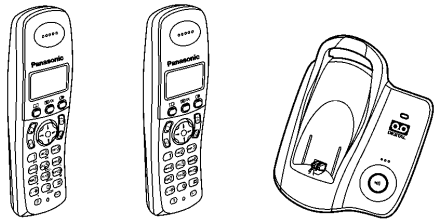
ORDER NO. KM40503650CE

Service Manual

Telephone Equipment

Caller ID and SMS Compatible



KX-TCA122EXT (HANDSET) KX-TCA121EXT (HANDSET) KX-TCD220SLT (BASE UNIT)

- **The difference between KX-TCA122 and KX-TCA121**
  KX-TCA122 has the icons for answering system printed below the dial keys.

(CHARGER UNIT)

Configuration for each model

Model No	Base Unit	Handset	Charger Unit
KX-TCD220	1	1 (TCA122)	
KX-TCA121		1 (TCA121)	1

KX-TCA121 is an optional accessory, which contains a handset and a charger.

KX-TCD220SLT
KX-TCA122EXT
KX-TCA121EXT

Digital Cordless Answering System

Titanium Black Version

(for Switzerland)

SPECIFICATION

Standard:	DECT (Digital Enhanced Cordless Telecommunications) GAP (Generic Access Profile)
Number of channels:	120 Duplex Channels
Frequency range:	1.88 GHz to 1.9 GHz
Duplex procedure:	TDMA (Time Division Multiple Access)
Channel spacing:	1728 kHz
Bit rate:	1152 kbit/s
Modulation:	GFSK (Gaussian Frequency Shift Keying)
RF Transmission power:	Approx. 250 mW
Voice coding:	ADPCM 32 kbit/s
Operation range:	Up to 300 m outdoors, Up to 50 m indoors
Analog telephone connection:	Telephone Line

Power source:	AC Adaptor (220 V - 240 V AC, 50 Hz)
Power consumption, Base Unit: Charger Unit:	 Standby: Approx. 3.5 W/Maximum: Approx. 9.2 W Standby: Approx. 2.3 W/Maximum: Approx. 6.8 W
Battery life, Handset (if batteries are fully charged):	Stand-by: Up to 170 hours (Ni-MH) Talk: Up to 16 hours (Ni-MH)
Operating conditions:	5 ˚C - 40 ˚C, 20 % - 80 % relative air humidity (dry)
Dimensions, Base Unit (D x W x L):	Approx. 111 mm x 121 mm x 123 mm
Dimensions, Handset (D x W x L):	Approx. 148 mm x 48 mm x 32 mm
Dimensions, Charger Unit (D x W x L):	Approx. 85 mm x 94 mm x 65 mm
Mass (weight), Base Unit:	Approx. 210 g
Mass (weight), Handset:	Approx. 130 g
Mass (weight), Charger Unit:	Approx. 90 g

Specifications are subject to change.
The illustrations used in this manual may differ slightly from the actual product.

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.

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.

When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.

Note:

Because CONTENTS 4 to 11 are the extracts from the Operating Instructions of this model, they are subject to change without notice. Please refer to the original Operating Instructions for further information.

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1 ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:

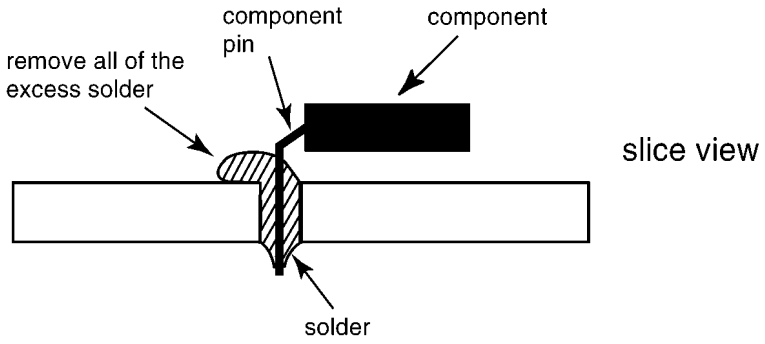
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

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 although, with some precautions, standard Pb solder can also be used.

Caution

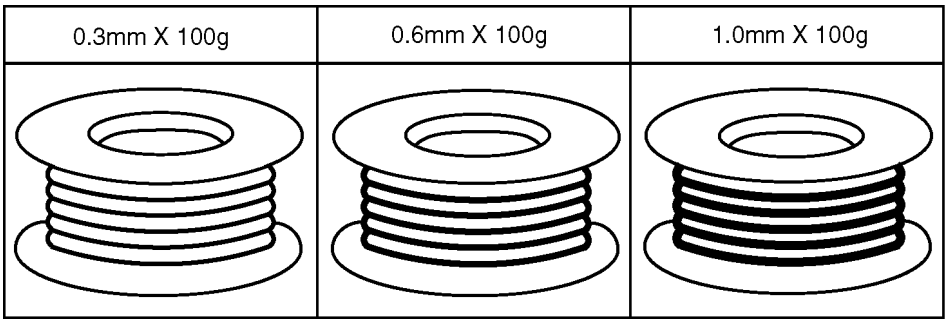
- PbF solder has a melting point that is 50°F ~ 70°F (30°C ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700°F ± 20°F (370°C ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.
- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F (600°C).
- If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.
- 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).



1.1. Suggested PbF Solder

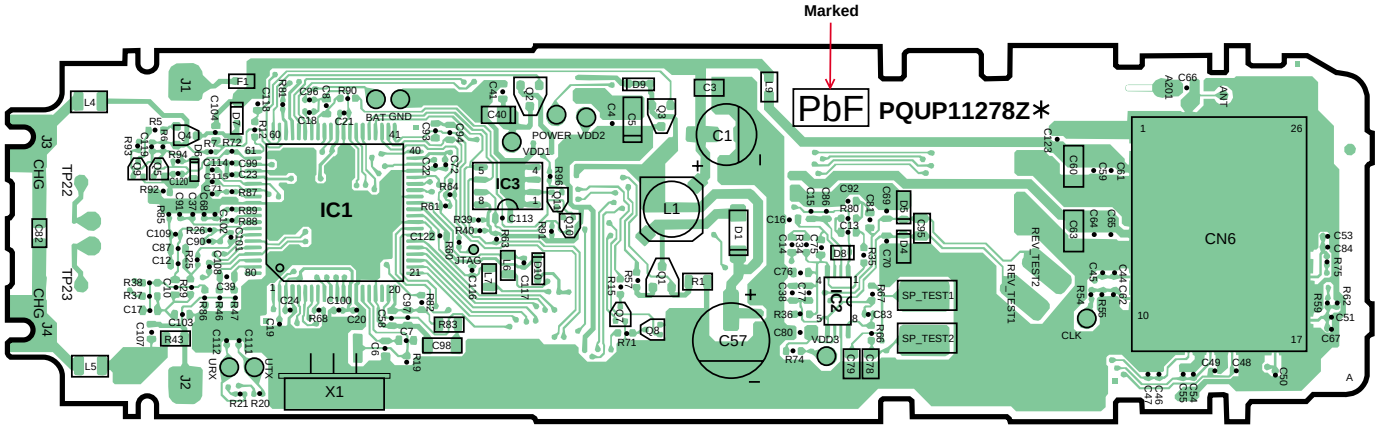
There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper (Sn+Ag+Cu), you can also use Tin and Copper (Sn+Cu) or Tin, Zinc, and Bismuth (Sn+Zn+Bi). Please check the manufacturer's specific instructions for the melting points of their 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: 0.3mm, 0.6mm and 1.0mm.



1.2. How to Recognize that Pb Free Solder is Used

(Example: Handset P.C.B.)



(Component View)

Note:

The location of the “PbF” mark is subject to change without notice.

2 FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help prevent recurring malfunctions.

1. Cover the plastic parts boxes with aluminum foil and ground them.
2. Ground the soldering irons.
3. Use a conductive mat on the worktable.
4. Do not touch IC or LSI pins with bare fingers.

