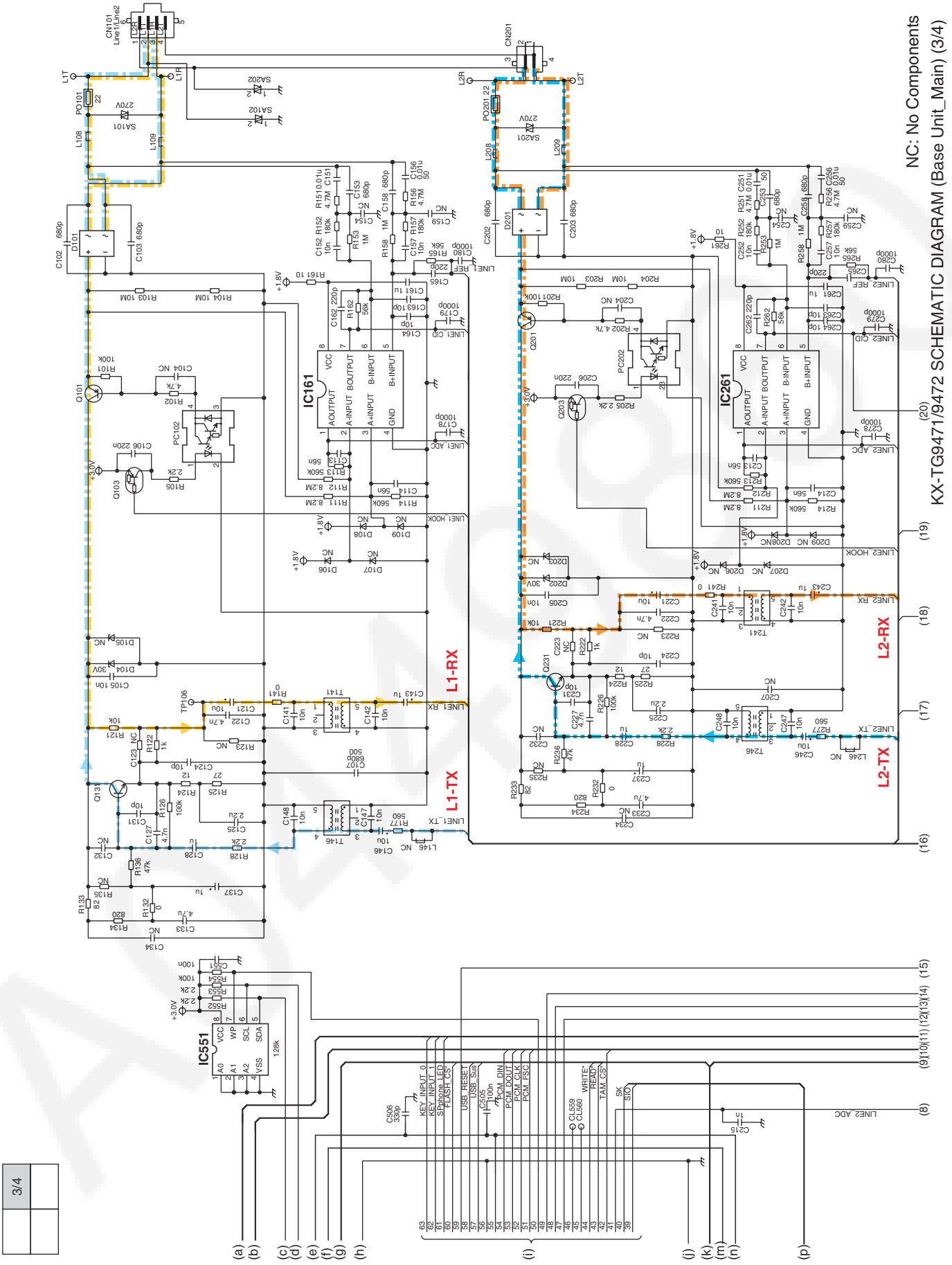
13.2. Schematic Diagram (Base Unit_Main)



NC: No Components

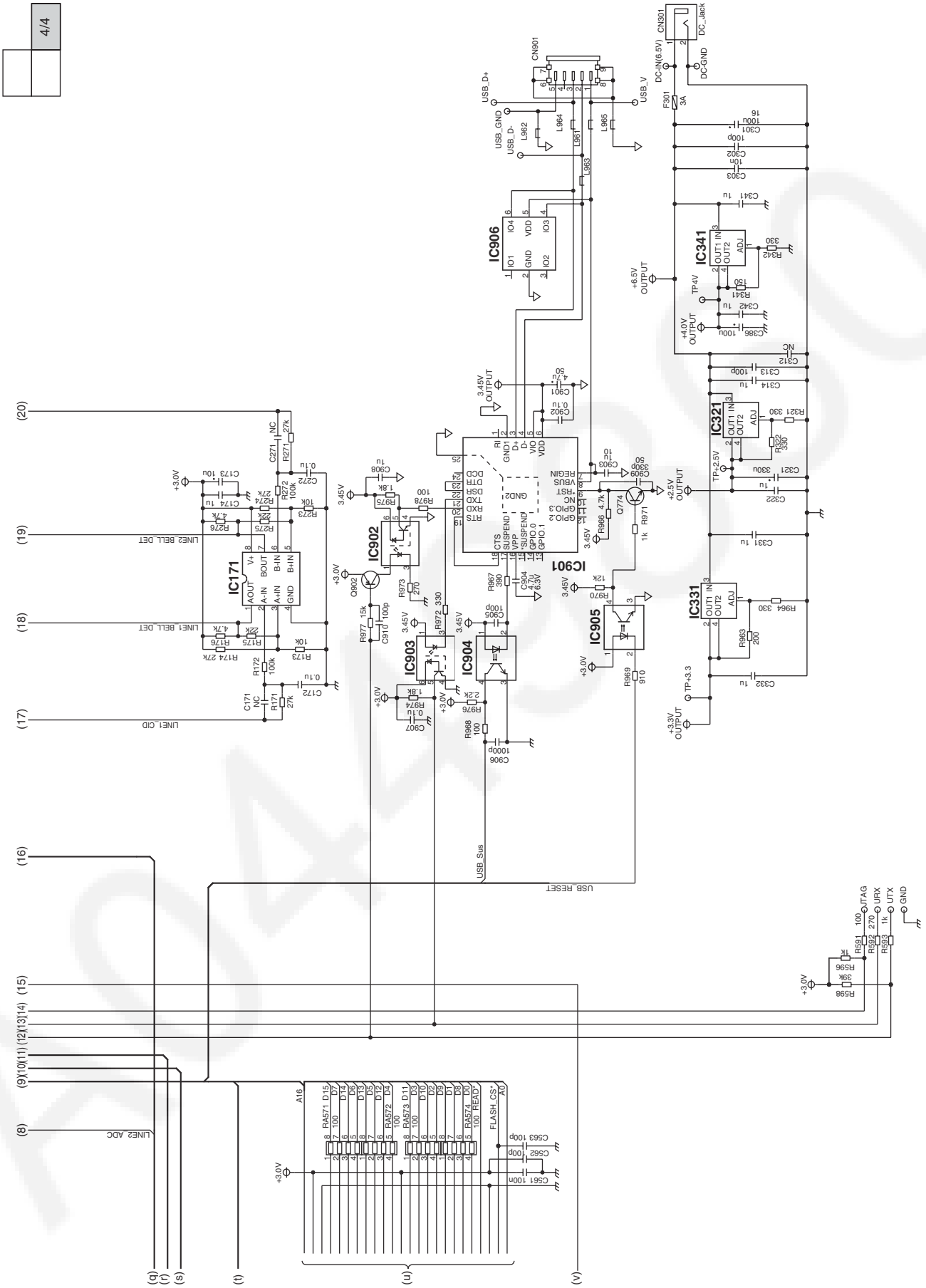
KX-TG9471/9472 SCHEMATIC DIAGRAM (Base Unit_Main) (2/4)



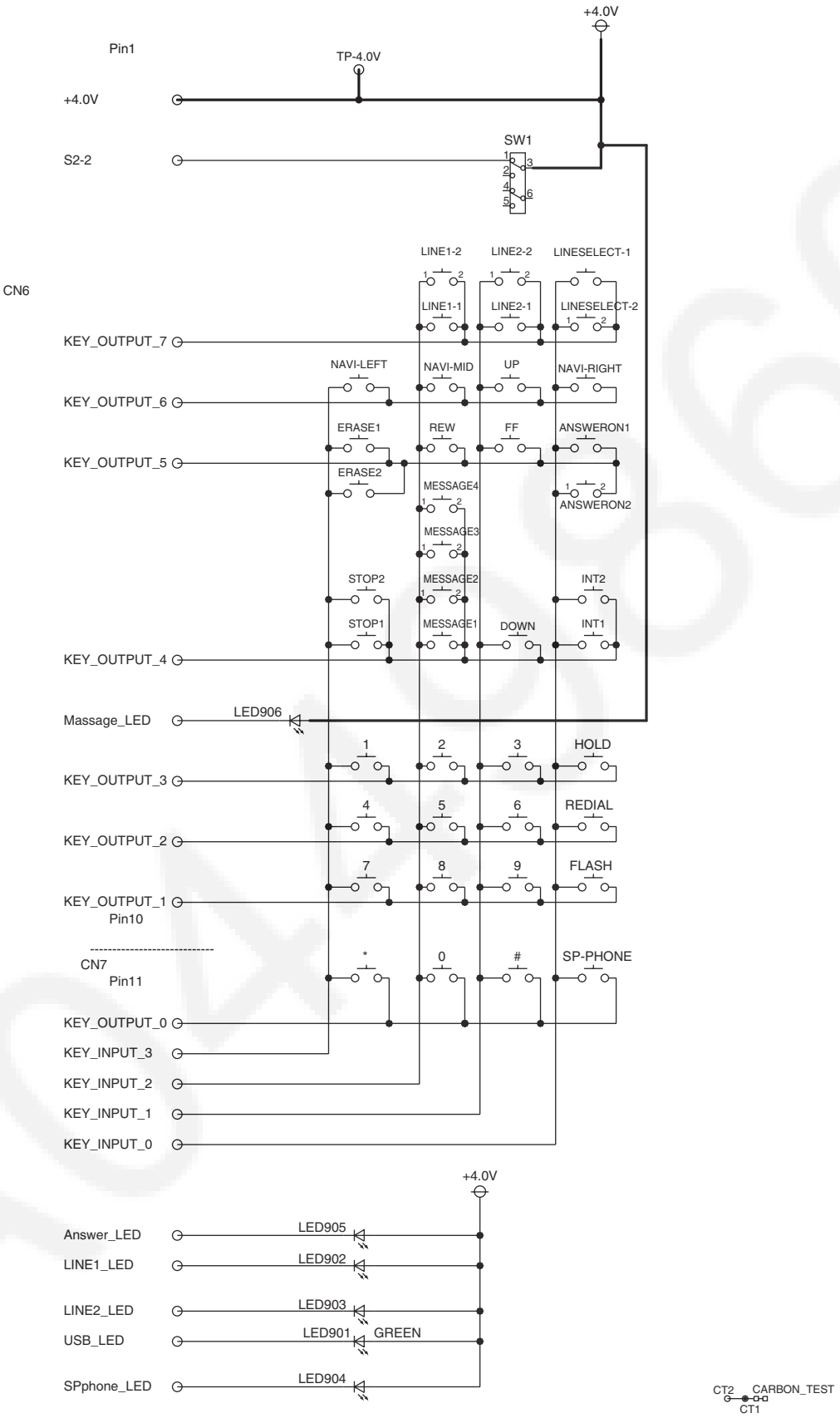

KX-TG9471/9472 SCHEMATIC DIAGRAM (Base Unit_Main) (3/4)
NC: No Components
L1-RX
L1-TX
L2-RX
L2-TX
IC161
IC261
IC551
3/4

NC: No Components

KX-TG9471/9472 SCHEMATIC DIAGRAM (Base Unit_Main) (4/4)



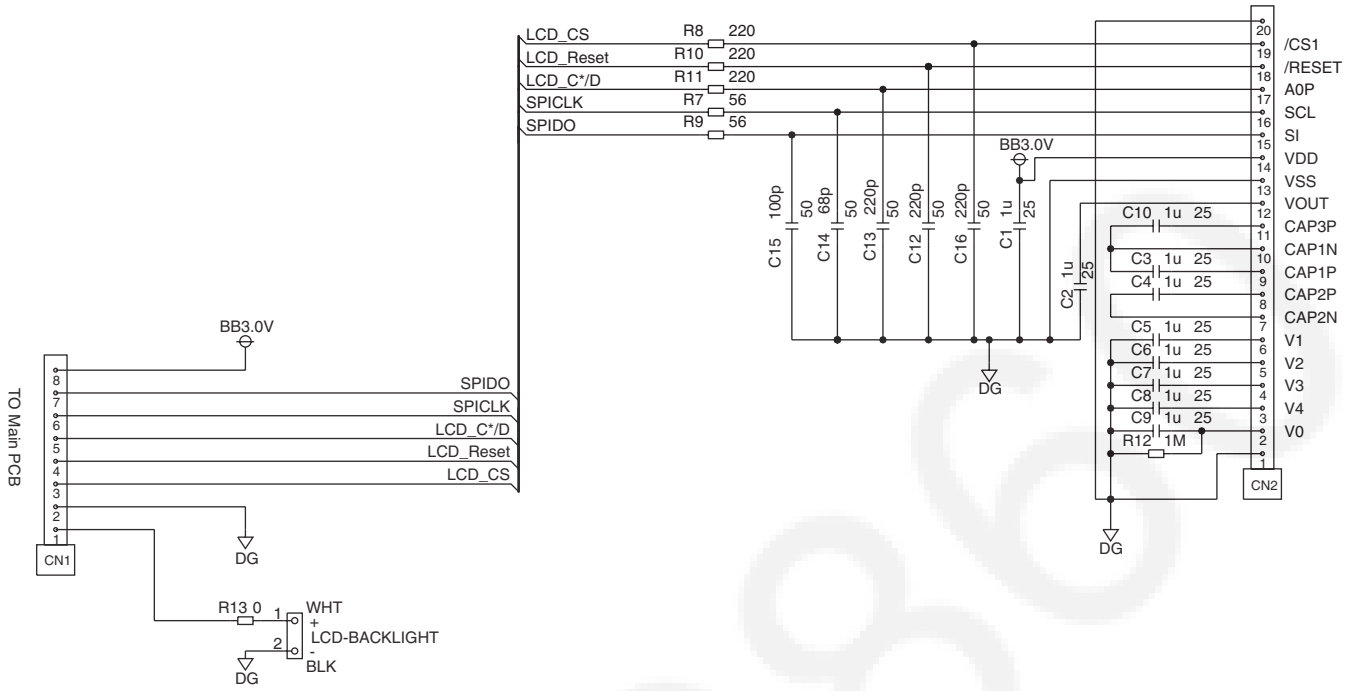
13.3. Schematic Diagram (Base Unit_Operation)



NC: No Components

KX-TG9471/9472 SCHEMATIC DIAGRAM (Base Unit_Operation)

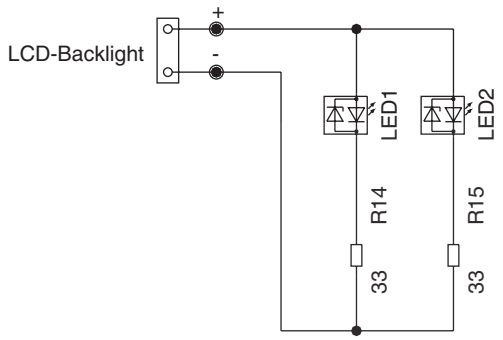
13.4. Schematic Diagram (Base Unit_LCD)