3 CAUTION

1. Danger of explosion if battery is incorrectly replaced.
2. Replace only with the same or equivalent type recommended by the manufacturer.
3. Dispose of used batteries according to the manufacture’s Instructions.

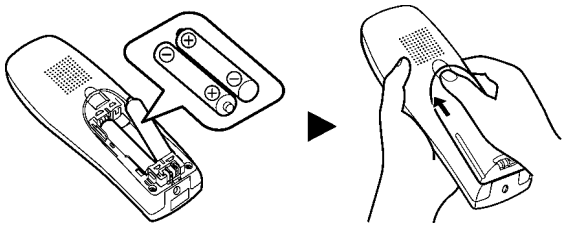
4 BATTERY

4.1. Battery Installation

1. Insert the batteries negative (⊖) terminal first.
2. Close the handset cover.

Note:

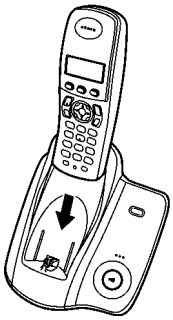
- Use only rechargeable Ni-MH batteries P03P (HHR-4EPT).

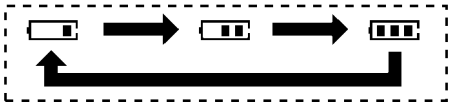


4.2. Battery Charge

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

When charging, the battery icon is shown as follows. When the batteries are fully charged, remains on the display.





Battery icon	Battery strength
	High
	Medium
	Low When flashing: Needs to be charged.

Note:

- It is normal for the handset to feel warm during charging.
- It takes 7 hours to fully charge the batteries, however, you can use the handset before the batteries are fully charged.
- Clean the charge contacts of the handset and base unit with a soft, dry cloth, otherwise the batteries may not charge properly. Clean if the unit is exposed to grease, dust or high humidity.
- When flashes, recharge the handset batteries. will continue to flash until the batteries have been charged for at least 15 minutes.
- If the handset is turned off, it will be turned on automatically when it is placed on the base unit.

4.3. Battery Life

After your Panasonic batteries are fully charged, you can expect the following performance:

Ni-MH batteries (700 mAh)

Operation	Operating Time
While in use (talking)	20 hours max.
While not in use (standby)	170 hours max.

Note:

- Actual battery performance depends on a combination of how often the handset is in use (talking) and how often it is not in use (standby).
- Battery operating time may be shortened over time depending on usage conditions and ambient temperature.

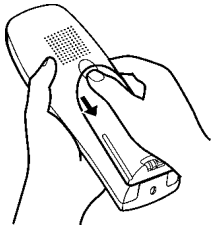
4.4. Battery Replacement

If flashes even after the handset batteries have been charged for 7 hours, the batteries must be replaced.

Important:

- We recommend the use of Panasonic rechargeable Ni-MH batteries P03P (HHR-4EPT). If you install non-rechargeable batteries and start charging, the batteries may leak electrolyte.
- Do not mix old and new batteries.

1. Press the notch on the handset cover firmly and slide it in the direction of the arrow.



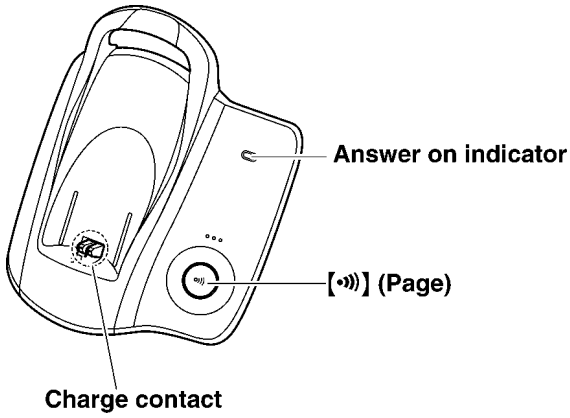
2. Remove the old batteries positive (⊕) terminal first and install the new ones.

Note for Service:

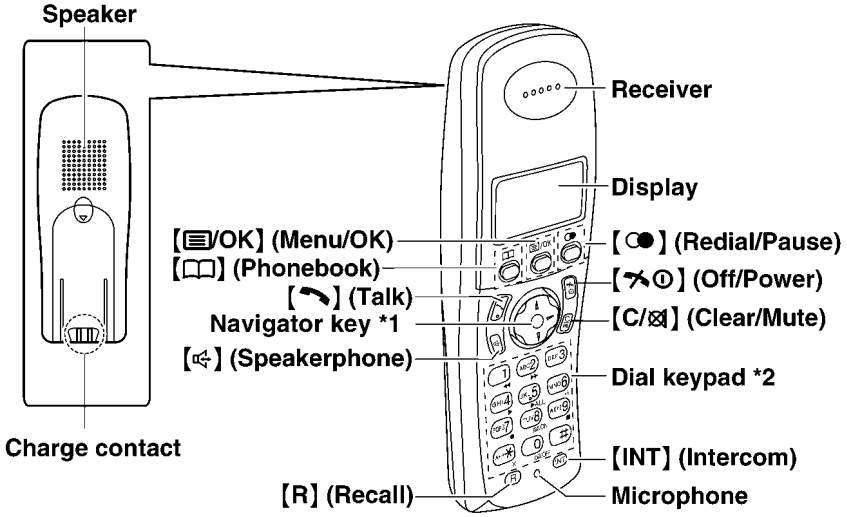
- You could use other rechargeable batteries on sale, but the unit is not guaranteed to work properly.

5 LOCATION OF CONTROLS

5.1. Base Unit



5.2. Handset



Model shown is KX-TCA122.

*1 【▲】【▼】: To search for the desired item in menus.
【▶】: To select the desired item or move the cursor to the right.
【◀】: To return to the previous screen or move the cursor to the left.

*2 The icons printed below the dial keys shown in the illustration (▶, , ■ etc.) indicate answering system operations.

Note:

- Up to 3 menu items can be displayed at a time. To select a menu item not shown on the current page, scroll up or down by pressing the navigator key, 【▲】 or 【▼】, respectively.

6 SETTINGS

Important Information

General

- Use only the AC adaptor included with this product.
- Do not connect the AC adaptor to any AC outlet other than a standard 220 - 240 V AC outlet.
- This product is unable to make calls when:
  - The portable handset battery(ies) need recharging or have failed.
  - There is a power failure.
  - The key lock feature is turned on.
  - The call bar feature is turned on (only phone numbers stored in the unit as emergency numbers can be called).
- Do not open the base unit or handset other than to replace the battery(ies).
- This product should not be used near emergency/intensive care medical equipment and should not be used by people with pacemakers.
- Care should be taken that objects do not fall onto, and liquids are not spilled into, the unit. Do not subject this product to excessive smoke, dust, mechanical vibration or shock.

Environment

- Do not use this product near water.
- This product should be kept away from heat sources such as radiators, cookers, etc. It should also not be placed in rooms where the temperature is less than 5 °C or greater than 40 °C.
- The AC adaptor is used as the main disconnect device. Ensure that the AC outlet is installed near the unit and is easily accessible.

Warning:

- To prevent the risk of electrical shock, do not expose this product to rain or any other type of moisture.

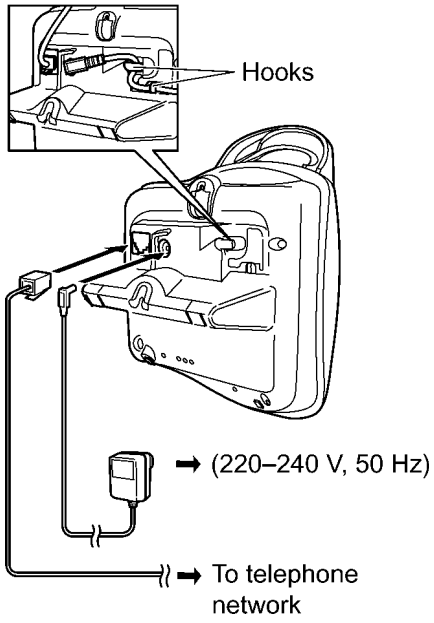
Location

- For maximum distance and noise-free operation, place your base unit:
  - Away from electrical appliances such as TVs, radios, personal computers or other phones.
  - In a convenient, high, and central location.