NC: No Components

KX-TG9471/9472 SCHEMATIC DIAGRAM (Base Unit_LCD)

13.5. Schematic Diagram (Base Unit_LED)

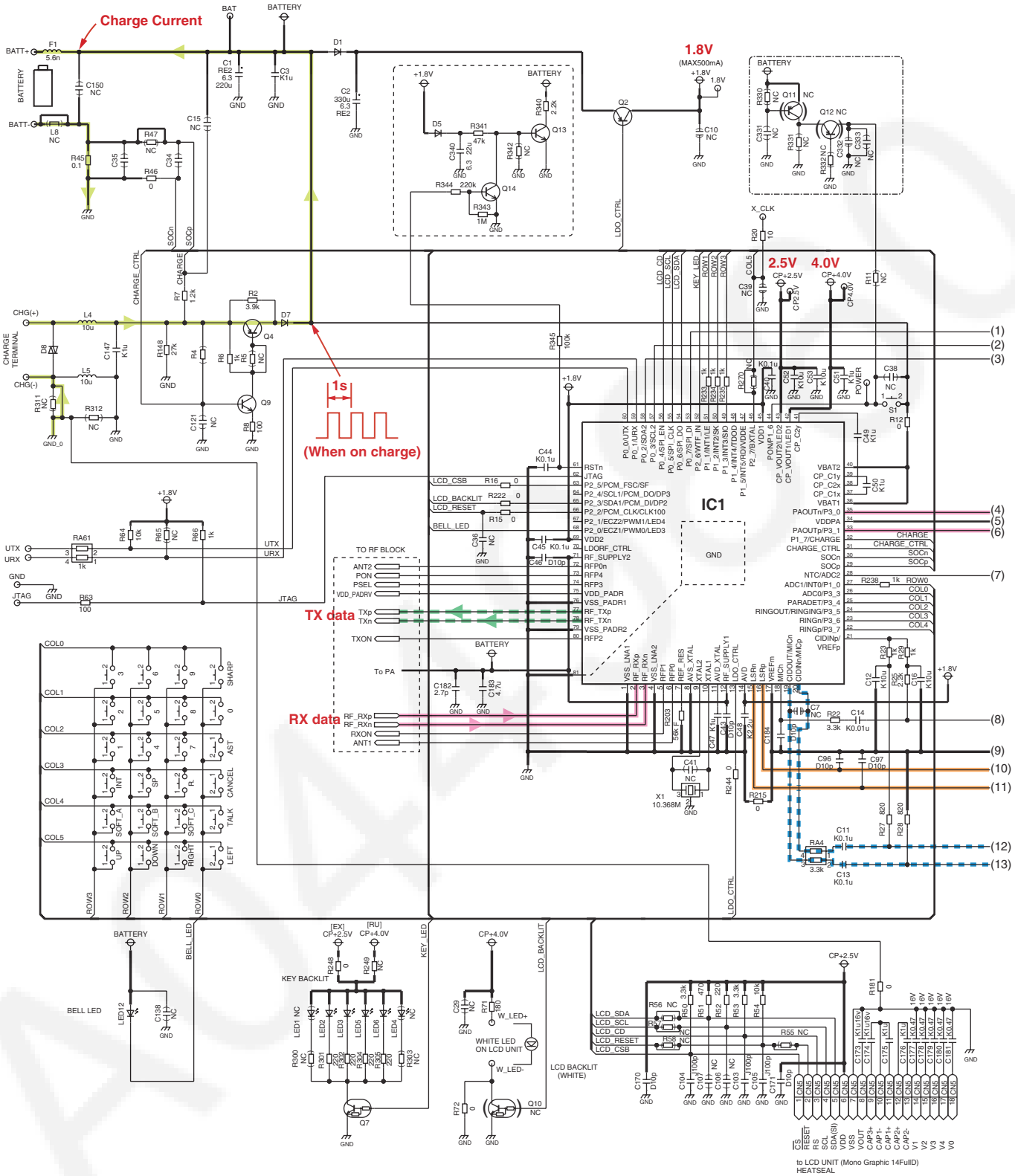


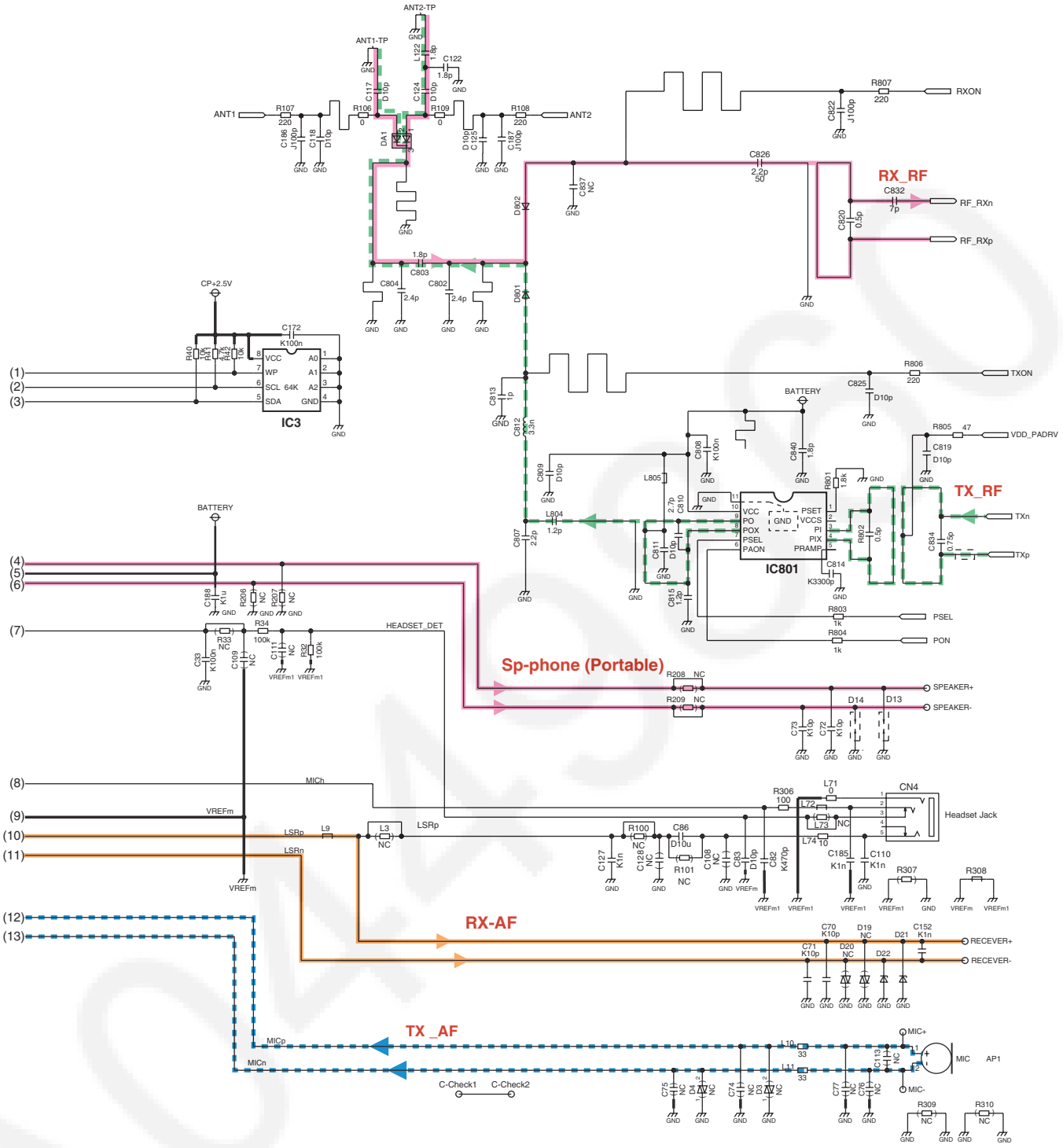
NC: No Components

KX-TG9471/9472 SCHEMATIC DIAGRAM (Base Unit_LED)

Memo

13.6. Schematic Diagram (Portable)

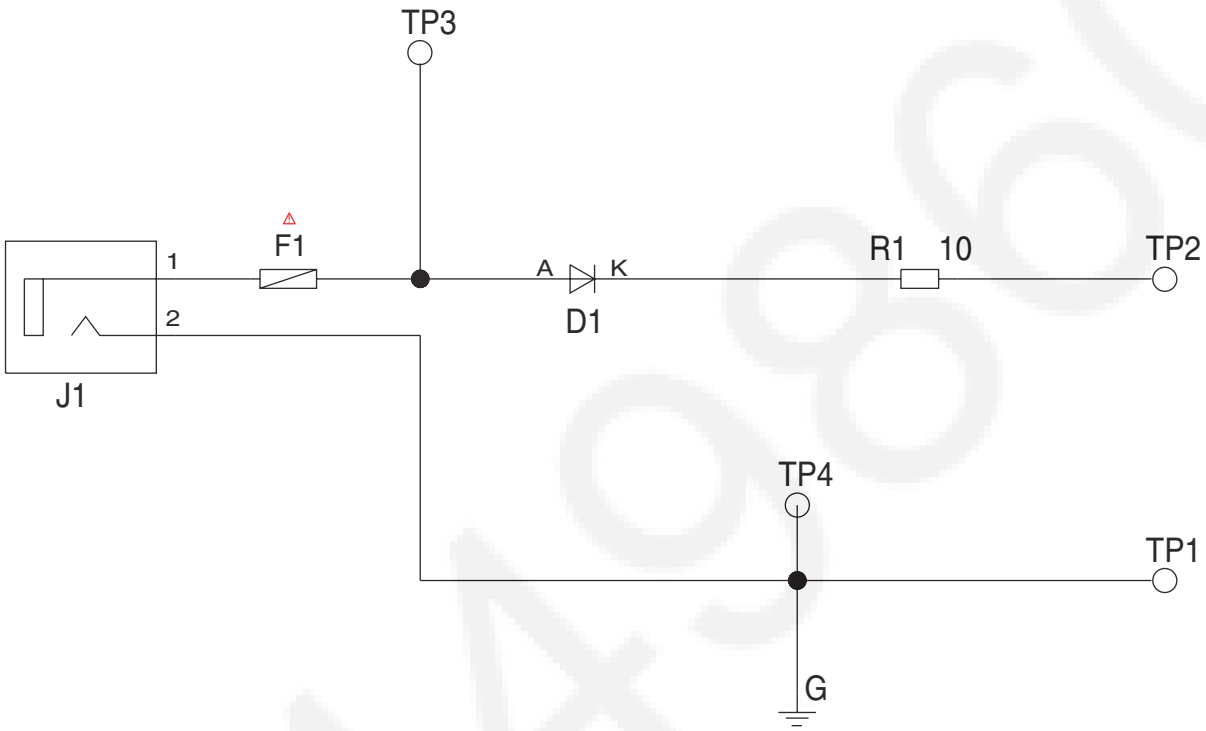




NC: No Components

KX-TGA939 SCHEMATIC DIAGRAM (Portable_Main)

13.7. Schematic Diagram (Charger Unit)

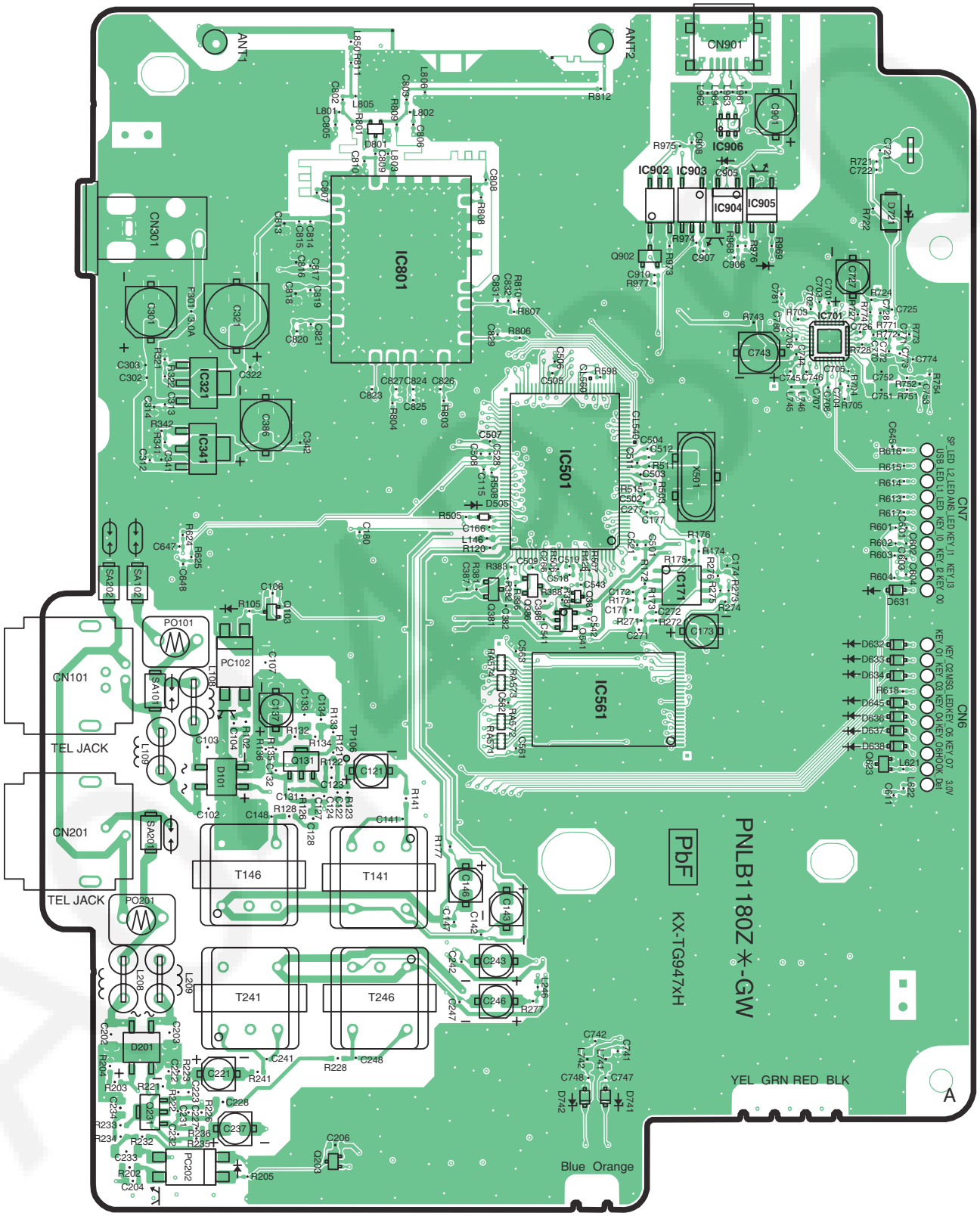


SCHEMATIC DIAGRAM (Charger Unit)

14 Printed Circuit Board

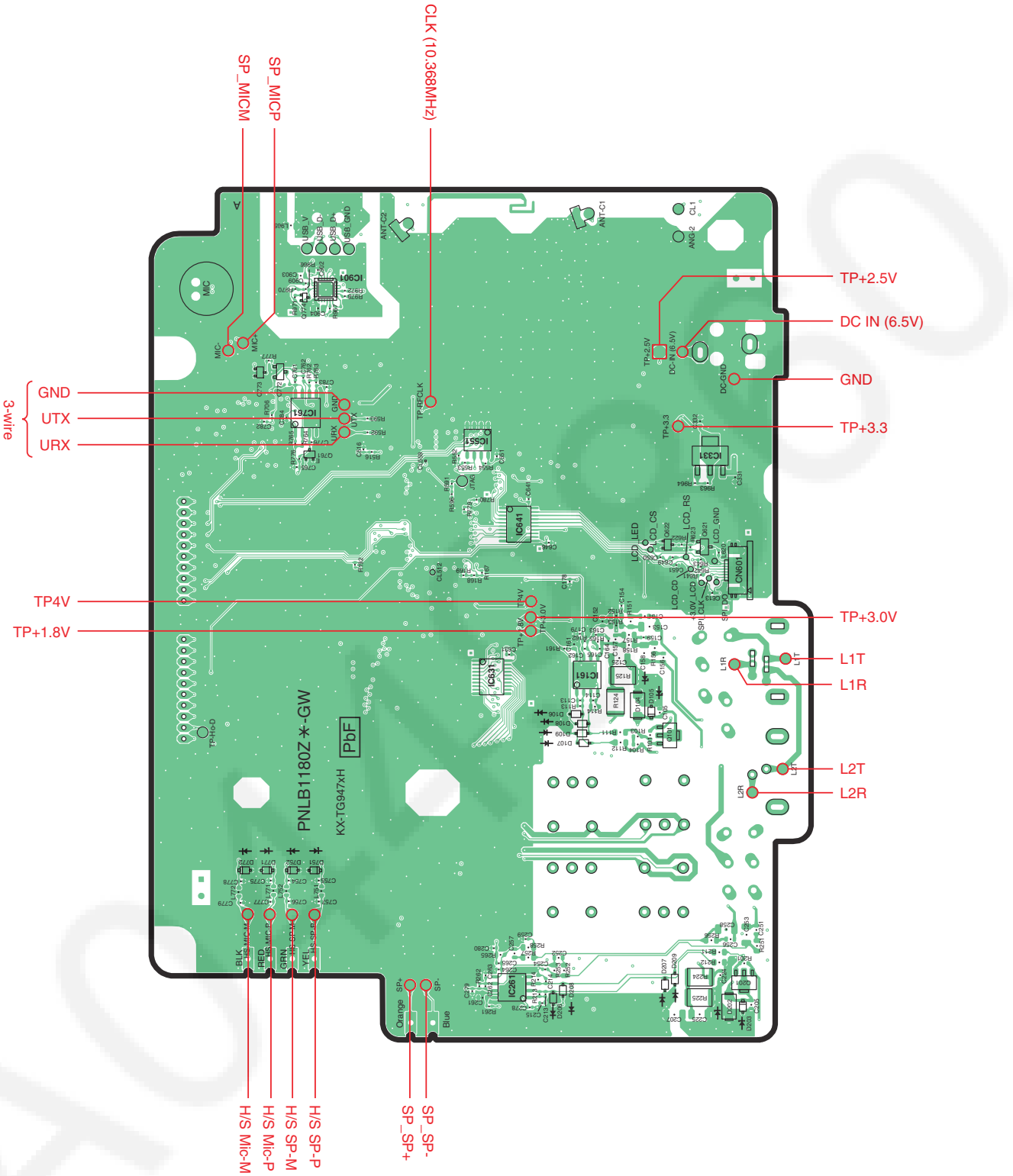
14.1. Circuit Board (Base Unit_Main)

14.1.1. Component View



KX-TG9471/9472 CIRCUIT BOARD (Base Unit_Main (Component View))

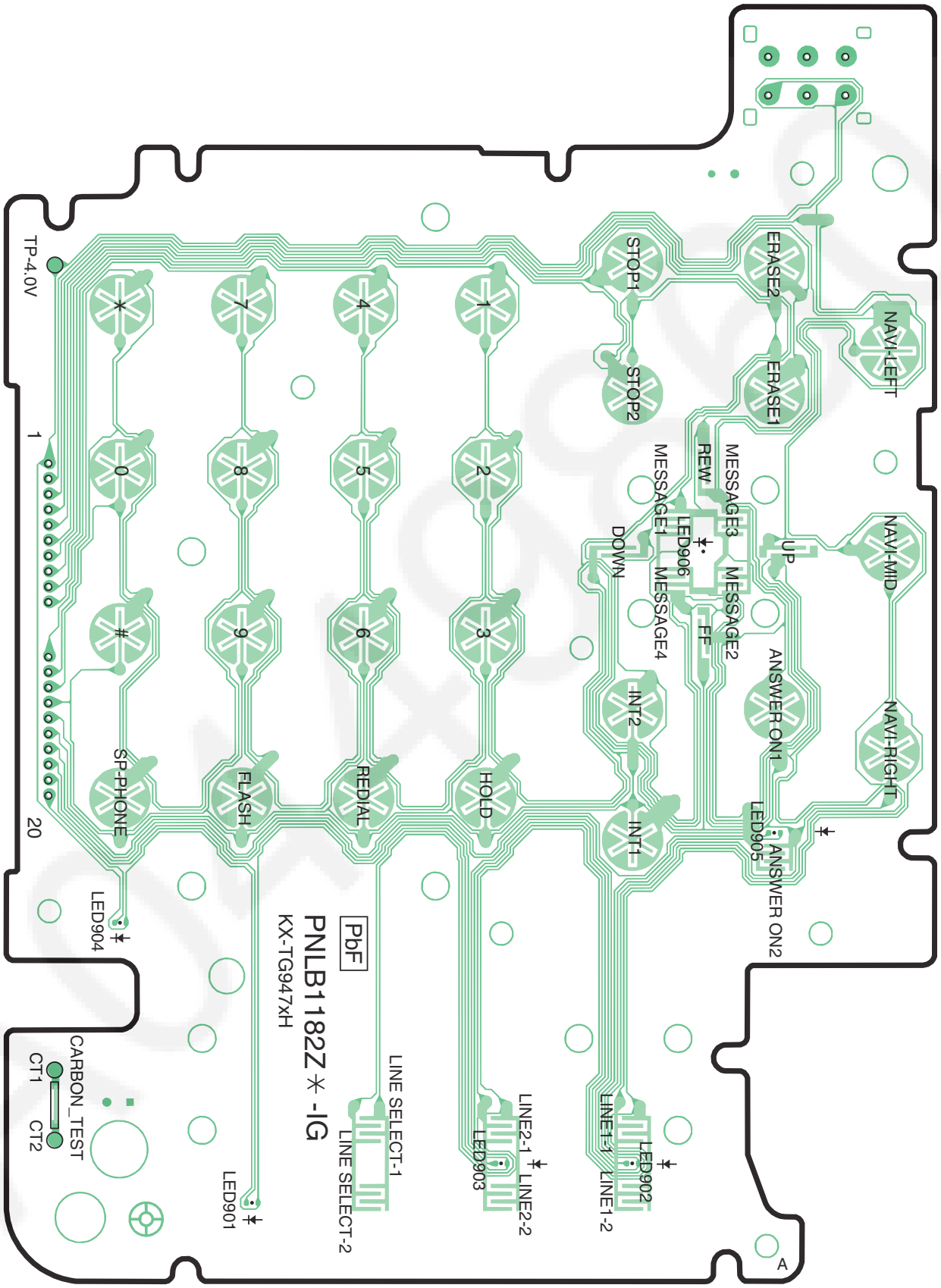
14.1.2. Bottom View



KX-TG9471/9472 CIRCUIT BOARD (Base Unit_Main (Bottom View))

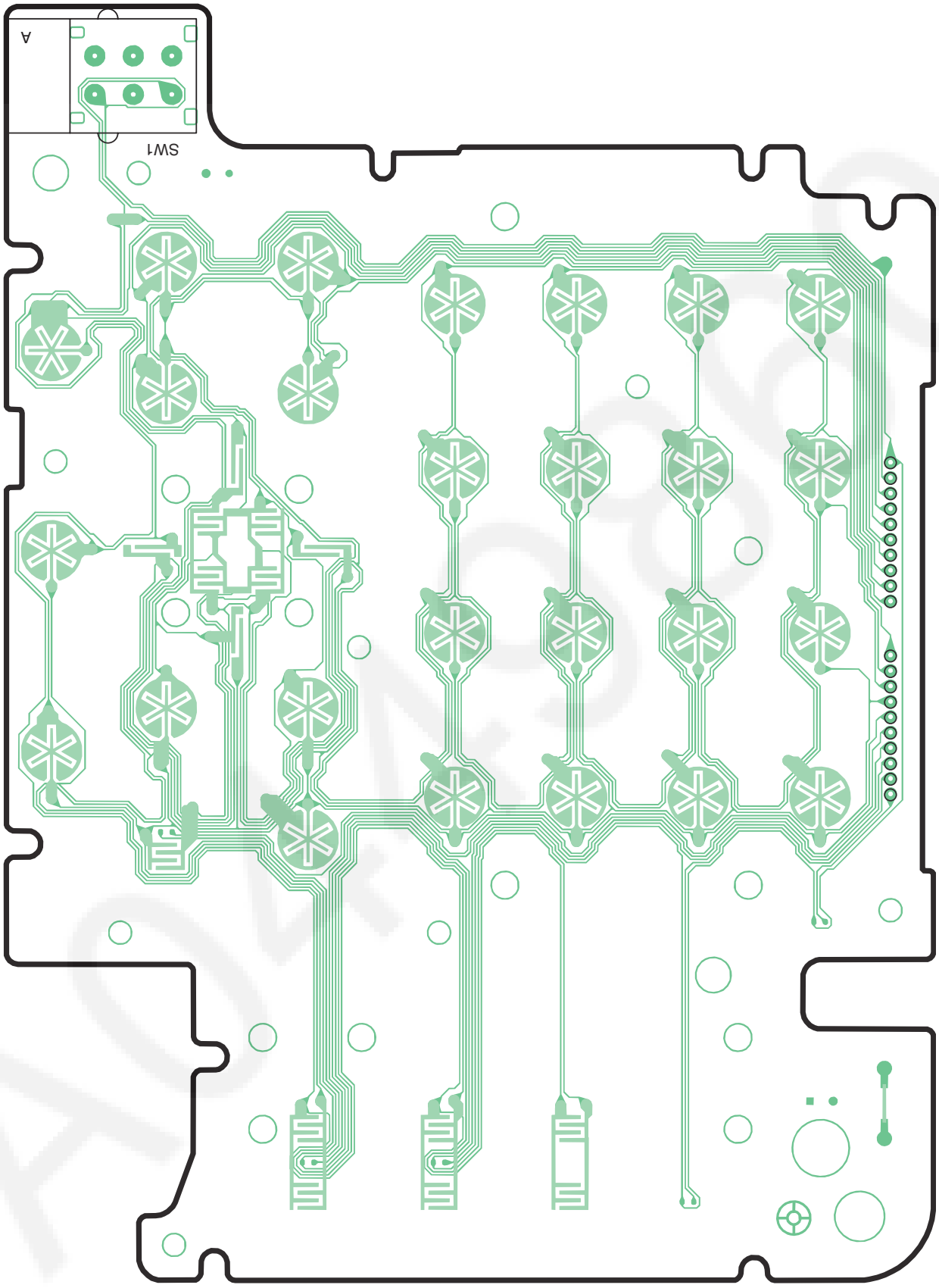
14.2. Circuit Board (Base Unit_Operation)

14.2.1. Component View



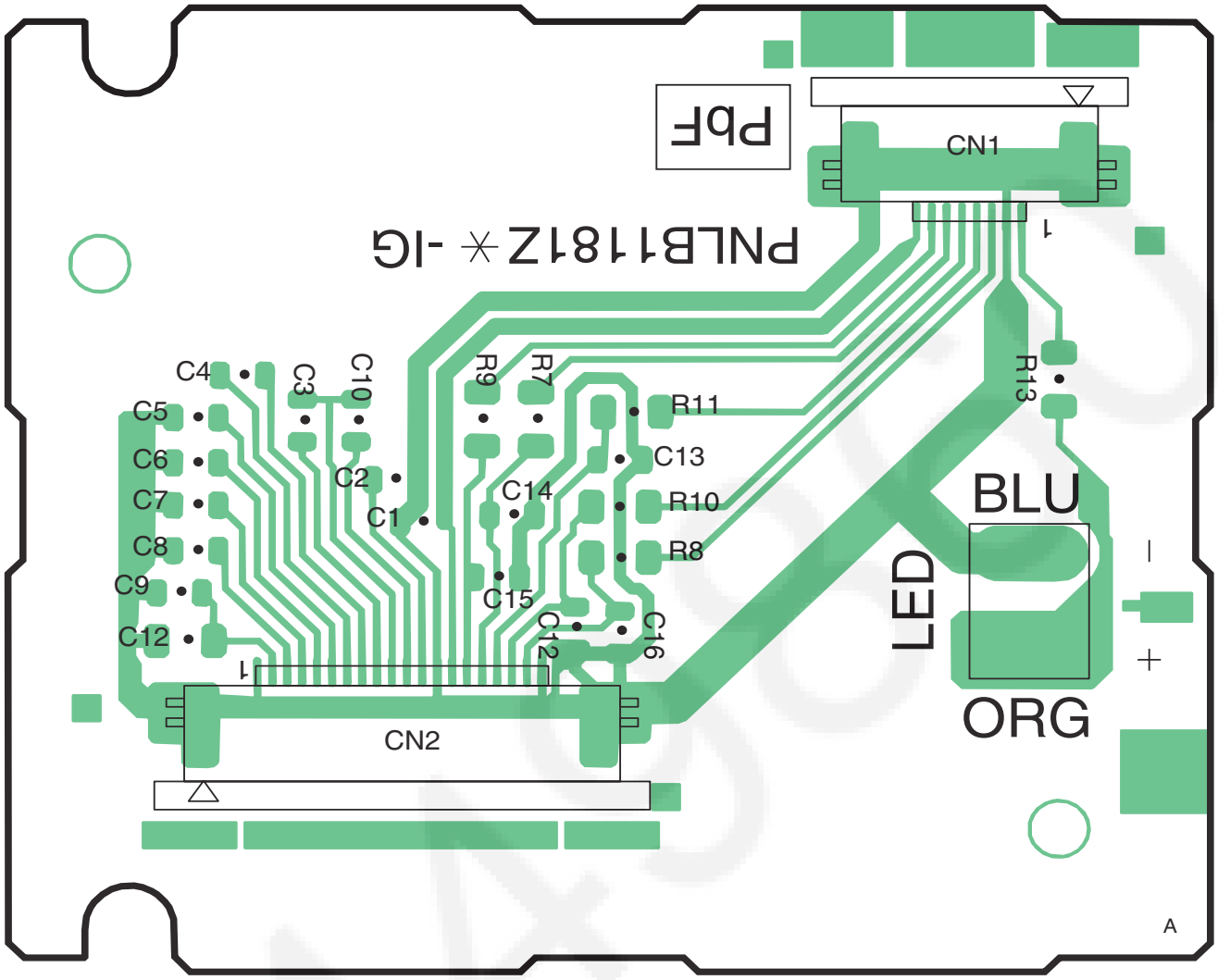
KX-TG9471/9472 CIRCUIT BOARD (Base Unit_Operation (Component View))