6.1. Connections

6.1.1. Base Unit

When the AC adaptor is connected, a short beep will be heard. If it is not heard, check the connections.



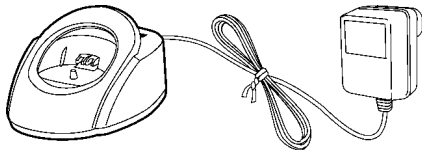
Important:

- Use only the AC adaptor PQLV19CEX and telephone line cord supplied with this unit.

Note:

- After connection, you must charge the batteries to make or answer calls.
- Never install telephone wiring during a lightning storm.
- The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)
- The AC adaptor should be connected to a vertically oriented or floor-mounted AC outlet. Do not connect the AC adaptor to a ceiling-mounted AC outlet, as the weight of the adaptor may cause it to become disconnected.

6.1.2. Charger Unit



Important:

- Use only the AC adaptor PQLV200CEX.

Note:

- The AC adaptor must remain connected at all times (It is normal for the adaptor to feel warm during use).

6.2. Guide to Settings

For your reference, a chart of all items which can be customised for the base unit and the handset is printed below.

・When customising the base unit and the handset, the current item or setting is indicated by ▶.

6.2.1. Base Unit

Settings menu	Sub-menu	Sub-menu 2	Default setting	Remarks (selectable options)
Ringer Setup	Ringer Volume		Medium	Off/Low/Medium/High
	Night Mode	Start/End	23:00/06:00	—
		On/Off	Off	On/Off
		Ring Delay	60 sec.	30/60/90/120 sec and No Ringing
Call Options	Dial Mode		Tone	Tone/Pulse
	Recall		600 msec.	80/90/100/110/160/200/250/ 300/400/600/700/900 msec
	Pause Length		3 sec.	3 sec/5 sec
	Emergency No.		—	—
	Call Restrict		—	—
Other Options	Base Unit PIN		0000	—
	Repeater Mode		Off	On/Off
	Reset Base		—	—

Note:

・Up to 3 menu items can be displayed at a time. To select a menu item not shown on the current page, scroll up or down by pressing the navigator key, 【▲】 or 【▼】, respectively.

SMS settings

SMS settings	Default setting	Remarks (selectable options)
SMS on/off	Off	On/Off
Message Centre 1	—	—
Message Centre 2	—	—
PBX line access number	Delete All	—

Note:

・If the base unit is reset to its default settings, the contents of the receive and send lists will be erased.

Answering system settings

Answering system setting	Default setting	Remarks (selectable Options)
Answering system on/off	Answer On	On/Off
Voice guidance language	German	German/French
Remote access code	Delete (Off)	000~999/Off (✱)
Number of rings	4 Rings	Auto/2-7 Rings
Caller's recording time	3 Minutes	Greeting Only/1 min./3 min.
Call screening	On	On/Off
Message alert	Off	On/Off

6.2.2. Handset

Settings menu	Sub-menu	Sub-menu 2	Default setting	Remarks (selectable options)
Time Settings	Set Date & Time		—	—
	Alarm		Off	Once/Daily/Off
Ringer Setup	Ringer Volume		Maximum	Off/1 to 6
	Ext. Ringtone (External ringtone)		Ringtone 1	1 to 15
	Int. Ringtone (Intercom ringtone)		Ringtone 1	1 to 15
	Night Mode	Start/End	23:00/06:00	—
		On/Off	Off	On/Off
		Ring Delay	60 sec.	30/60/90/120 sec and No Ringing
		Select Category	—	—
Display Setup	Standby Display		Off	Base Number/Handset Nubmer/Off
	Select Language		Deutsch	—
	Contrast		Level 3	1 to 6
Call Options	Call Bar		Off	On/Off
	Auto Talk		Off	On/Off
Registration	Register H.set (Register handset)		—	—
Select Base	—		Auto	—
Other Options	Handset PIN		0000	—
	LetterWise		Deutsch	—
	Keytones		On	On/Off
	Reset Handset		—	—

Note:

・Up to 3 menu items can be displayed at a time. To select a menu item not shown on the current page, scroll up or down by pressing the navigator key, 【▲】 or 【▼】, respectively.

6.3. Ringer Volume

6.3.1. Base Unit

1 Press [☰/OK].
2 Select "**Base Unit Setup**", then press [▶].
3 Enter "0000" (default base unit PIN).
   • If you changed the PIN, enter it.
4 Select "**Ringer Setup**", then press [▶].
5 Select "**Ringer Volume**", then press [▶].
6 Press [▲] or [▼] repeatedly to select the desired volume.
7 Press [▶].
8 Press [⏻].

6.3.2. Handset

1 Press [☰/OK].
2 Select "**Handset Setup**", then press [▶].
3 Select "**Ringer Setup**", then press [▶].
4 Select "**Ringer Volume**", then press [▶].
5 Press [▲] or [▼] repeatedly to select the desired volume.
6 Press [▶].
7 Press [⏻].

Note:

・Alarms will sound and the handset will ring for intercom calls and when paged even if the ringer is turned off.

6.4. Night Mode

Night mode allows you to select a block of time during which the base unit and the handset will not ring for outside calls. This feature is useful for times when you do not want to be disturbed, for example, while sleeping. Night mode can be set independently for the handset and the base unit.

Using the phonebook's category feature, you can also select categories of callers whose calls will override night mode and ring the handset (Caller ID subscribers only). Set the date and time beforehand.

Note:

- When the call screening feature is on and the base unit answers a call, the greeting message and caller's messages will be heard from the handset speaker even if the night mode setting is on.

6.4.1. Turning Night Mode On/Off

6.4.1.1. Base Unit

1. Press **[☰/OK]**.
2. Select "**Base Unit Setup**", then press **[▶]**.
3. Enter "**0000**" (default base unit PIN).
   - If you changed the PIN, enter it.
4. Select "**Ringer Setup**", then press **[▶]**.
5. Select "**Night Mode**", then press **[▶]**.
6. Select "**On/Off**", then press **[▶]**.
7. Select "**On**" or "**Off**", then press **[▶]**.
8. Press **[⏻]**.

6.4.1.2. Handset

1. Press **[☰/OK]**.
2. Select "**Handset Setup**", then press **[▶]**.
3. Select "**Ringer Setup**", then press **[▶]**.
4. Select "**Night Mode**", then press **[▶]**.
5. Select "**On/Off**", then press **[▶]**.
6. Select "**On**" or "**Off**", then press **[▶]**.
7. Press **[⏻]**.

Note:

- When the night mode is turned on, "**[N]**" is displayed.

6.5. PIN Code

6.5.1. Base Unit

For security, the base unit PIN must be entered when changing certain settings. The default PIN is "0000".

1 Press [☰/OK].
2 Select "**Base Unit Setup**", then press [▶].
3 Enter "0000" (default base unit PIN).
   • If you changed the PIN, enter it.*
4 Select "**Other Options**", then press [▶].
5 Select "**Base Unit PIN**", then press [▶].
6 Enter the new 4-digit base unit PIN, then press [☰/OK].
7 Press [↶①].

For Service Hint:

*: If the current 4-digit Base Unit PIN is forgotten, follow the procedures below.

1. If Base Unit and Handset are not linked with, first, follow the steps in **Registering a Handset to a Base Unit** (P.26).
2. Follow the steps above in **Base Unit** (P.15) of PIN Code. At step 3, enter ✱7000 , and you will able to enter new Base Unit PIN.