14.2.2. Bottom View



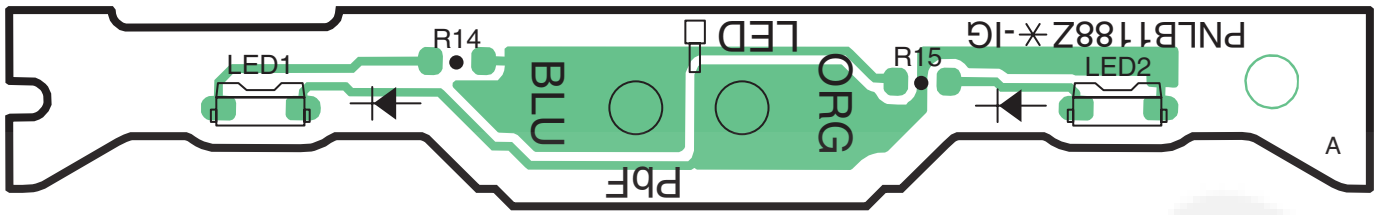
KX-TG9471/9472 CIRCUIT BOARD (Base Unit_Operation (Bottom View))

14.3. Circuit Board (Base Unit_LCD)



KX-TG9471/9472 CIRCUIT BOARD (Base Unit_LCD (Component View))

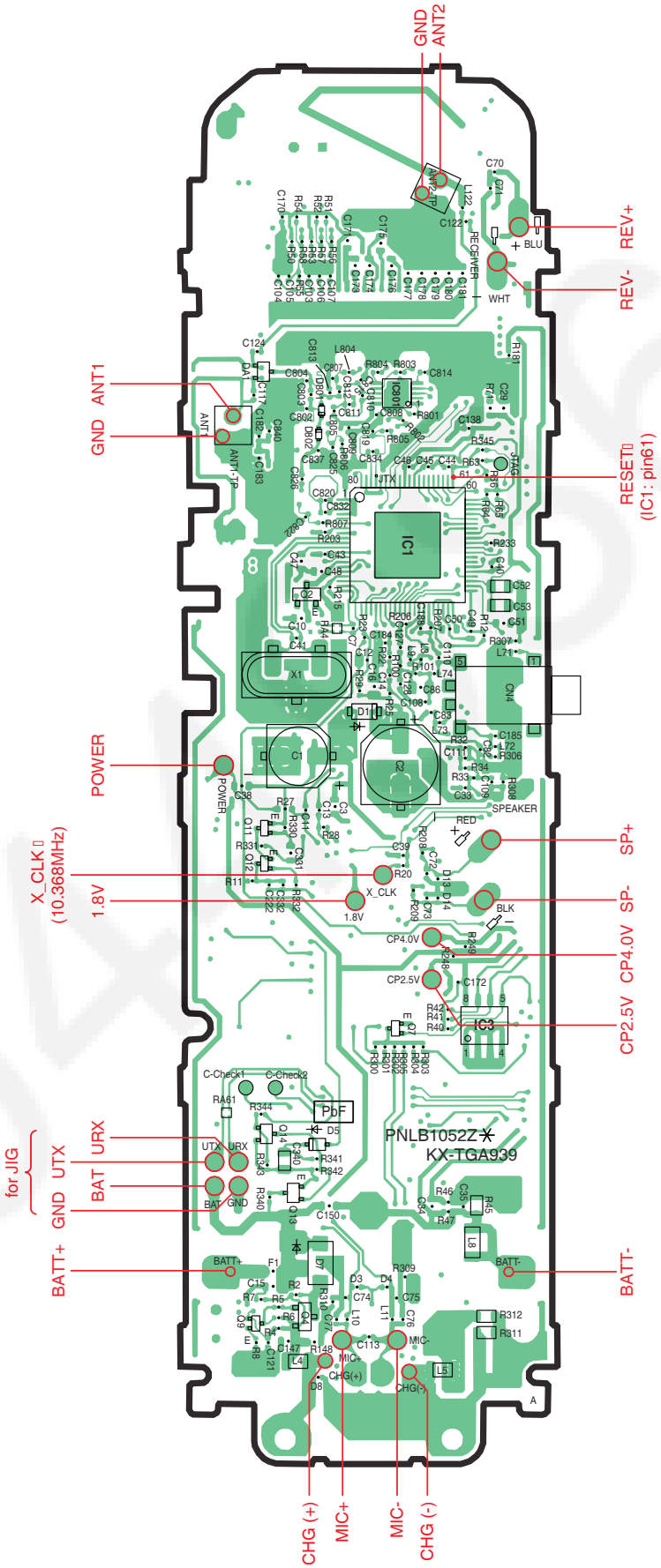
14.4. Circuit Board (Base Unit_LED)



KX-TG9471/9472 CIRCUIT BOARD (Base Unit_LED (Component View))

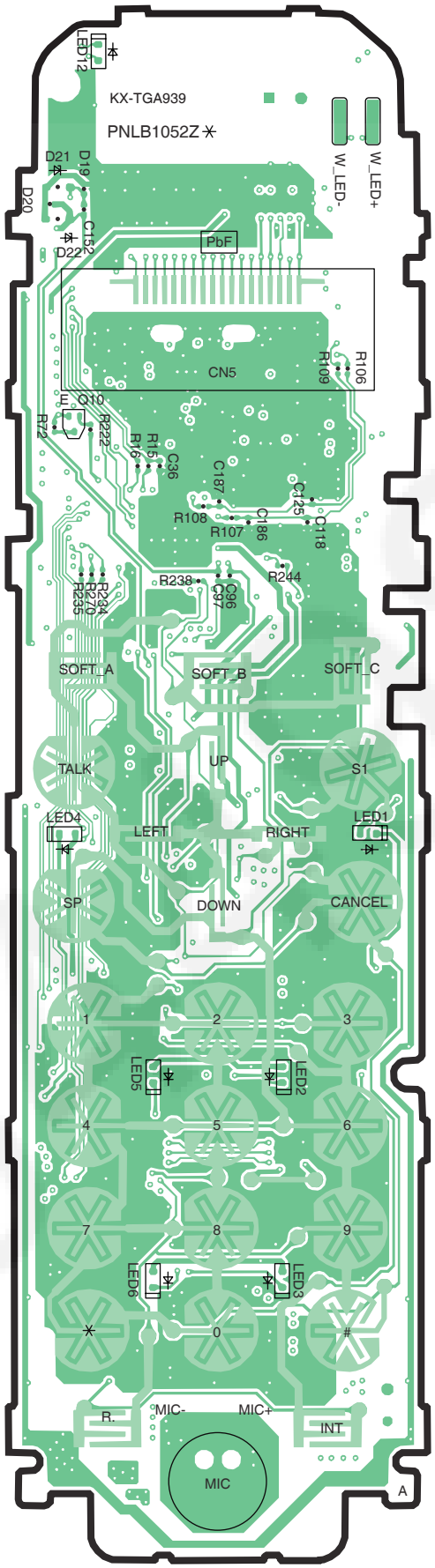
14.5. Circuit Board (Portable)

14.5.1. Component View



KX-TGA939 CIRCUIT BOARD (Portable_Main (Component View))

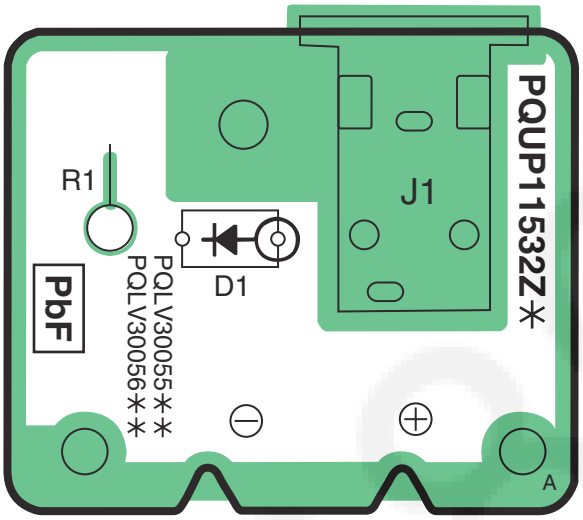
14.5.2. Bottom View



KX-TGA939 CIRCUIT BOARD (Portable_Main (Bottom View))

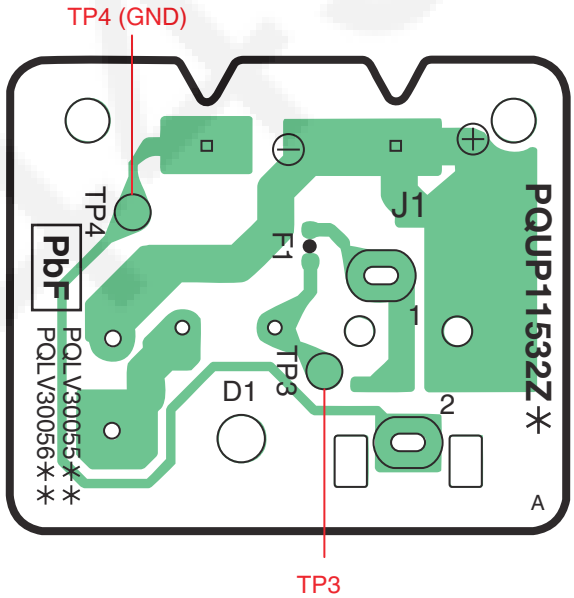
14.6. Circuit Board (Charger Unit)

14.6.1. Component View



CIRCUIT BOARD (Charger unit (Component View))

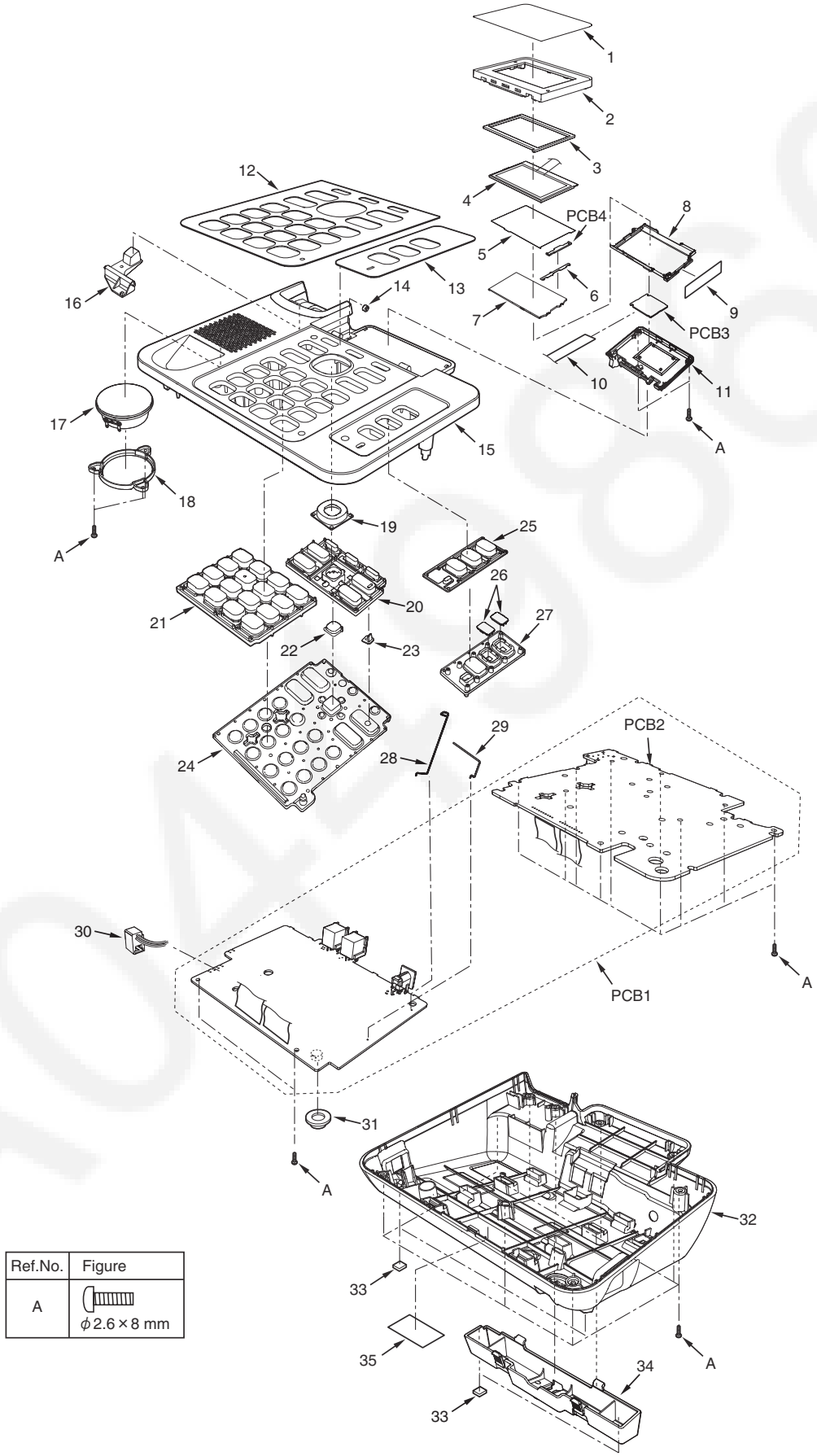
14.6.2. Bottom View



CIRCUIT BOARD (Charger unit (Bottom View))

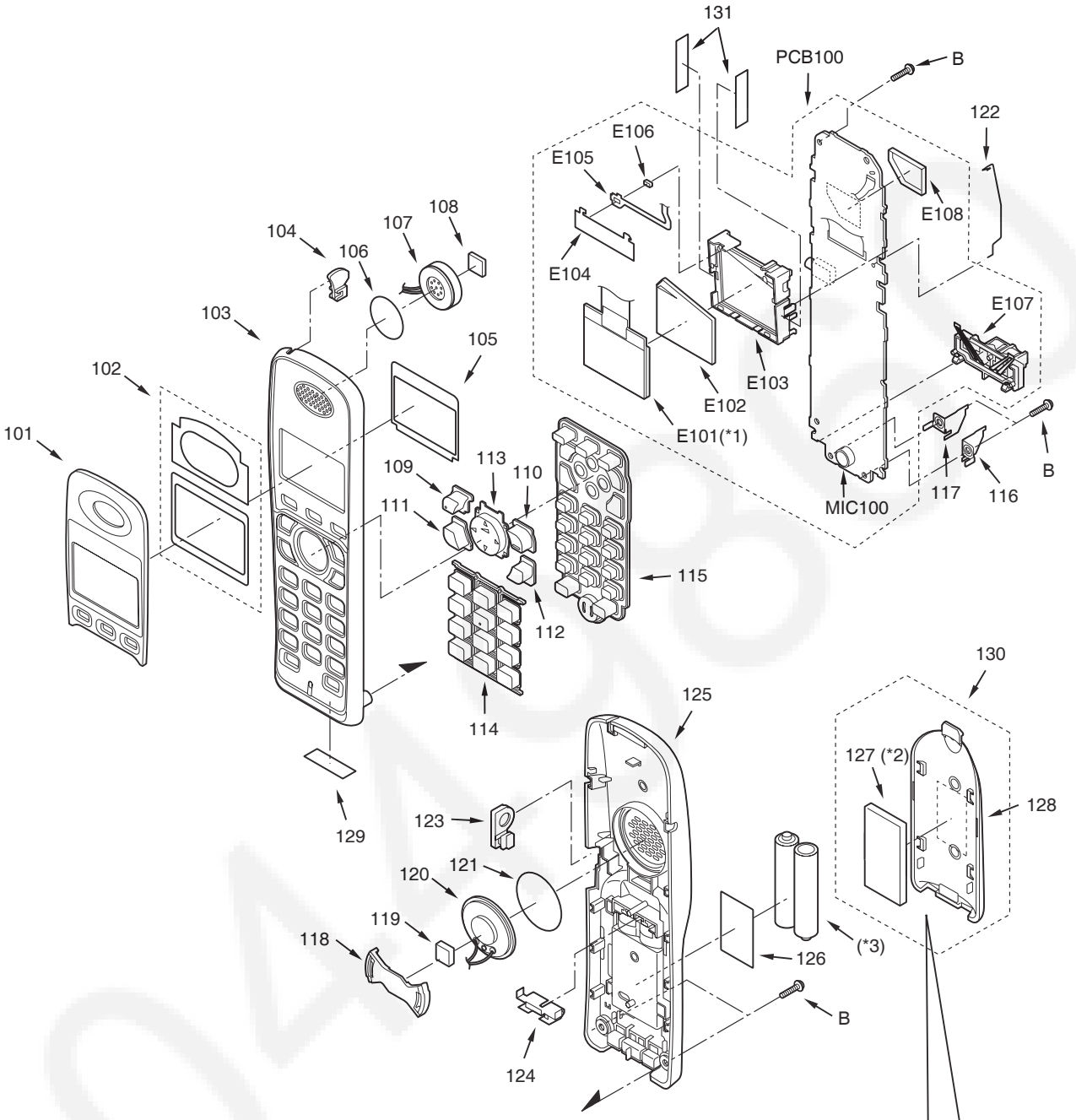
15 Exploded View and Replacement Parts List

15.1. Cabinet and Electrical Parts (Base Unit)



Ref.No.	Figure
A	ϕ2.6 × 8 mm

15.2. Cabinet and Electrical Parts (Portable)



Ref.No.	Figure
B	ϕ2 × 8 mm

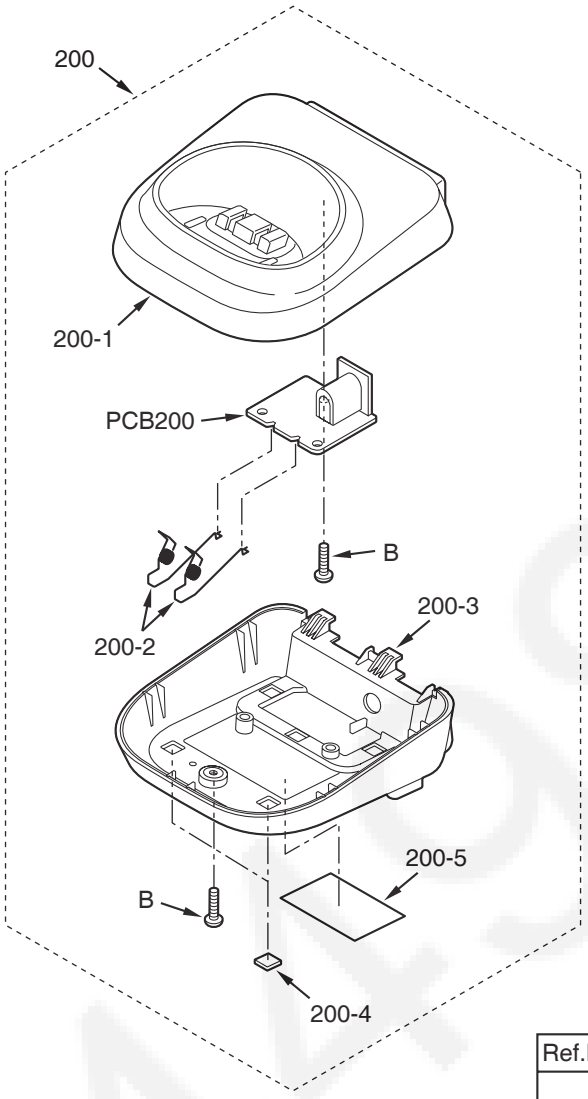
Note:

(*1) This cable is fixed by soldering. Refer to **How to Replace the Portable LCD** (P.55).

(*2) Attach the spacer (No. 127) to the exact location described above.

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

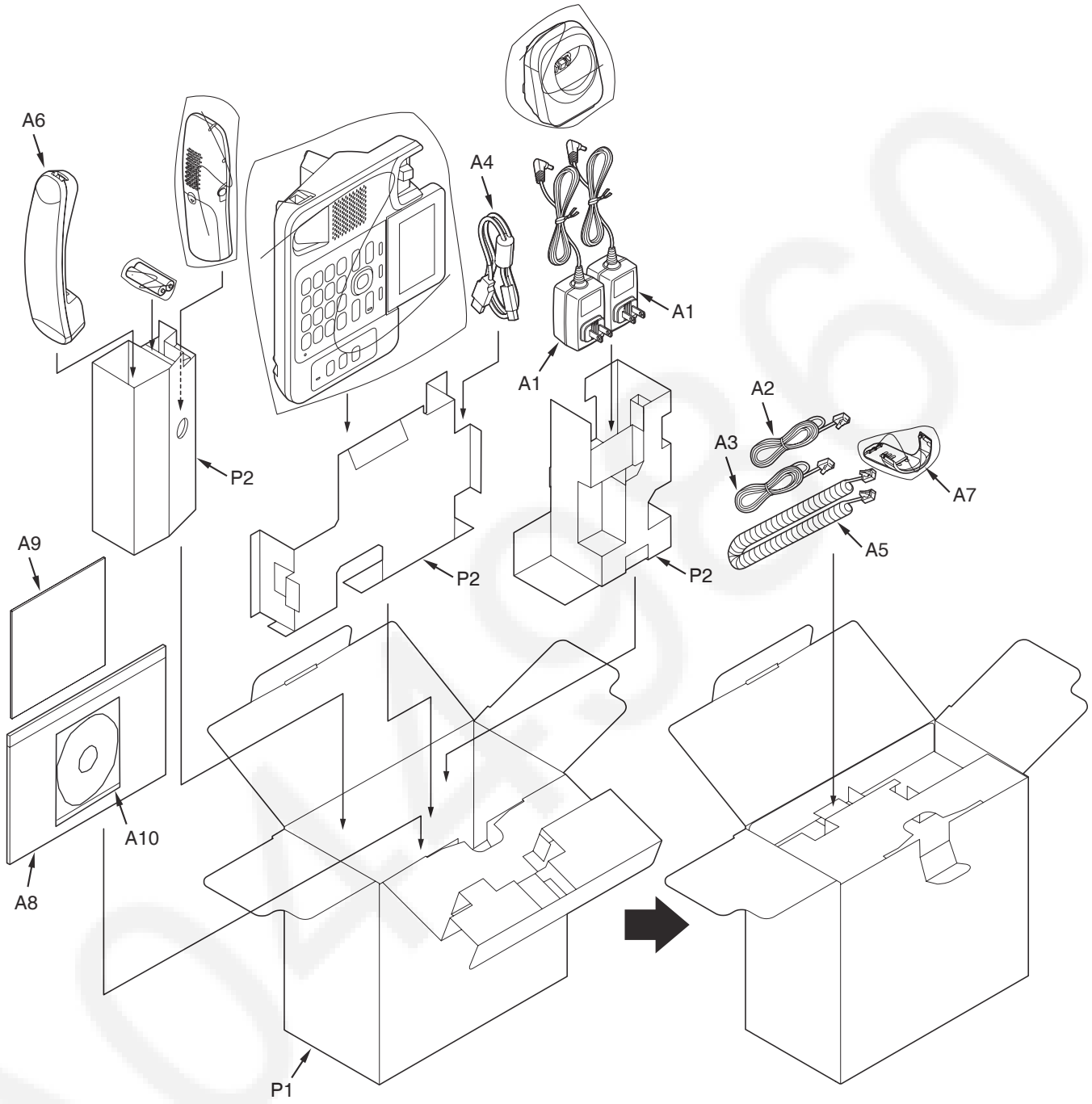
15.3. Cabinet and Electrical Parts (Charger Unit)



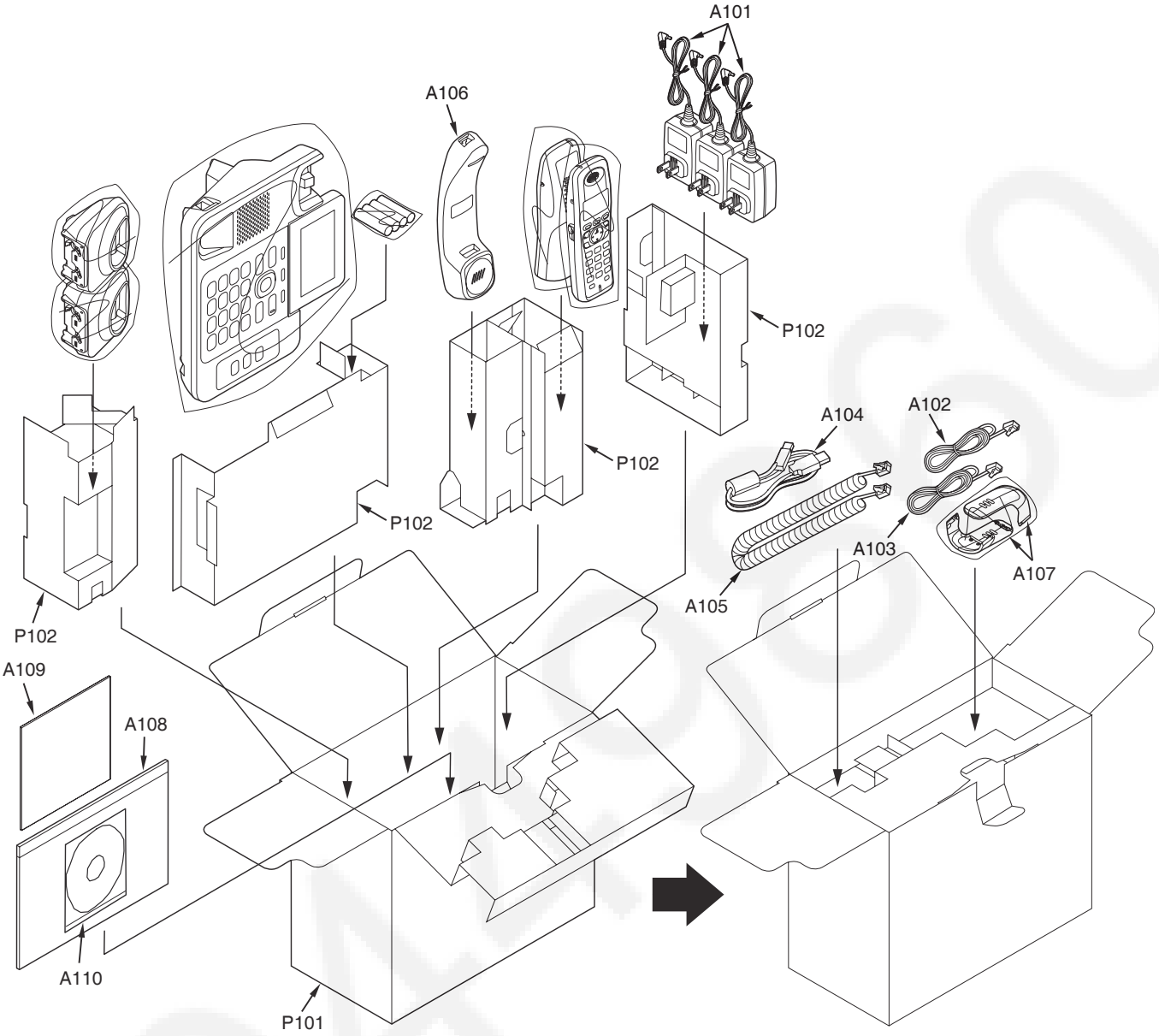
Ref.No.	Figure
B	 φ2×8 mm

15.4. Accessories and Packing Materials

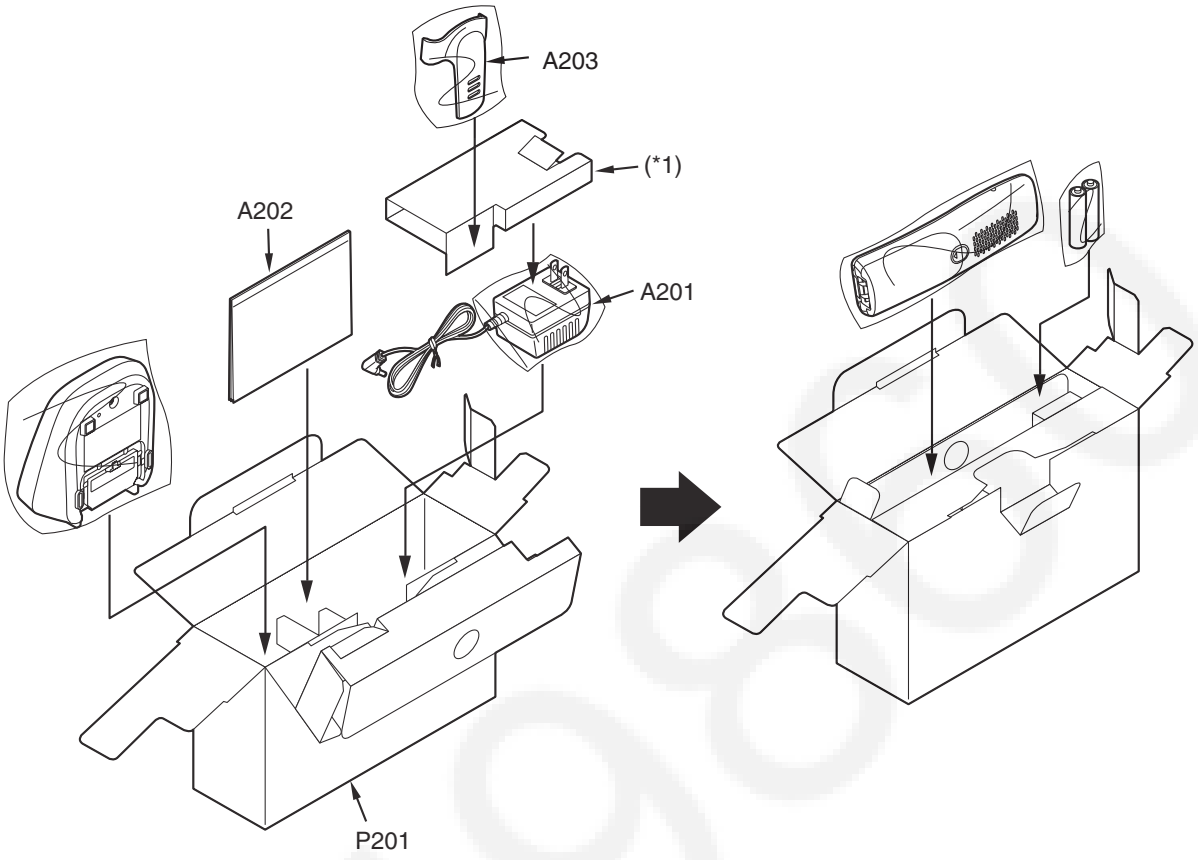
15.4.1. KX-TG9471B



15.4.2. KX-TG9472B



15.4.3. KX-TGA939T



Note:

(*1) This pad is a piece of Ref No.P201 (GIFT BOX).