6.5.2. Handset

For security, the handset PIN must be entered when changing certain settings. The default PIN is "0000".

1 Press [☰/OK].
2 Select "**Handset Setup**", then press [▶].
3 Select "**Other Options**", then press [▶].
4 Select "**Handset PIN**", then press [▶].
5 Enter the current 4-digit handset PIN.*
6 Enter the new 4-digit handset PIN, then press [☰/OK].
7 Press [↶①].

For Service Hint:

*: If the current 4-digit PIN is forgotten, press ✱7000 and you will be able to enter new Handset PIN.

This password is useful whether Base Unit and Handset are linked with or not.

6.6. Reset

6.6.1. Base Unit

1 Press 【▤/OK】.
2 Select "**Base Unit Setup**", then press 【▶】.
3 Enter "0000" (default base unit PIN).
- If you changed the PIN, enter it.

4 Select "**Other Options**", then press 【▶】.
5 Select "**Reset Base**", then press 【▶】.
6 Select "**Yes**", then press 【▶】.
7 Press 【↶⏻】.

Note:

- The following items will be deleted or reset to their default settings:
  - **Base Unit** (P.11) Settings
  - All SMS messages
  - Caller list
- The following items will be retained:
  - Date and time
  - Shared phonebook entries
  - Repeater mode
  - Recordings, including your greeting message, caller messages, voice memos and audible call announcements, and recorded conversations.

6.6.2. Handset

1 Press 【▤/OK】.
2 Select "**Handset Setup**", then press 【▶】.
3 Select "**Other Options**", then press 【▶】.
4 Select "**Reset Handset**", then press 【▶】.
5 Enter "0000" (default handset PIN).
- If you changed the PIN, enter it.

6 Select "**Yes**", then press 【▶】.
7 Press 【↶⏻】.

Note:

- The following items will be deleted or reset to their default settings:
  - **Handset** (P.12) Settings
  - Redial list
  - Voice enhancer
  - Category names
  - Category ringtones
- The following items will be retained:
  - Handset phonebook entries (category names and ringtones will be reset to their default settings.)
  - Date and time

6.7. Key Lock

The handset can be locked so that no calls or settings can be made. Incoming calls can be answered, but all other functions are disabled while key lock is on.

To turn key lock on, press **【▤/OK】** for about 2 seconds.

- "[X]" is displayed.
- To turn key lock off, press **【▤/OK】** for about 2 seconds.

Note:

- Calls to emergency numbers cannot be made until key lock is turned off.
- Key lock is turned off when the handset is turned off.

6.8. R Button to Use the Recall Feature

[R] is used to access optional telephone services. Contact your service provider for details.

Note:

- If your unit is connected to a PBX (private branch exchange), pressing **[R]** can allow you to access certain features of your host PBX such as transferring an extension call. Consult your PBX dealer for details.
- You can change the recall time.

6.9. Pause Button for PBX/Long Distance Service Users

A pause is sometimes required when making calls using a PBX or long distance service.

Example:

- If you have to dial **【0】** before dialling outside numbers manually, you will probably pause after dialling **【0】** until you hear a dial tone.

1. Press **【0】**.
2. Press **【○●】**.
3. Dial the phone number, then press **【↘】** or **【🔊】**.

Note:

- Pressing 【○●】 1 time creates 1 pause. Press 【○●】 repeatedly to create longer pauses.

6.10. Setting Call Restriction

You can restrict selected handsets from dialling certain numbers. You can assign up to 6 phone numbers to be restricted, and select which handsets will be restricted.

Storing area codes here will prevent the restricted handsets from dialling any phone number in that area code. If a restricted number is dialled, the call will not be connected and the restricted number will flash on the display.

1. Press **【▤/OK】**.
2. Select "**Base Unit Setup**", then press **【▶】**.
3. Enter "**0000**" (default base unit PIN).
   - If you changed the PIN, enter it.
4. Select "**Call Options**", then press **【▶】**.
5. Select "**Call Restrict**", then press **【▶】**.
6. Set which handsets will be restricted by pressing the desired handset number.
   - All the registered handset numbers will be displayed.
   - Flashing numbers indicate call restriction is turned on for the corresponding handset.
   - To turn call restriction off for a handset, press the number again. The number will stop flashing.
7. Press **【▤/OK】**.
8. Select a memory location, then press **【▶】**.
   - If the memory location already contains a restricted number, the number is displayed.
9. Enter the phone number or area code to be restricted (8 digits max.), then press **【▤/OK】**.
   - To erase a restricted number, press **【C/⊠】**.
10. Press **【↖⏻】**.

6.11. Turning Call BAR On/Off (Call Prohibition)

This feature prohibits making outside calls. When call bar is turned on, only intercom calls and calls to emergency numbers can be made.

1 Press 【▤/OK】.
2 Select "Handset Setup", then press 【▶】.
3 Select "Call Options", then press 【▶】.
4 Select "Call Bar", then press 【▶】.
5 Enter "0000" (default handset PIN).
   • If you changed the PIN, enter it.
6 Select "On" or "Off", then press 【▶】.
7 Press 【↶⏻】.

Note:

・When call bar is turned on, is displayed.

6.12. Changing the Display Language

1 Press 【▤/OK】.
2 Select "Handset Setup", then press 【▶】.
3 Select "Display Setup", then press 【▶】.
4 Select "Select Language", then press 【▶】.
5 Select the desired language, then press 【▶】.
6 Press 【↶⏻】.

Note:

• If you select a language you cannot read, follow the procedure bellow.
Press 【↶⏻】 ➧ Press 【▤/OK】 ➧ Press 【▲】 2 times ➧ Press 【▶】 ➧ Press 【▼】 2 times ➧
Press 【▶】 ➧ Press 【▼】 ➧ Press 【▶】 ➧ select the desired language ➧ Press 【▶】 ➧ Press 【↶⏻】.

6.13. Changing the Recall Time

Change the recall time, if necessary, depending on the requirements of your service provider or PBX.

1 Press 【▤/OK】.
2 Select "Base Unit Setup", then press 【▶】.
3 Enter "0000" (default base unit PIN).
   • If you changed the PIN, enter it.
4 Select "Call Options", then press 【▶】.
5 Select "Recall", then press 【▶】.
6 Select the desired setting, then press 【▶】.
7 Press 【↶⏻】.

6.14. ARS (Automatic Route Selection)

Different telephone carriers charge different rates for call to different areas. If you use different telephone carriers in an effort to save costs, automatic route selection can automatically dial the appropriate carrier code when you make calls to certain area codes according to the way you program this feature.

Important:

- To use automatic route selection, you must:
  - subscribe to the telephone carrier service you use
  - store the carrier codes you use
  - store the area codes you want to call using a specific carrier code
  - assign a carrier code to each stored area code

Contact your telephone carrier(s) for calling rates.

Example:

You have assigned carrier code “9876” to area code “123”. If you dial “123-4567”, the unit dials “9876-123-4567”.

Storing carrier codes for ARS (Turning ARS on)

Store the carrier codes of the telephone carriers you use. You can store up to 5 carrier codes.

1. Press **[▤/OK]**.
2. Select “**Base Unit Setup**”, then press **[▶]**.
3. Enter “0000” (default base unit PIN).
   - If you changed the PIN, enter it.
4. Select “**Call Options**”, then press **[▶]**.
5. Select “**ARS Settings**”, then press **[▶]**.
6. Select “**Carrier Code**”, then press **[▶]**.
7. Select “On”, then press **[▶]**.
8. Select a carrier code location (C1 to C5), then press **[▶]**.
   - If the location already contains a carrier code, the code is displayed.
9. Enter the carrier code (7 digits max.), then press **[▤/OK]**.
10. Press **[↖ⓘ]**.

Storing area codes for ARS

Store the area codes which should be dialled using a specific carrier. You can store up to 25 area codes.