15.5. Replacement Parts List

1. RTL (Retention Time Limited)

   Note:

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

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

   This period of time depends on the type of item, and the local laws governing parts and product retention. At the end of this period, the item will no longer be available.
2. Important safety notice

   Components identified by the ⚠ mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.
3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.
4. ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.
5. RESISTORS & CAPACITORS

   Unless otherwise specified;

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

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

   *Type & Wattage of Resistor

Type

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

Wattage

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

*Type & Voltage Of Capacitor

Type

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

Voltage

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

15.5.1. Base Unit

15.5.1.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	1	PNGP1199Z1	PANEL, LCD	
	2	PNGG1313Z1	GRILLE, LCD	PS-HB
	3	PNYE1055Z	SPACER, CUSHION LCD	
	4	L5DYBYY00034	LIQUID CRYSTAL DISPLAY	
	5	PNHX1466Z	COVER, DIFFUSION SHEET	
	6	PNHX1465Z	COVER, REFLECTOR SHEET	
	7	PNHR1528Z	LCD PLATE	PMMA-HB
	8	PNHR1527Z	GUIDE, LCD	ABS-HB
	9	PNHX1502Z	COVER, LCD SHEET	
	10	PNJE1121Z	LEAD WIRE, FFC	
	11	PNKV1136Z1	COVER, LCD	ABS-HB
	12	PNGP1198Z1	PANEL, UPPER	
	13	PNGP1204Z1	PANEL, LINE KEY	
	14	6SA522A	RUBBER PARTS, RING	
	15	PNKM1233Z1	UPPER CABINET	PS-HB
	16	PNBH1016Z1	HOOK LEVER	ABS-HB
	17	L0AA05A00097	SPEAKER	
	18	PNHR1529Z	GUIDE, SPEAKER	POM-HB
	19	PNBC1404Z1	BUTTON, NAVIGATOR KEY	ABS-HB
	20	PNBX1291Z1	BUTTON, 7 KEY	ABS-HB
	21	PNBX1289Z1	BUTTON, DIAL KEY	ABS-HB
	22	PNBC1345ZB	BUTTON, MESSAGE	PMMA-HB
	23	PNHR1533Z	OPTIC CONDUCTIVE PARTS, ANSWER ON LED LENS	PS-HB
	24	PNJK1137Z	KEYBOARD SWITCH, DIAL	
	25	PNBX1290Z1	BUTTON, LINE KEY	PMMA-HB
	26	PNHR1530Z	LINE KEY LENS	PS-HB
	27	PNJK1138Z	KEYBOARD SWITCH, LINE KEY	
	28	PNLA1072Z	ANTENNA	
	29	PNLA1073Z	ANTENNA	
	30	PQJJ1T030T	JACK, SOCKET	
	31	PQMG10025W	RUBBER PARTS, MIC	
	32	PNKF1172Z1	CABINET COVER	PS-HB
	33	PNHA1013Z	RUBBER PARTS, FOOT CUSHION	
	34	PNKL1034Z1	STAND, WALL MOUNT	ABS-HB
	35	PNGT6138Z	NAME PLATE	

15.5.1.2. Main P.C.Board Parts

Note:

(*1) When replacing IC501, IC551, IC761, IC901 or X501, data needs to be written to them with PNZZTG9471B. Refer to **How to download the data** (P.63) of **Things to Do after Replacing IC or X'tal** (P.63).

(*2) When replacing IC701, IC901, refer to **How to Replace the LLP (Leadless Leadframe Package) IC** (P.73).

(*3) How to written to USB, refer to **How to be written to USB_IC** (P.66).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB1	PNWP1TG9471H	MAIN P.C.BOARD ASS'Y (RTL)	
			(ICs)	
	IC161	C0ABBA000233	IC	
	IC171	YNJM2903MTE1	IC	S
	IC261	C0ABBA000233	IC	
	IC321	C0DBEYY00102	IC	
	IC331	C0DBEYY00102	IC	
	IC341	C0DBEYY00102	IC	
	IC501	C1CB00002704	IC (*1)	
	IC551	PNWI1TG9471H	IC (*1)	
	IC561	PNWI2TG9471H	IC	
	IC631	C0JBAF000223	IC	
	IC641	C0JBAF000223	IC	
	IC701	C1CB00002427	IC (*2)	
	IC761	C3FBMY000286	IC (*1)	
	IC901	C1CB00003661	IC (*1) (*2) (*3)	
	Q541	C0EBF0000419	IC	
			(TRANSISTORS)	
	Q101	B1ADGP000008	TRANSISTOR(SI)	
	Q103	UN5113	TRANSISTOR(SI)	S
	Q131	DSC7003S0L	TRANSISTOR(SI)	
	Q201	B1ADGP000008	TRANSISTOR(SI)	
	Q203	UN5113	TRANSISTOR(SI)	S
	Q231	DSC7003S0L	TRANSISTOR(SI)	
	Q381	B1ADGE000012	TRANSISTOR(SI)	
	Q386	B1ADGE000012	TRANSISTOR(SI)	
	Q387	B1ABDF000017	TRANSISTOR(SI)	
	Q621	DSA2001R0L	TRANSISTOR(SI)	
	Q622	PQVTDTC143E	TRANSISTOR(SI)	S

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	Q623	UN5213	TRANSISTOR(SI)	S
	Q761	PQVTDTC143E	TRANSISTOR(SI)	S
	Q772	B1ADGE000012	TRANSISTOR(SI)	
	Q773	UN5213	TRANSISTOR(SI)	S
	Q774	B1ABDF000017	TRANSISTOR(SI)	
	Q902	DSA2001R0L	TRANSISTOR(SI)	
			(DIODES)	
	D101	B0EDER000009	DIODE(SI)	
	D104	PQVDPTZT2530	DIODE(SI)	S
	D201	B0EDER000009	DIODE(SI)	
	D202	PQVDPTZT2530	DIODE(SI)	S
	D505	B0JCDD000002	DIODE(SI)	
	D631	1SS355	DIODE(SI)	S
	D632	1SS355	DIODE(SI)	S
	D633	1SS355	DIODE(SI)	S
	D634	1SS355	DIODE(SI)	S
	D636	1SS355	DIODE(SI)	S
	D637	1SS355	DIODE(SI)	S
	D638	1SS355	DIODE(SI)	S
	D645	1SS355	DIODE(SI)	S
	D741	MAZ805100L	DIODE(SI)	S
	D742	MAZ805100L	DIODE(SI)	S
	D751	MAZ805100L	DIODE(SI)	S
	D752	MAZ805100L	DIODE(SI)	S
	D771	MAZ805100L	DIODE(SI)	S
	D772	MAZ805100L	DIODE(SI)	S
	D801	B0DDCD000001	DIODE(SI)	
	IC906	B0ZBZ0000146	DIODE(SI)	
			(JACKS)	
	CN101	K2LB1YYB0001	JACK, MODULAR	
	CN201	K2LB102B0059	JACK, MODULAR	
	CN301	K2ECYB000001	JACK, DC	
			(COILS)	
	L621	PQLQR4F601ST	COIL	S
	L622	PQLQR4F601ST	COIL	S
	L741	PQLQR1WT	COIL	S
	L742	PQLQR1WT	COIL	S
	L745	PQLQR1RS241	COIL	S
	L746	PQLQR1RS241	COIL	S
	L751	PQLQR2KA20T	COIL	S
	L752	PQLQR2KA20T	COIL	S
	L771	PQLQR2KA20T	COIL	S
	L772	PQLQR2KA20T	COIL	S
	L803	G1C33NJ00009	COIL	
	L805	PQLQR4C6N8J	COIL	S
	L806	PQLQR4C6N8J	COIL	S
	C809	G1C1N5Z00005	COIL	
			(FILTERS)	
	L108	EXCELDR35	FILTER	
	L109	EXCELDR35	FILTER	
	L208	EXCELDR35	FILTER	
	L209	EXCELDR35	FILTER	
			(RESISTOR ARRAYS)	
	RA571	D1H81014A024	RESISTOR ARRAY	
	RA572	D1H81014A024	RESISTOR ARRAY	
	RA573	D1H81014A024	RESISTOR ARRAY	
	RA574	D1H81014A024	RESISTOR ARRAY	
			(IC FILTERS)	
	L963	J0JCC0000117	IC FILTER	
	L964	J0JCC0000117	IC FILTER	
	R515	J0JCC0000275	IC FILTER	
			(CERAMIC FILTERS)	
	L961	PFVF2P600SG	CERAMIC FILTER	S
	L962	PFVF2P600SG	CERAMIC FILTER	S
	L965	PFVF2P600SG	CERAMIC FILTER	S
			(PHOTO ELECTRIC TRANS-DUCERS)	
	PC102	B3PBB0000039	PHOTO ELECTRIC TRANS-DUCER	
	PC202	B3PBB0000039	PHOTO ELECTRIC TRANS-DUCER	
	IC902	B3PBA0000601	PHOTO ELECTRIC TRANS-DUCER	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	IC903	B3PBA0000601	PHOTO ELECTRIC TRANSDUCER	
	IC904	B3PBA0000297	PHOTO ELECTRIC TRANSDUCER	
	IC905	B3PBA0000297	PHOTO ELECTRIC TRANSDUCER	
			(RF)	
	IC801	PQLP10293Z	RF UNIT	
			(VARISTORS)	
	SA101	J0LE00000047	VARISTOR (SURGE ABSORBER)	
	SA102	J0LE00000047	VARISTOR (SURGE ABSORBER)	
	SA201	J0LE00000047	VARISTOR (SURGE ABSORBER)	
	SA202	J0LE00000047	VARISTOR (SURGE ABSORBER)	
			(TRANSFORMERS)	
	T141	PFLT8D001	TRANSFORMER	S
	T146	PFLT8D001	TRANSFORMER	S
	T241	PFLT8D001	TRANSFORMER	S
	T246	PFLT8D001	TRANSFORMER	S
			(CONNECTORS)	
	CN601	K1MN08BA0111	CONNECTOR	
	CN901	K1FY105EA011	CONNECTOR	
			(RESISTORS)	
	R101	ERJ3GEYJ104	100k	S
	R102	PQ4R10XJ472	4.7k	S
	R103	ERJ3GEYJ106	10M	S
	R104	ERJ3GEYJ106	10M	S
	R105	ERJ2GEJ222	2.2k	S
	R111	PQ4R10XJ825	8.2M	S
	R112	PQ4R10XJ825	8.2M	S
	R113	ERJ2GEJ564	560k	S
	R114	ERJ3GEYJ564	560k	S
	R120	ERJ2GEJ222	2.2k	S
	R121	ERJ3GEYJ103	10k	S
	R122	ERJ3GEYJ102	1k	S
	R124	ERJ12YJ120	12	
	R125	ERJ12YJ270	27	
	R126	ERJ3GEYJ104	100k	S
	R128	ERJ3GEYJ222	2.2k	S
	R132	ERJ3GEY0R00	0	S
	R133	ERJ3GEYJ820	82	S
	R134	ERJ3GEYJ821	820	S
	R136	ERJ3GEYJ473	47k	S
	R141	ERJ3GEY0R00	0	S
	R151	PQ4R10XJ475	4.7M	S
	R152	PQ4R10XJ184	180k	S
	R153	PQ4R10XJ105	1M	S
	R156	PQ4R10XJ475	4.7M	S
	R157	PQ4R10XJ184	180k	S
	R158	PQ4R10XJ105	1M	S
	R161	ERJ2GEJ100	10	S
	R162	ERJ2GEJ563	56k	S
	R165	ERJ3GEYJ563	56k	S
	R167	ERJ2GE0R00	0	S
	R168	ERJ2GEJ222	2.2k	S
	R171	ERJ2GEJ273X	27k	S
	R172	ERJ2GEJ104	100k	S
	R173	ERJ2GEJ103	10k	S
	R174	ERJ3GEYJ273	27k	S
	R175	ERJ2GEJ223	22k	S
	R176	ERJ3GEYJ472	4.7k	S
	R177	ERJ2GEJ561	560	S
	R192	ERJ2GEJ104	100k	S
	R201	ERJ3GEYJ104	100k	S
	R202	PQ4R10XJ472	4.7k	S
	R203	ERJ3GEYJ106	10M	S
	R204	ERJ3GEYJ106	10M	S
	R205	ERJ2GEJ222	2.2k	S
	R211	PQ4R10XJ825	8.2M	S
	R212	PQ4R10XJ825	8.2M	S
	R213	ERJ2GEJ564	560k	S

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R214	ERJ3GEYJ564	560k	S
	R221	ERJ3GEYJ103	10k	S
	R222	ERJ3GEYJ102	1k	S
	R224	ERJ12YJ120	12	
	R225	ERJ12YJ270	27	
	R226	ERJ3GEYJ104	100k	S
	R228	ERJ3GEYJ222	2.2k	S
	R232	ERJ3GEY0R00	0	S
	R233	ERJ3GEYJ820	82	S
	R234	ERJ3GEYJ821	820	S
	R236	ERJ3GEYJ473	47k	S
	R241	ERJ3GEY0R00	0	S
	R251	PQ4R10XJ475	4.7M	S
	R252	PQ4R10XJ184	180k	S
	R253	PQ4R10XJ105	1M	S
	R256	PQ4R10XJ475	4.7M	S
	R257	PQ4R10XJ184	180k	S
	R258	PQ4R10XJ105	1M	S
	R261	ERJ2GEJ100	10	S
	R262	ERJ2GEJ563	56k	S
	R265	ERJ3GEYJ563	56k	S
	R271	ERJ2GEJ273X	27k	S
	R272	ERJ2GEJ104	100k	S
	R273	ERJ2GEJ103	10k	S
	R274	ERJ2GEJ273X	27k	S
	R275	ERJ2GEJ223	22k	S
	R276	ERJ2GEJ472X	4.7k	S
	R277	ERJ2GEJ561	560	S
	R321	ERJ2RKF3300	330	
	R322	ERJ2RKF3300	330	
	R341	ERJ2RKF1500	150	
	R342	ERJ2RKF3300	330	
	R381	ERJ2GEJ562X	5.6k	S
	R382	ERJ2RKF1302	13k	
	R383	ERJ2RKF5601	5.6k	
	R386	ERJ2GEJ153	15k	S
	R387	ERJ2GEJ103	10k	S
	R388	ERJ2GEJ224	220k	S
	R428	ERJ2GEJ222	2.2k	S
	R503	ERJ2GE0R00	0	S
	R505	ERJ2GEJ103	10k	S
	R506	ERJ2GE0R00	0	S
	R507	ERJ2GEJ103	10k	S
	R508	ERJ2GEJ103	10k	S
	R516	ERJ2GEJ271	270	S
	R552	ERJ2GEJ222	2.2k	S
	R553	ERJ2GEJ222	2.2k	S
	R554	ERJ2GEJ104	100k	S
	R591	ERJ2GEJ101	100	S
	R592	ERJ2GEJ271	270	S
	R593	ERJ2GEJ102	1k	S
	R596	ERJ2GEJ102	1k	S
	R598	ERJ2GEJ393X	39k	S
	R601	ERJ2GEJ104	100k	S
	R602	ERJ2GEJ104	100k	S
	R603	ERJ2GEJ104	100k	S
	R604	ERJ2GEJ104	100k	S
	R613	ERJ2GEJ391	390	S
	R614	ERJ2GEJ391	390	S
	R615	ERJ2GEJ391	390	S
	R616	ERJ2GEJ391	390	S
	R617	ERJ2GEJ391	390	S
	R618	ERJ2GEJ391	390	S
	R622	ERJ2GEJ561	560	S
	R624	ERJ2GEJ4R7	4.7	S
	R625	ERJ2GEJ4R7	4.7	S
	R641	ERJ2GEJ103	10k	S
	R642	ERJ2GEJ103	10k	S
	R643	ERJ2GEJ103	10k	S
	R703	ERJ2GEJ104	100k	S
	R704	ERJ2GEJ102	1k	S
	R705	ERJ2GEJ473	47k	S
	R706	ERJ2GEJ473	47k	S