1. Press **[▤/OK]**.
2. Select “**Base Unit Setup**”, then press **[▶]**.
3. Enter “0000” (default base unit PIN).
   - If you changed the PIN, enter it.
4. Select “**Call Options**”, then press **[▶]**.
5. Select “**ARS Settings**”, then press **[▶]**.
6. Select “**Area Code**”, then press **[▶]**.
7. Select an area code location (1 to 25), then press **[▶]**.
   - If the location already contains an area code, the code is displayed.
8. Enter an area code (5 digits max.), then press **[▤/OK]**.
9. Select a carrier code you stored (C1 to C5) earlier, then press **[▶]**.
   - This carrier code will be automatically dialled when you make a call to this area code.
10. Press **[↖ⓘ]**.

Turning ARS off

1. Press **[▤/OK]**.
2. Select “**Base Unit Setup**”, then press **[▶]**.
3. Enter “0000” (default base unit PIN).
   - If you changed the PIN, enter it.
4. Select “**Call Options**”, then press **[▶]**.
5. Select “**ARS Settings**”, then press **[▶]**.
6. Select “**Carrier Code**”, then press **[▶]**.
7. Select “**off**”, then press **[▶]**.
8. Press **[↖ⓘ]**.

7 DISPLAY

7.1. Display Icons

Various icons appear on the handset display to indicate the current status of the unit.

Display icon	Meaning	Display icon	Meaning
	Within range of a base unit ● When flashing: Handset is searching for base unit. (out of range of base unit, handset is not registered to base unit, no power on base unit)	[VE]	Voice enhancer is set to high or low tone.
		[N]	Night mode is on.
		[X]	Key lock is on.
	Handset is accessing base unit. (intercom, paging, changing base unit settings, etc.)	[2]	Handset number: The left icon shows handset 2 example.
	Handset is on an outside call.	-2-	Base unit number: The left icon shows base unit 2 example.
	Call bar is on.		
	Answering system is on.		New SMS message received (SMS users only)
	Battery strength	[IN USE]	Line is being used by another handset.

7.2. Caller ID Display

Important:

- This unit is Caller ID compatible. To use Caller ID features (such as displaying caller phone numbers), you must subscribe to Caller ID service. Consult your service provider for details.

Caller ID features

When an outside call is received, the caller's phone number can be displayed.

- Phone numbers of the last 50 different callers will be logged in the caller list.
- While listening to a message recorded by the answering system, you can call back the caller without having to dial the phone number.
- When caller information is received and it matches a phone number stored in the unit's phonebook:
  - The stored name will be displayed and logged in the caller list.
  - The handset will use the ringtone assigned to the caller's category.
  - The handset will announce the audible call recording you made.
- If the unit is connected to a PBX system, you may not receive the caller information.
- When the caller dialled from an area which does not provide Caller ID service, "Out of Area" will be displayed.
- When the caller requested not to send caller information, either no information or "Private Caller" will be displayed.

8 OPERATIONS

8.1. Turning the Power On/Off

Power on

Press 【⏻】 for about 1 second.

- The display will change to the standby mode.

Power off

Press 【⏻】 for about 2 seconds.

- The display will go blank.

8.2. Setting the Date and Time

Important:

- Confirm that the AC adaptor is connected.
- Ensure that 📡 is not flashing.

1. Press 【☰/OK】.
2. Select "`Handset Setup`", then press 【▶】.
3. Select "`Time Settings`", then press 【▶】.
4. Select "`Set Date & Time`", then press 【▶】.
5. Enter the current day, month and year by selecting 2 digits for each.
   Example: 17 May, 2005
   Press 【1】【7】【0】【5】【0】【5】.
6. Enter the current hour and minute by selecting 2 digits for each.
   - You can select "`AM`", "`PM`" or 24-hour time entry by pressing 【✳】 repeatedly.

   Example: 3:30 PM
   Press 【0】【3】【3】【0】, then press 【✳】 repeatedly until "`03:30 PM`" is displayed.
7. Press 【☰/OK】.
8. Press 【⏻】.

Note:

- To correct a digit, press 【◀】 or 【▶】 to move the cursor, then make the correction.
- The date and time may be incorrect after a power failure. In this case, set the date and time again.

8.3. Redialling

Previously dialled phone numbers (each 24 digits max.) can be redialled.

8.3.1. Making a Call Using the Redial List

The last 10 phone numbers dialled are stored in the redial list.

1. Press 【↻】.
   - The last number dialled will be displayed.
2. Press 【▲】 or 【▼】 repeatedly to select the desired number.
   - To exit the list, press 【⏻】.
3. Press 【📞】 or 【🔊】.
   - If 【🔊】 is pressed, the unit will redial automatically if the other party's line is engaged.

8.3.2. Redialling the Last Number Dialled

Press 【↻】, then press 【📞】 or 【🔊】.

- If 【🔊】 is pressed, the unit will redial automatically if the other party's line is engaged.

Note:

- You can also press 【📞】 or 【🔊】 before pressing 【↻】.

8.4. Phonebook

The phonebook allows you to make calls without having to dial manually. You can add 200 names and phone numbers to the phonebook, assign each phonebook entry to the desired category, and search for phonebook entries by name or category.

8.4.1. Adding Entries to the Phonebook

1. Press 【📖】, then press 【▤/OK】.
2. Select "`New Entry`", then press 【▶】.
3. Enter the party's name (16 characters max.), then press 【▤/OK】.
4. Enter the party's phone number (24 digits max.), then press 【▤/OK】.
5. Select the desired category for the entry, then press 【▶】.
6. Select "`Save`", then press 【▶】.
7. Press 【↩⏻】.

Note:

If there is no space to store new entries, "`Memory Full`" will be displayed. Erase unnecessary entries.

8.4.2. Available Character Entries

The dial keys are used to enter characters and numbers. Each dial key has multiple characters assigned to it.
The available character entry modes are, LetterWise®(*1), Alphabet, Numeric, Greek, Extended 1,Extended 2, and Cyrillic.
When in Alphabet (ABC), Greek (ΑΒΓ), Extended 1 (AÄÅ), Extended 2 (SŚŠ), or Cyrillic (АБВ) character entry modes, you can select which character is entered by pressing a dial key repeatedly.

- When the unit displays the character entry screen:
  - Press 【◀】 or 【▶】 to move the cursor.
  - Press dial keys to enter characters and numbers.
  - Press 【C/⌫】 to erase the character or number highlighted by the cursor. Press and hold 【C/⌫】 to erase all characters or numbers.
  - Press 【✳】 to switch between uppercase and lowercase.
  - To enter another character located on the same dial key, press 【▶】 to move the cursor to the next space, then press the appropriate dial key. (This is not necessary when entering text in LetterWise mode.)

Note:

(*1) Eatoni and LetterWise are trademarks of Eatoni Ergonomics, Inc.

Character entry modes

Several character entry modes are available. When the unit displays the character entry screen, press 【📖】, then select a character entry mode, and press 【▶】. The default mode is Alphabet.

LetterWise character table (for English)

LetterWise is a simplified text entry system which suggests the most likely letter to follow the previously entered text. Text can be input faster because the number of key presses are reduced. You can change which language is used for LetterWise character entry.

- Each time you press a dial key, LetterWise will suggest a character. If the suggested character is incorrect, press 【#】 repeatedly to display the desired character.