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R721	ERJ2GEJ330	33	S
	R722	ERJ2GEJ330	33	S
	R724	ERJ2GEJ222	2.2k	S
	R727	ERJ2GEJ331	330	S
	R728	ERJ2GEJ471	470	S
	R743	ERJ3GEYJ6R8	6.8	S
	R751	ERJ2GEJ150	15	S
	R752	ERJ2GEJ150	15	S
	R754	ERJ2GEJ472X	4.7k	S
	R764	ERJ2GEJ561	560	S
	R765	ERJ2GEJ473	47k	S
	R771	ERJ2GEJ222	2.2k	S
	R772	ERJ2GEJ222	2.2k	S
	R773	ERJ2GEJ222	2.2k	S
	R774	ERJ2GEJ222	2.2k	S
	R776	ERJ2GEJ473	47k	S
	R777	ERJ2GEJ223	22k	S
	R779	ERJ2GEJ560X	56	S
	R780	ERJ2GEJ560X	56	S
	R801	ERJ2GEJ181	180	S
	R803	ERJ2GEJ561	560	S
	R804	ERJ2GEJ561	560	S
	R806	ERJ2GEJ331	330	S
	R807	ERJ2GEJ102	1k	S
	R808	ERJ2GEJ561	560	S
	R809	ERJ2GEJ181	180	S
	R810	ERJ2GEJ473	47k	S
	R811	ECUE1H100DCQ	10p	
	R812	ECUE1H100DCQ	10p	
	R963	ERJ2RKF2000	200	
	R964	ERJ2RKF3300	330	
	R966	ERJ2GEJ472X	4.7k	S
	R967	ERJ2GEJ391	390	S
	R968	ERJ2GEJ101	100	S
	R969	ERJ2GEJ911	910	S
	R970	ERJ2GEJ123	12k	S
	R971	ERJ2GEJ102	1k	S
	R972	ERJ2GEJ331	330	S
	R973	ERJ2GEJ271	270	S
	R974	ERJ2GEJ182	1.8k	S
	R975	ERJ2GEJ182	1.8k	S
	R976	ERJ2GEJ222	2.2k	S
	R977	ERJ2GEJ153	15k	S
	R978	ERJ2GEJ101	100	S
	L850	ERJ3GEY0R00	0	S
			(CAPACITORS)	
	C102	ECUV2H681KB	680p	S
	C103	ECUV2H681KB	680p	S
	C105	ECUV1H103KBV	0.01	
	C121	EEE1CA100SR	10	
	C122	ECUV1H472KBV	0.0047	
	C124	ECUV1H100DCV	10p	
	C125	F1K1C2250005	2.2	
	C128	PQCUV1A105KB	1	
	C133	F1K1C4750023	10	
	C141	ECUE1C103KBQ	0.01	
	C143	EEE1HA010SR	1	
	C151	ECUV1H103KBV	0.01	
	C152	ECUV1C103KBV	0.01	
	C153	ECUV2H681KB	680p	S
	C161	ECUV1A105KBV	1	
	C162	ECUE1H221JCQ	220p	
	C172	ECUE1C104KBQ	0.1	
	C173	EEE1CA100SR	10	
	C174	ECUV1A105KBV	1	
	C177	ECUE1H102KBQ	0.001	
	C202	ECUV2H681KB	680p	S
	C203	ECUV2H681KB	680p	S
	C205	ECUV1H103KBV	0.01	
	C222	ECUV1H472KBV	0.0047	
	C224	ECUV1H100DCV	10p	
	C225	F1K1C2250005	1	
	C228	PQCUV1A105KB	1	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C233	F1K1C4750023	10	
	C237	EEE1HA010SR	1	
	C241	ECUE1C103KBQ	0.01	
	C242	ECUE1C103KBQ	0.01	
	C261	ECUV1A105KBV	1	
	C262	ECUE1H221JCQ	220p	
	C264	ECUE1H100DCQ	10p	
	C272	ECUE1C104KBQ	0.1	
	C277	ECUE1H102KBQ	0.001	
	C301	EEE1CA101WP	100	
	C302	ECUE1H101JCQ	100p	
	C303	ECUV1H103KBV	0.01	
	C322	ECUV1A105KBV	1	
	C331	ECUV1A105KBV	1	
	C332	ECUV1A105KBV	1	
	C501	ECUE1A104KBQ	0.1	
	C503	ECUE1A104KBQ	0.1	
	C504	ECUE1A104KBQ	0.1	
	C507	ECUE1A104KBQ	0.1	
	C508	ECUE1A104KBQ	0.1	
	C509	ECUE1A104KBQ	0.1	
	C511	ECUE1H6R0CCQ	6	
	C512	ECUE1H100DCQ	10p	
	C521	ECUE1H331KBQ	330p	
	C528	ECUE1H331KBQ	330p	
	C601	ECUE1H101JCQ	100p	
	C603	ECUE1H101JCQ	100p	
	C604	ECUE1H101JCQ	100p	
	C611	ECUE1A104KBQ	0.1	
	C631	ECUE1A104KBQ	0.1	
	C802	ECUE1H7R0CCQ	7	
	C807	ECUE1H100DCQ	10p	
	C808	ECUE1H100DCQ	10p	
	C815	ECUE1H3R0CCQ	3	
	C816	PQCUV0J475MB	4.7	
	C817	ECUE1H100DCQ	10p	
	C106	ECUV1A224KBV	0.22	
	C107	ECUV2H681KB	680p	S
	C113	ECJ0EB1A563K	0.056	S
	C114	ECJ0EB1A563K	0.056	S
	C115	ECUE1H102KBQ	0.001	
	C127	ECUV1H472KBV	0.0047	
	C131	ECUE1H100DCQ	10p	
	C137	EEE1HA010SR	1	
	C142	ECUE1C103KBQ	0.01	
	C146	EEE1CA100SR	10	
	C147	ECUE1C103KBQ	0.01	
	C148	ECUE1C103KBQ	0.01	
	C156	ECUV1H103KBV	0.01	
	C157	ECUV1C103KBV	0.01	
	C158	ECUV2H681KB	680p	S
	C163	ECUE1H100DCQ	10p	
	C164	ECUE1H100DCQ	10p	
	C165	ECUE1H221JCQ	220p	
	C166	ECUE1H102KBQ	0.001	
	C178	ECUE1H102KBQ	0.001	
	C179	ECUE1H102KBQ	0.001	
	C180	ECUE1H102KBQ	0.001	
	C206	ECUV1A224KBV	0.22	
	C213	ECJ0EB1A563K	0.056	S
	C214	ECJ0EB1A563K	0.056	S
	C215	ECUE1H102KBQ	0.001	
	C221	EEE1CA100SR	10	
	C227	ECUV1H472KBV	0.0047	
	C231	ECUE1H100DCQ	10p	
	C243	EEE1HA010SR	1	
	C246	EEE1CA100SR	10	
	C247	ECUE1C103KBQ	0.01	
	C248	ECUE1C103KBQ	0.01	
	C251	ECUV1H103KBV	0.01	
	C252	ECUV1C103KBV	0.01	
	C253	ECUV2H681KB	680p	S
	C256	ECUV1H103KBV	0.01	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C257	ECUV1C103KBV	0.01	
	C258	ECUV2H681KB	680p	S
	C263	ECUE1H100DCQ	10p	
	C265	ECUE1H221JCQ	220p	
	C266	ECUE1H102KBQ	0.001	
	C278	ECUE1H102KBQ	0.001	
	C279	ECUE1H102KBQ	0.001	
	C280	ECUE1H102KBQ	0.001	
	C313	ECUE1H101JCQ	100p	
	C314	ECUV1A105KBV	1	
	C321	EEE0JA331P	330	
	C341	ECUV1A105KBV	1	
	C342	ECUV1A105KBV	1	
	C382	ECUV1A105KBV	1	
	C386	EEE0JA101SP	100	
	C387	ECUV1A105KBV	1	
	C388	ECUV1A105KBV	1	
	C502	ECUE1A104KBQ	0.1	
	C505	ECUE1A104KBQ	0.1	
	C506	ECUE1H331KBQ	330p	
	C518	ECUE1A104KBQ	0.1	
	C541	ECUE1A104KBQ	0.1	
	C542	ECUV1H103KBV	0.01	
	C543	ECUE1A224KBQ	0.22	
	C551	ECUE1A104KBQ	0.1	
	C561	ECUE1A104KBQ	0.1	
	C562	ECUE1H101JCQ	100p	
	C563	ECUE1H101JCQ	100p	
	C602	ECUE1H101JCQ	100p	
	C613	ECUE1A104KBQ	0.1	
	C641	ECUE1A104KBQ	0.1	
	C649	ECUE1H102KBQ	0.001	
	C650	ECUE1H221KBQ	220p	
	C651	ECUE1H221KBQ	220p	
	C701	ECUE1A104KBQ	0.1	
	C702	ECUE1H100DCQ	10p	
	C703	ECUE1A104KBQ	0.1	
	C704	ECUE1H102KBQ	0.001	
	C705	ECUE1A104KBQ	0.1	
	C706	ECUE1A104KBQ	0.1	
	C707	ECUE1A104KBQ	0.1	
	C708	ECUE1A104KBQ	0.1	
	C725	ECUE1H100DCQ	10p	
	C726	ECUE1A104KBQ	0.1	
	C727	EEE1CA100SR	10	
	C728	ECUE1A104KBQ	0.1	
	C741	ECUE1H100DCQ	10p	
	C742	ECUE1H100DCQ	10p	
	C743	EEE0JA101WR	100	
	C744	ECUE0J105KBQ	1	
	C745	ECUE1H100DCQ	10p	
	C746	ECUE1H100DCQ	10p	
	C747	ECUE1H331KBQ	330p	
	C748	ECUE1H331KBQ	330p	
	C751	F1K1C4750023	10	
	C752	F1K1C4750023	10	
	C753	ECUV1A105KBV	1	
	C754	ECUE1H681KBQ	680p	
	C755	ECUE1H681KBQ	680p	
	C761	ECUE1A104KBQ	0.1	
	C765	ECUE1A104KBQ	0.1	
	C770	ECUE1H331KBQ	330p	
	C771	ECUE1A104KBQ	0.1	
	C772	ECUE1A104KBQ	0.1	
	C773	ECUV1H102KBV	0.001	
	C775	ECUE1H222KBQ	0.0022	
	C776	ECUE1H222KBQ	0.0022	
	C778	ECUE1H222KBQ	0.0022	
	C780	ECUE1H680JCQ	68p	
	C781	ECUE1H101JCQ	100p	
	C782	F1G1H331A541	330p	S
	C783	ECUE1H101JCQ	100p	
	C784	ECUE1H331KBQ	330p	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C803	ECUE1H7R0CCQ	7	
	C814	ECUE1H100DCQ	10p	
	C819	ECUE1H100DCQ	10p	
	C821	ECUE1H220JCQ	22p	
	C824	ECUE1H220JCQ	22p	
	C831	ECUE1H151JCQ	150p	
	C832	ECUE1H102KBQ	0.001	
	C901	EEE1HA4R7SR	4.7	
	C902	ECUE1A104KBQ	0.1	
	C903	ECUV1A105KBV	1	
	C904	PQCUV0J475MB	4.7	
	C905	ECUE1H101JCQ	100p	
	C906	ECUE1H102KBQ	0.001	
	C907	ECUE1A104KBQ	0.1	
	C908	ECUE0J105KBQ	1	
	C909	F1G1H331A541	330p	S
	C910	ECUE1H101JCQ	100p	
			(OTHERS)	
	MIC1	L0CBAY000016	MICROPHONE	
	PO101	PFRT002	THERMISTOR (POSISTOR)	S
	PO201	PFRT002	THERMISTOR (POSISTOR)	S
⚠	F301	K5H302Y00003	FUSE	
	X501	H0J103500024	CRYSTALOSCILLATOR(*1)	

15.5.1.3. Operational P.C.Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB2	PNWP2TG9471H	OPERATIONAL P.C.BOARD ASS'Y (RTL)	
			(LEDS)	
	LED901	B3ABB0000331	LED	
	LED902	LNJ826W83RA	LED	
	LED903	LNJ826W83RA	LED	
	LED904	LNJ826W83RA	LED	
	LED905	LNJ826W83RA	LED	
	LED906	LNJ826W83RA	LED	
			(SWITCH)	
	SW1	K0L1LB000021	SPECIAL SWITCH	

15.5.1.4. LCD Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB3	PNWP3TG9471H	LCD RELAY P.C.BOARD ASS'Y (RTL)	
			(RESISTORS)	
	R7	PQ4R10XJ560	56	S
	R8	PQ4R10XJ221	220	S
	R9	PQ4R10XJ560	56	S
	R10	PQ4R10XJ221	220	S
	R11	PQ4R10XJ221	220	S
	R12	PQ4R10XJ105	1M	S
	R13	ERJ6GEY0R00	0	S
			(CAPACITORS)	
	C1	F1H1E1050001	1	
	C2	F1H1E1050001	1	
	C3	F1H1E1050001	1	
	C4	F1H1E1050001	1	
	C5	F1H1E1050001	1	
	C6	F1H1E1050001	1	
	C7	F1H1E1050001	1	
	C8	F1H1E1050001	1	
	C9	F1H1E1050001	1	
	C10	F1H1E1050001	1	
	C12	ECUV1H221JCV	220p	
	C13	ECUV1H221JCV	220p	
	C14	ECUV1H680JCV	68p	
	C15	ECUV1H101JCV	100p	
	C16	ECUV1H221JCV	220p	
			(CONNECTORS)	
	CN1	K1MN08BA0111	CONNECTOR	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	CN2	K1MN20BA0111	CONNECTOR	

15.5.1.5. LED Board parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
			(LEDS)	
	LED1	B3AFB0000211	LED	
	LED2	B3AFB0000211	LED	
			(RESISTORS)	
	R14	ERJ3GEYJ330	33	S
	R15	ERJ3GEYJ330	33	S

15.5.2. Portable

15.5.2.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	101	PNGP1002X1	PANEL, LCD	AS-HB
	102	PNHS1002Z	TAPE, DOUBLE SIDED	
	103	PNKM1052Z1	CABINET BODY	PS-HB
	104	PNHR1005Z	OPTIC CONDUCTIVE PARTS, LED LENS	PS-HB
	105	PQHS10722Y	SPACER, CUSHION LCD	
	106	PNHS1001Z	COVER, SP NET	
	107	L0AD02A00043	RECEIVER	
	108	PQHG10756Z	RUBBER PARTS, RECEIVER	
	109	PNBC1008Y2	BUTTON, TALK	ABS-HB
	110	PNBC1009Y2	BUTTON, OFF	ABS-HB
	111	PNBC1010Y2	BUTTON, SP	ABS-HB
	112	PNBC1011Y2	BUTTON, PAUSE	ABS-HB
	113	PNBC1003X4	BUTTON, NAVIGATOR KEY	ABS-HB
	114	PNBX1027Z1	KEYBOARD SWITCH	PMMA-HB
	115	PNJK1031Z	RUBBER SWITCH	
	116	PNJT1002Y	CHARGE TERMINAL (R)	
	117	PNJT1001Y	CHARGE TERMINAL (L)	
	118	PQHR11313Z	GUIDE, SPEAKER	ABS-HB
	119	PQHG10729Z	RUBBER PARTS, SPEAKER	
	120	L0AD02A00026	SPEAKER	
	121	PQHS10622Z	SPACER, SPEAKER NET	
	122	PNLA1005Z	ANTENNA	
	123	PNKE1002Z2	COVER, EP CAP	
	124	PQJC10056X	BATTERY TERMINAL	
	125	PNKF1006Z1	CABINET COVER	ABS-HB
	126	PNQT1230Y	LABEL, BATTERY	
	127	PQHS10561Y	SPACER, BATTERY	
	128	PNKK1001Z2	LID, BATTERY	ABS-HB
	129	PNGT1490Z	NAME PLATE	
	130	PNYNTGA939TR	LID, BATTERY ASS'Y	
	131	PNHX1036Z	COVER, LCD SHEET	

15.5.2.2. Main P.C.Board Parts

Note:

(*1) When replacing IC1, IC3 or X1, data needs to be written to them with PNZZTG9471B. Refer to **Portable** (P.68) of **Things to Do after Replacing IC or X'tal** (P.63).