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
Space 0	Space # & ' ( ) ✳ , - . / 1	A B C 2	D E F 3	G H I 4	J K L 5	M N O 6	P Q R S 7	T U V 8	W X Y Z 9
		a b c 2	d e f 3	g h i 4	j k l 5	m n o 6	p q r s 7	t u v 8	w x y z 9

Alphabet character table (ABC)

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
Space 0	Space # & ' ( ) ✳ , - . / 1	A B C 2	D E F 3	G H I 4	J K L 5	M N O 6	P Q R S 7	T U V 8	W X Y Z 9
		a b c 2	d e f 3	g h i 4	j k l 5	m n o 6	p q r s 7	t u v 8	w x y z 9

Numeric Entry Table (0-9)

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
0	1	2	3	4	5	6	7	8	9

Greek Character Table (АВГ)

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
Space 0	Space # & ' ( ) ∗ , - . / 1	A B Γ 2	Δ E Z 3	H Θ I 4	K Λ M 5	N Ξ O 6	Π P Σ 7	T Y Φ 8	X Ψ Ω Ϋ 9

Extended 1 Character Table (AÄÅ)

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
Space 0	Space # & ' ( ) ∗ , - . / 1	A À Á Â Ã Ä Å Æ B C Ç 2	D E È É Ê Ë Ē F 3	G Ğ H I Ì Í Î Ï Ī İ Ǐ 4	J K L 5	M N Ñ O Ò Ó Ô Õ Ö ø 6	P Q R S Ș ß 7	T U Ù Ú Û Ü Ũ V 8	W Ŵ X Y ŷ Z 9
		a à á â ã ä å æ b c ç 2	d e è é ê ë ē f 3	g ğ h i ì í î ï ī ı ǐ 4	j k l 5	m n ñ o ò ó ô õ ö ø 6	p q r s ș ß 7	t u ù ú û ü ũ v 8	w Ŵ x y ŷ z 9

- The following are used for both uppercase and lowercase:

  ø Ș Ŵ ŷ

Extended 2 Character Table (SŚŠ)

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
Space 0	Space # & ' ( ) ∗ , - . / 1	A Á Ä Ą B C Ć Č 2	D Ď E É Ę Ě F 3	G H I Í 4	J K L Ł Ĺ Ľ 5	M N Ń Ň O Ó Ö Ő 6	P Q R Ŕ Ř S Ś Š 7	T Ť U Ú Ü Ű ů V 8	W X Y ỳ Ý Z Ź Ż Ž 9
		a á ä ą b c ć č 2	d ď e é ę ě f 3	g h i í 4	j k l ł ĺ ľ 5	m n ń ň o ó ö ő 6	p q r ŕ ř s ś š 7	t ť u ú ü ű ů v 8	w x y ỳ ý z ź ż ž 9

- The following are used for both uppercase and lowercase:

  Ą Ć Č Ę Ł Ĺ Ľ Ń Ŕ Ś Š ů ỳ Ź Ż Ž

Cyrillic Character Table (АБВ)

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
Space 0 Ґ Є І Ї Ў	Space # & ' ( ) ∗ , - . / 1	А Б В Г 2	Д Е Ж З 3	И Й К Л 4	М Н О П 5	Р С Т У 6	Ф Х Ц Ч 7	Ш Щ Ъ Ы 8	Ь Э Ю Я 9

8.4.3. Editing Entries in the Phonebook

Phonebook entries can be edited after you have saved them. You can change the name, phone number, and category.

Changing a name, phone number, category

1 Find the desired entry, then press **[▤/OK]**.
2 Select "**Edit**", then press **[▶]**.
3 Edit the name if necessary (16 characters max.), then press **[▤/OK]**.
4 Edit the phone number if necessary (24 digits max.), then press **[▤/OK]**.
5 Select the desired category, then press **[▶]**.
6 Select "**Save**", then press **[▶]**.
7 Press **[⏻]**.

8.4.4. Erasing Entries from the Phonebook

Erasing an entry

1 Find the desired entry, then press **[▤/OK]**.
2 Select "**Erase**", then press **[▶]**.
3 Select "**Yes**", then press **[▶]**.
4 Press **[⏻]**.

Erasing all entries

1 Press **[📖]**, then press **[▤/OK]**.
2 Select "**Erase All**", then press **[▶]**.
3 Select "**Yes**", then press **[▶]**.
4 Select "**Yes**" again, then press **[▶]**.
5 Press **[⏻]**.

8.4.5. Storing a Number from the Caller List into the Phonebook

1 Press **[▤/OK]**.
2 Select "**Caller List**", then press **[▶]**.
3 Press **[▲]** or **[▼]** repeatedly to display the desired entry, then press **[▤/OK]**.
4 Select "**Add Phonebook**", then press **[▶]**.
5 Continue from step 3 of "**Adding Entries to the Phonebook**".

Cross Reference:

Adding Entries to the Phonebook (P.22)

8.4.6. Storing a Number from the Redial List into the Phonebook

1 Press **[↻]**.
2 Press **[▲]** or **[▼]** repeatedly to select the desired number, then press **[▤/OK]**.
3 Select "**Add Phonebook**", then press **[▶]**.
4 Enter a name (16 characters max.), then press **[▤/OK]**.
5 Edit the phone number if necessary, then press **[▤/OK]**.
6 Select the desired category, then press **[▶]**.
7 Select "**Save**", then press **[▶]**.
8 Press **[⏻]**.

8.4.7. One Touch Dial

Assigning an Entry in the Phonebook to a One Touch Dial Key

Dial keys 【1】 to 【9】 can each be used as a one touch dial key, allowing you to dial a number from the phonebook by simply pressing a dial key.

1. Find the desired entry, then press 【▤/OK】.
2. Select "One Touch Dial", then press 【▶】.
3. Press 【▲】 or 【▼】 to select the desired dial key number, then press 【▶】.
   - When the dial key is already used as a one touch dial key, "∗" is displayed next to the dial key number. If you select this dial key, "Overwrite" is displayed. You can overwrite the previous assignment if necessary.
   - If you do not wish to overwrite, select "Go Back".
4. Select "Save", then press 【▶】.
5. Press 【⏻】.

Making a Call Using a One Touch Dial Key

1. Press and hold the desired one touch dial key (【1】 to 【9】).
   - You can view other one touch dial assignments by pressing 【▲】 or 【▼】.
2. Press 【📞】 or 【🔊】.

Erasing a One Touch Dial Assignment

1. Press and hold the desired one touch dial key (【1】 to 【9】).
2. Press 【▤/OK】, then press 【▶】.
3. Select "Yes", then press 【▶】.

Note:

Only the one touch dial assignment is erased. The corresponding phonebook entry is not erased.

8.4.8. Copying Phonebook Entries to Other Handsets

Phonebook entries can be copied from the handset to the phonebook of a compatible Panasonic handset.

Copying One Entry

1. Find the desired handset phonebook entry, then press 【▤/OK】.
2. Select "Copy", then press 【▶】.
3. Enter the handset number you wish to send the handset phonebook entry to.
4. To continue copying another entry, select "Yes", then press 【▶】. Find the desired handset phonebook entry, then press 【▶】.
   - To finish copying, select "No", then press 【▶】.
5. Press 【⏻】.

Copying All Entries

1. Press 【📖】, then press 【▤/OK】.
2. Select "Copy All", then press 【▶】.
3. Enter the handset number you wish to send the handset phonebook entries to.
   - When all entries have been copied, "Completed" is displayed.
4. Press 【⏻】.

Note:

- If the other handset (the receiver) is not in standby mode, "Failed" is displayed on your handset (the sender).
- If copying failed after copying at least 1 entry, "Incomplete" is displayed on your handset (the sender).

8.5. Registering a Handset to a Base Unit

To Register an Additional Handset to a Base Unit (Easy Registration)

The included handset and base unit are preregistered. After purchasing an additional handset, register it to the base unit. Ensure that the additional handset is switched on. If it is not on, press and hold 【⏻】 for few seconds to turn the handset on.

1. Lift the additional handset and press 【⏻】 to put the handset in standby mode.
2. Press and hold 【📡】 on the base unit for about 3 seconds, until the registration tone sounds.
3. Place the additional handset on the base unit. The registration tone continues to sound.
   With the handset still on the base unit, wait until a confirmation tone sounds and 📶 stops flashing.

Note:

- If an error tone sounds, or if 📶 is still flashing, register the handset manually (manual registration).
- If all registered handsets start ringing in step 2, press 【📡】 to stop. Start again from step 1.
- Charge the batteries of your additional handset for about 7 hours before initial use.
- This registration method cannot be used for handsets that have already been registered to a base unit. Register the handset manually (manual registration).