(*2) Flash type of BBIC needs software downloading. Refer to **Portable** (P.68) of **Things to Do after Replacing IC or X'tal** (P.63).

(*3) When replacing the portable LCD, See **How to Replace the Portable LCD** (P.55).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB100	PNWPTGA939TR	MAIN P.C.BOARD ASS'Y (RTL)	
			(ICs)	
	IC1	C1CB00002906	IC (BBIC (FLASH)) (*1) (*2)	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	IC3	PNWITGA939TR	IC (EEPROM) (*1)	
	IC801	C1CB00001842	IC	
			(TRANSISTORS)	
	Q2	B1ADGE000004	TRANSISTOR(SI)	
	Q4	B1ADGE000004	TRANSISTOR(SI)	
	Q7	UN9219J	TRANSISTOR(SI)	S
	Q9	2SC6054JSL	TRANSISTOR(SI)	
	Q13	B1ABDF000026	TRANSISTOR(SI)	S
	Q14	B1ABDF000026	TRANSISTOR(SI)	S
			(DIODES)	
	D1	B0JCMC000006	DIODE(SI)	
	D5	1SS355	DIODE(SI)	S
	D7	B0JCME000035	DIODE(SI)	
	D21	MA8043M	DIODE(SI)	S
	D22	MA8043M	DIODE(SI)	S
	D801	MA27P1200L	DIODE(SI)	
	D802	MA27P1200L	DIODE(SI)	
	DA1	B0DDCL000001	DIODE(SI)	
			(LEDS)	
	LED2	B3ACB0000216	LED	
	LED3	B3ACB0000216	LED	
	LED5	B3ACB0000216	LED	
	LED6	B3ACB0000216	LED	
	LED12	B3ACB0000216	LED	
			(JACK)	
	CN4	K2HD103D0001	JACK	
			(COILS)	
	L4	G1C100MA0072	COIL	
	L5	G1C100MA0072	COIL	
	L805	PQLQR4F121ST	COIL	S
	C812	ELJRF3N3ZFB	COIL	
	F1	PQLQR2M5N6K	COIL	S
			(RESISTOR ARRAYS)	
	RA4	D1H433220001	RESISTOR ARRAY	
	RA61	D1H410220001	RESISTOR ARRAY	
			(IC FILTERS)	
	L9	J0JCC0000287	IC FILTER	
	L72	J0JCC0000276	IC FILTER	
	R46	J0JDC0000045	IC FILTER	
	R47	J0JDC0000045	IC FILTER	
	R308	J0JCC0000286	IC FILTER	
			(VARISTORS)	
	D8	D4ED1270A014	VARISTOR	
	D13	D4ZZ00000032	VARISTOR	
	D14	D4ZZ00000032	VARISTOR	
			(RESISTORS)	
	R2	ERJ2GEJ392	3.9k	S
	R6	ERJ2GEJ102	1k	S
	R7	ERJ2GEJ122	1.2k	S
	R8	ERJ2GEJ101	100	S
	R12	ERJ2GE0R00	0	S
	R15	ERJ2GE0R00	0	S
	R16	ERJ2GE0R00	0	S
	R20	ERJ2GEJ100	10	S
	R22	ERJ2GEJ332	3.3k	S
	R23	ERJ2GEJ102	1k	S
	R25	ERJ2GEJ222	2.2k	S
	R27	ERJ3GEYJ821	820	S
	R28	ERJ2GEJ821	820	S
	R29	ERJ2GEJ102	1k	S
	R32	ERJ2GEJ104	100k	S
	R34	ERJ2GEJ104	100k	S
	R40	ERJ2GEJ103	10k	S
	R41	ERJ2GEJ472X	4.7k	S
	R42	ERJ2GEJ103	10k	S
	R45	ERJ6RSJR10V	0.1	
	R50	ERJ2GEJ332	3.3k	S
	R51	ERJ2GEJ471	470	S
	R52	ERJ2GEJ221	220	S
	R53	ERJ2GEJ332	3.3k	S
	R54	ERJ2GEJ103	10k	S
	R63	ERJ2GEJ101	100	S
	R64	ERJ2GEJ103	10k	S

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R66	ERJ2GEJ102	1k	S
	R71	ERJ3GEYJ181	180	S
	R72	ERJ2GE0R00	0	S
	R106	ERJ2GE0R00	0	S
	R107	ERJ2GEJ221	220	S
	R108	ERJ2GEJ221	220	S
	R109	ERJ2GE0R00	0	S
	R148	ERJ3GEYJ273	27k	S
	R181	ERJ2GE0R00	0	S
	R203	D0GA563ZA006	56k	
	R206	ECUE1H100DCQ	10p	
	R207	ECUE1H100DCQ	10p	
	R215	ERJ2GE0R00	0	S
	R222	ERJ2GE0R00	0	S
	R233	ERJ2GEJ102	1k	S
	R234	ERJ2GEJ102	1k	S
	R235	ERJ2GEJ102	1k	S
	R238	ERJ2GEJ102	1k	S
	R244	ERJ2GE0R00	0	S
	R248	ERJ2GE0R00	0	S
	R301	ERJ2GEJ221	220	S
	R302	ERJ2GEJ221	220	S
	R304	ERJ2GEJ221	220	S
	R305	ERJ2GEJ221	220	S
	R306	ERJ2GEJ101	100	S
	R340	ERJ2GEJ222	2.2k	S
	R341	ERJ2GEJ473	47k	S
	R343	ERJ2GEJ105X	1M	S
	R344	ERJ2GEJ224	220k	S
	R345	ERJ2GEJ104	100k	S
	R801	ERJ2GEJ182	1.8k	S
	R802	F1G1HR50A480	0.5p	
	R803	ERJ2GEJ102	1k	S
	R804	ERJ2GEJ102	1k	S
	R805	ERJ2GEJ470	47	S
	R806	ERJ2GEJ221	220	S
	R807	ERJ2GEJ221	220	S
	L10	ERJ2GEJ330	33	S
	L11	ERJ2GEJ330	33	S
	L71	ERJ2GE0R00	0	S
	L74	ERJ2GEJ100	10	S
			(CAPACITORS)	
	C1	EEE0JA221WP	220	
	C2	EEE0JA331P	330	
	C3	ECUV1A105KBV	1	
	C11	ECUE1A104KBQ	0.1	
	C12	PQCUV0J106KB	10	
	C13	ECUE1A104KBQ	0.1	
	C14	ECUE1C103KBQ	0.01	
	C16	PQCUV0J106KB	10	
	C33	ECUE1A104KBQ	0.1	
	C40	ECUE1A104KBQ	0.1	
	C43	ECUE1H100DCQ	10p	
	C44	ECUE1A104KBQ	0.1	
	C45	ECUE1A104KBQ	0.1	
	C46	ECUE1H100DCQ	10p	
	C47	ECUV1A105KBV	1	
	C48	ECUV1A225KBV	2.2	
	C49	ECUV1A105KBV	1	
	C50	ECUV1A105KBV	1	
	C51	ECUV1A105KBV	1	
	C52	PQCUV0J106KB	10	
	C53	PQCUV0J106KB	10	
	C70	ECUE1H100DCQ	10p	
	C71	ECUE1H100DCQ	10p	
	C72	ECUE1H100DCQ	10p	
	C73	ECUE1H100DCQ	10p	
	C82	ECUE1H471KBQ	470p	
	C83	ECUE1H100DCQ	10p	
	C86	PQCUV0J106KB	10	
	C96	ECUE1H100DCQ	10p	
	C97	ECUE1H100DCQ	10p	
	C103	ECUE1H101JCQ	100p	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C104	ECUE1H101JCQ	100p	
	C105	ECUE1H101JCQ	100p	
	C110	ECUE1H102KBQ	0.001	
	C117	ECUE1H100DCQ	10p	
	C118	ECUE1H100DCQ	10p	
	C122	F1G1H1R8A480	1.8p	
	C124	ECUE1H100DCQ	10p	
	C125	ECUE1H100DCQ	10p	
	C127	ECUE1H102KBQ	0.001	
	C147	ECUV1A105KBV	1	
	C152	ECUE1H102KBQ	0.001	
	C170	ECUE1H100DCQ	10p	
	C171	ECUV1H100DCV	10p	
	C172	ECUV1C104KBV	0.1	
	C173	ECUV1C105KBV	1	
	C174	ECUV1C105KBV	1	
	C175	ECUV1C105KBV	1	
	C176	ECUV1C105KBV	1	
	C177	ECUV1C474KBV	0.47	
	C178	ECUV1C474KBV	0.47	
	C179	ECUV1C474KBV	0.47	
	C180	ECUV1C474KBV	0.47	
	C181	ECUV1C474KBV	0.47	
	C182	F1G1H2R7A480	2.7p	
	C183	F1H0J4750002	4.7	
	C184	ECUE1H100DCQ	10p	
	C185	ECUE1H102KBQ	0.001	
	C186	ECUE1H101JCQ	100p	
	C187	ECUE1H101JCQ	100p	
	C188	ECUE0J105KBQ	1	
	C340	F1J0J2260004	22	
	C802	F1G1H2R4A480	2.4p	
	C803	F1G1H1R8A480	1.8p	
	C804	F1G1H2R4A480	2.4p	
	C807	F1G1H2R2A480	2.7p	
	C808	ECUE1A104KBQ	0.1	
	C809	ECUE1H100DCQ	10p	
	C810	F1G1H2R7A480	1.8p	
	C811	ECUE1H100DCQ	10p	
	C813	ECUE1H1R0BCQ	1	
	C814	ECUE1H332KBQ	0.0033	
	C815	ECUE1H1R5BCQ	1.5	
	C819	ECUE1H100DCQ	10p	
	C820	F1G1HR50A480	0.5p	
	C822	ECUE1H101JCQ	100p	
	C825	ECUE1H100DCQ	10p	
	C826	F1G1H2R2A480	1.2p	
	C832	F1G1H7R0A480	7p	
	C834	F1G1HR50A480	0.5p	
	C840	F1G1H1R8A480	1.8p	
	L804	F1G1H1R2A480	1.2p	
	L122	F1G1H1R8A480	1.8p	
			(OTHERS)	
	MIC100	L0CBAY000016	MICROPHONE	
	E101	L5DZBYY00013	LIQUID CRYSTAL DISPLAY (*3)	
	E102	PQHR11279Z	TRANSPARENT PLATE, LCD	PMMA-HB
	E103	PNHR1006Z	GUIDE, LCD	ABS-HB
	E104	PNHX1004Z	COVER, LCD	
	E105	PQJE10179V	LEAD WIRE, FPC	
	E106	B3AFB0000211	LED	
	E107	PQWE10050Z	BATTERY TERMINAL	
	E108	PNMC1003Z	CASE, MAGNETIC SHIELD	
	X1	H0J103500033	CRYSTALOSCILLATOR(*1)	

15.5.3. Charger Unit

15.5.3.1. Cabinet and Electrical Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	200	PNLC1001YT	CHARGER UNIT ASS'Y with NAME PLATE (RTL)	
	200-1	PNKM1015Y2	CABINET BODY	PS-HB
	200-2	PNJT1010Z	CHARGE TERMINAL	
	200-3	PNKF1012Z1	CABINET COVER	PS-HB
	200-4	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	
	200-5	PNGT1728Z	NAME PLATE (for KX-TG9471B)(for KX-TG9472B)	
	200-5	PNGT1044Y	NAME PLATE (for KX-KXTGA939T)	

15.5.3.2. Main P.C.Board Parts

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

15.5.4. Accessories and Packing Materials

Note:

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

15.5.4.1. KX-TG9471B

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	A1	PQLV219Y	AC ADAPTOR	
	A2	PQJA10075Z	CORD, TELEPHONE (2-wire)	
	A3	PQJA10088Z	CORD, TELEPHONE (4-wire)	
	A4	PNJA1081Z	CORD, USB	
	A5	PQJA212V	CORD, HANDSET	
	A6	PNLXP1010Z	HANDSET	
	A7	PNKE1004Z1	HANGER, BELT CLIP	ABS-HB
	A8	PNQX3179Z	INSTRUCTION BOOK (*1)	
	A9	PNQW2754Z	LEAFLET, QUICK GUIDE (for English)	
	A10	PNJX1009Z	CD-ROM	
	P1	PNPK3426001Z	GIFT BOX	
	P2	PNPD1549Z	CUSHION	

15.5.4.2. KX-TG9472B

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	A101	PQLV219Y	AC ADAPTOR	
	A102	PQJA10075Z	CORD, TELEPHONE (2-wire)	
	A103	PQJA10088Z	CORD, TELEPHONE (4-wire)	
	A104	PNJA1081Z	CORD, USB	
	A105	PQJA212V	CORD, HANDSET	
	A106	PNLXP1010Z	HANDSET	
	A107	PNKE1004Z1	HANGER, BELT CLIP	ABS-HB
	A108	PNQX3179Z	INSTRUCTION BOOK (*1)	
	A109	PNQW2754Z	LEAFLET, QUICK GUIDE (for English)	
	A110	PNJX1009Z	CD-ROM	
	P101	PNPK3427001Z	GIFT BOX	
	P102	PNPD1550Z	CUSHION	

15.5.4.3. KX-TGA939T

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	A201	PQLV219Z	AC ADAPTOR	
	A202	PNQX1455W	INSTRUCTION BOOK (*1)	
	A203	PNKE1004Z1	HANGER, BELT CLIP	ABS-HB
	P201	PNPK1513Z	GIFT BOX	

15.5.5. Screws

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

15.5.6. Fixtures and Tools

Note:

(*1) See **Equipment Required** (P.56), and **The Setting Method of JIG (Portable)** (P.60).

(*2) When replacing the Base unit and Portable LCD, See **Assembly Instructions** (P.53).

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
		PQZZ1CD300E	JIG CABLE (*1)	
		PNZZTG9471B	BATCH FILE CD-ROM (*1)	
		PQZZ430PIR	TIP OF SOLDERING IRON (*2)	
		PQZZ430PRB	RUBBER OF SOLDERING IRON (*2)	