To Register a Handset to an Additional Base Unit (Manual Registration)

You can register a handset to a base unit manually using the following method.

1. Press 【☰/OK】.
2. Select "**Handset Setup**", then press【▶】.
3. Select "**Registration**", then press 【▶】 2 times.
4. Select a base unit number, then press 【▶】.
   - This number is used by the handset as a reference only.
5. Press and hold 【📡】 on the base unit for about 3 seconds, until the registration tone sounds.
   - If all registered handsets start ringing, press 【📡】 to stop, then repeat this step.
   - After pressing 【📡】, the rest of this procedure must be completed within 1 minute.
6. Wait until "**Enter Base PIN**" is displayed, then enter "**0000**" (default base unit PIN), then press 【☰/OK】.
   - If you changed the PIN, enter it.
   - When the handset has been registered successfully, 📶 will stop flashing. If keytones are turned on, a confirmation tone will be heard.

8.5.1. Cancelling a Handset

A maximum of 6 handsets can be registered to a base unit. A handset can cancel its own registration (or the registration of another handset) that is stored in the base unit. This will allow the base unit to "forget" the handset.

1. Press 【☰/OK】.
2. Select "**Base Unit Setup**", then press 【▶】.
3. Enter "**0000**" (default base unit PIN).
   - If you changed the PIN, enter it.
4. Enter "**335**".
5. Select "**Cancel Handset**", then press 【▶】.
   - The numbers of all handsets registered to the base unit are displayed.
6. Select the handset(s) you want to cancel, by pressing the desired handset number.
   - The selected handset number(s) will flash.
   - To cancel a selected handset number, press the number again. The number will stop flashing.
7. Press 【☰/OK】.
8. Select "**Yes**", then press 【▶】.
9. Press 【⏻】.

8.5.2. Cancelling a Base Unit

A handset can be registered to a maximum of 4 base units. A handset can cancel a base unit that it is registered to. This allows the handset to “forget” the base unit.

1 Press **[▤/OK]**.
2 Select “**Handset Setup**”, then press **[▶]**.
3 Select “**Registration**”, then press **[▶]**.
4 Enter “335”.
5 Select “**Cancel Base**”, then press **[▶]**.
6 Enter “0000” (default handset PIN).
- If you changed the PIN, enter it.

7 Select the base unit(s) you want to cancel, by pressing the desired base unit number.
- The selected base unit number(s) will flash.
- To cancel a selected base unit number, press the number again. The number will stop flashing.

8 Press **[▤/OK]**.
9 Select “**Yes**”, then press **[▶]**.
10 Press **[⏻]**.

Note:

To register the handset to another base unit or to the same base unit again, see manual registration.

8.6. Selecting a Base Unit

When “Auto” is selected, the handset will automatically use any available base unit it is registered to. When a specific base unit is selected, the handset will make and receive calls using that base unit only. If the handset is out of range of that base unit, no calls can be made.

1 Press **[▤/OK]**.
2 Select “**Handset Setup**”, then press **[▶]**.
3 Select “**Select Base**”, then press **[▶]**.
4 Select the desired base unit number, or “**Auto**”, then press **[▶]**.
- The handset starts search for the base unit.

9 SMS (Short Message Service)

SMS allows you to send and receive text messages between other fixed-line and mobile phones that support compatible SMS networks and features.

Messages can be forwarded by your SMS provider to fax machines and e-mail address.

Important:

- To use SMS features, you must:
  - subscribe to the Caller ID and/or appropriate service
  - confirm SMS is turned on
  - confirm the correct message centre numbers are stored

  Consult your service provider for details and availability.

Note:

- A total of 47 messages (at 160 characters/message) can be saved. Total number may be more than 47 if length of messages are less than 160 characters/message.
- If the unit is connected to a PBX system, you may not be able to use SMS features.

9.1. Writing and Sending a New Message

1. Press **【▤/OK】**.
2. Select "SMS", then press **【▶】**.
3. Select "Create", then press **【▶】**.
   - If "▲Use Last Text?" is displayed, you can use the text from the last message you created by pressing **【▲】**.
4. Enter the message, then press **【▤/OK】**.
5. Enter the destination phone number (20 digits max.), then press **【▤/OK】**.
   - To send the message to a party saved in the handset phonebook, press **【📖】**, select the handset phonebook entry, then press **【▤/OK】** 2 times.
   - To send the message to a party logged in the caller list, press **【▲】** or **【▼】** repeatedly to select the party, then press **【▤/OK】** 2 times.
   - To send the message to a phone number logged in the redial list, press **【↻】** repeatedly to select the phone number, then press **【▤/OK】** 2 times.
6. To save the message, select "Yes", then press **【▶】**.
   - To send the message without saving it, select "No", then press **【▶】**.
7. To send the message, select "Send", then press **【▶】**.
   - To cancel sending, press **【✂⏻】**.

Note:

- This unit supports SMS messages of up to 612 characters, however, the maximum number of characters you can send or receive may be limited by your SMS service provider. Consult your SMS service provider for details.
- If your message contains over 160 characters, "**Long Message**" is displayed. Your service provider may treat long messages differently from other messages. Consult your service provider for details.
- "Invalid Number" is displayed if you try to send a message to a phone number saved in the phonebook, caller list, or redial list that is over 20 digits long.
- When sending a message, "Sending Message" is displayed momentarily, then "Transferring Message" is displayed.
- If your phone is connected to a PBX, store the PBX line access number.

9.2. Available Character Entries for SMS

The dial keys are used to enter characters and numbers. Each dial key has multiple characters assigned to it.
The available character entry modes are, LetterWise, Alphabet, Numeric, Greek, and Extended.
When in Alphabet (ABC), Greek (ΑΒΓ), or Extended (AÄÅ) character entry modes, you can select which character is entered by pressing a dial key repeatedly.

- When the unit displays the character entry screen:
- Press 【◀】or【▶】to move the cursor.
- Press dial keys to enter characters and numbers.
- Press 【C/⊠】to erase the character or number highlighted by the cursor. Press and hold 【C/⊠】to erase all characters or numbers.
- Press 【✳】to switch between uppercase and lowercase.
- To enter another character located on the same dial key, press 【▶】to move the cursor to the next space, then press the appropriate dial key. (This is not necessary when entering text in LetterWise mode.)

Character Entry Modes

Several character entry modes are available. When the unit displays the character entry screen, press 【📖】, then select a character entry mode, and press 【▶】. The default setting is Alphabet.

LetterWise Character Table for (for German)

LetterWise is a simplified text entry system which suggests the most likely letter to follow the previously entered text. Text can be input faster because the number of key presses are reduced. You can change which language is used for LetterWise character entry.

- Each time you press a dial key, LetterWise will suggest a character. If the suggested character is incorrect, press 【#】 repeatedly to display the desired character.

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
Space 0	Space . @ / : ; ✳ # + - 1 " ' , ! ¡ ? ¿ _ € £ $ ¥ ( ) [ ] { } & % \ ^ ~ | < > = ¤ §	A B C Ä À 2	D E F É 3	G H I 4	J K L 5	M N O Ö 6	P Q R S ß 7	T U V Ü 8	W X Y Z 9
		a b c ä à 2	d e f é 3	g h i 4	j k l 5	m n o ö 6	p q r s ß 7	t u v ü 8	w x y z 9

Alphabet Character Table (ABC)

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
Space 0	Space . @ / : ; ✳ # + - 1 " ' , ! ¡ ? ¿ _ € £ $ ¥ ( ) [ ] { } & % \ ^ ~ | < > = ¤ §	A B C 2	D E F 3	G H I 4	J K L 5	M N O 6	P Q R S 7	T U V 8	W X Y Z 9
		a b c 2	d e f 3	g h i 4	j k l 5	m n o 6	p q r s 7	t u v 8	w x y z 9

Numeric Entry Table (0-9)

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
0	1	2	3	4	5	6	7	8	9

Greek Character Table (ΑΒΓ)

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
Space 0	Space . @ / : ; ✳ # + - 1 " ' , ! ¡ ? ¿ _ € £ $ ¥ ( ) [ ] { } & % \ ^ ~ | < > = ¤ §	A B Γ 2	Δ E Z 3	H Θ I 4	K Λ M 5	N Ξ O 6	Π P Σ 7	T Y Φ 8	X Ψ Ω 9

Extended Character Table (AÄÅ)

0	1	ABC 2	DEF 3	GHI 4	JKL 5	MNO 6	PQRS 7	TUV 8	WXYZ 9
Space 0	Space . @ / : ; ✱ # + - 1 " ' , ! ¡ ? ¿ _ € £ $ ¥ ( ) [ ] { } & % \ ^ ~ | < > = ¤ §	A À Á Â Ã Ä Å Æ B C Ç 2	D E È É Ê Ë Ē F 3	G Ğ H I Ì Í Î Ï Ĩ İ 4	J K L 5	M N Ñ O Ò Ó Ô Õ Ö ø 6	P Q R S Ş ß 7	T U Ù Ú Û Ü Ũ V 8	W X Y Z 9
		a à á â ã ä å æ b c ç 2	d e è é ê ë ẽ f 3	g ğ h i ì í î ï ĩ ı 4	j k l 5	m n ñ o ò ó ô õ ö ø 6	p q r s ş ß 7	t u ù ú û ü ũ v 8	w x y z 9

- The following are used for both uppercase and lowercase:

  ø Ş

9.3. Sending a Saved Message

1. Press **[▤/OK]**.
2. Select "**SMS**", then press **[▶]**.
3. Select "**Send List**", then press **[▶]**.
4. To read a saved message, press **[▲]** or **[▼]** repeatedly to select the message, then press **[▤/OK]**.
   - Messages are displayed in chronological order and by destination phone number.
5. To send the message, press **[▤/OK]**, select "**Send**", then press **[▶]**.
6. Press and hold **[C/⊠]** to erase all numbers, then continue from step 5 of "**Writing and Sending a New Message**".

Cross Reference:

Writing and Sending a New Message (P.28)

9.4. Editing and Sending a Saved Message

1. Press **[▤/OK]**.
2. Select "**SMS**", then press **[▶]**.
3. Select "**Send List**", then press **[▶]**.
4. Press **[▲]** or **[▼]** repeatedly to select the message, then press **[▤/OK]**.
5. Press **[▤/OK]**, select "**Edit Message**", press **[▶]**, then continue from step 4 of "**Writing and Sending a New Message**".

Cross Reference:

Writing and Sending a New Message (P.28)

9.5. Erasing Saved Messages

1. Press **[▤/OK]**.
2. Select "**SMS**", then press **[▶]**.
3. Select "**Send List**", then press **[▶]**.
4. Press **[▲]** or **[▼]** repeatedly to select the message, then press **[▤/OK]**.
5. Press **[▤/OK]**, select "**Erase**", then press **[▶]**.
   - To erase all messages in the selected mailbox, select "**Erase All**", then press **[▶]**.
6. Select "**Yes**", then press **[▶]**.
7. Press **[⏻]**.

9.6. Receiving a Message

When an SMS message is received:

- a tone is heard (if the ringer is turned off, this tone is not heard)
- "Receiving SMS Message" is displayed
- ✉ is displayed

9.7. Reading a Received Message

1. Press **[☰/OK]**.
2. Select "**SMS**", then press **[▶]**.
3. Select "**Receive List**", then press **[▶]**.
4. Press **[▲]** or **[▼]** repeatedly to select a message.
   - Messages which have already been read are indicated by a "✓", even if they were read using another handset.
5. Press **[☰/OK]** to read the message content.

Note:

- To call the message sender, press **[📞]** or **[🔊]**.
- If "SMS Full" is displayed, new SMS messages cannot be received. Erase unnecessary messages.
- If you receive a message from a party saved in the handset phonebook, the stored name is displayed.
- Some SMS service providers attach a 1digit number to the message sender's phone number, and sender names stored in the handset phonebook may not be displayed as a result.

9.8. Replying to a Message

1. While reading a received message, press **[☰/OK]**.
2. Select "**Reply**", then press **[▶]**.
3. Enter a message, then press **[☰/OK]**.
4. Edit the destination phone number and/or press **[☰/OK]**, then continue from step 6 of "**Writing and Sending a New Message**".

Editing/Forwarding a Message

1. While reading a received message, press **[☰/OK]**.
2. Select "**Edit Message**", then press **[▶]**, then continue from step 4 of "**Writing and Sending a New Message**".

Cross Reference:

Writing and Sending a New Message (P.28)

9.9. Erasing Received Messages

1. While reading a received message, press **[☰/OK]**.
2. Select "**Erase**", then press **[▶]**.
   - To erase all messages in the selected mailbox, select "**Erase All**", then press **[▶]**.
3. Select "**Yes**", then press **[▶]**.
4. Press **[⏻]**.

9.10. Changing SMS Message Centre Numbers

SMS message centre telephone numbers must be stored in order to send and receive SMS messages.

The following numbers (used for SMS service provided by Cablecom) are pre programmed in this unit. You can change them if necessary.

- Message Centre 1: 0435375370

・Consult your service provider for more information.

1 Press 【▤/OK】.
2 Select "SMS", then press 【▶】.
3 Select "Settings", then press 【▶】.
4 Enter "0000" (default base unit PIN).
   ● If you changed the PIN, enter it.
5 Select "Message Centre1" or "Message Centre2", then press 【▶】.
6 Edit the number as necessary, then press 【▤/OK】.
7 Select "Save", then press 【▶】.
8 Press 【↶⏻】.

Note:

If your phone is connected to a PBX, you need to add the PBX line access number and a dialling pause to the beginning of the Message Centre 1 phone number. For Message centre 2, store the Message centre 1 phone number as is, without adding a line access number or dialling pause.

9.11. Turning SMS On/Off

The default setting is "On".

1 Press 【▤/OK】.
2 Select "SMS", then press 【▶】.
3 Select "Settings", then press 【▶】.
4 Enter "0000" (default base unit PIN).
   ● If you changed the PIN, enter it.
5 Select "SMS On/Off", then press 【▶】.
6 Select "On" or "Off", then press 【▶】.
7 Press 【↶⏻】.

Note:

・If you try to send a message while SMS is turned off, a tone sounds and the message is placed in the receive list with "FD" attached to it.

・If someone tries to send you a message while SMS is turned off, the message will not be received and the message centre number will be logged in the caller list.

10 Answering System

The unit contains an answering system which can answer and record calls for you when you are unavailable to answer the phone. You can also record your own voice memos and phone conversations.

Important:

- Only 1 handset can access the answering system (listen to messages, record a greeting message, etc.) at a time.
- When callers leave messages, the unit records the day and time of each message. Make sure the date and time have been set.

10.1. Turning the Answering System On/Off

1 Press **[▤/OK]**.
2 Select "**Answer System**", then press **[▶]**.
3 Select "**Answer On**" or "**Answer Off**", then press **[▶]**.
4 Press **[↶⏻]**.

Note:

- When the answering system is turned on:
  - ▭ is displayed
  - the answer on indicator on the base unit lights

10.2. Greeting Message

When the unit answers a call, callers are greeted by a greeting message. You can record your own greeting message or use a prerecorded greeting message.

10.2.1. Using a prerecorded greeting message

If you erase or do not record your own greeting message, the unit can play a prerecorded greeting message for callers and ask them to leave messages. If the message recording time is set to "**Greeting Only**", caller messages will not be recorded and the unit will play a different prerecorded greeting message asking callers to call again.

10.2.2. Playing back the greeting message

1 Press **[▤/OK]**.
2 Select "**Answer System**", then press **[▶]**.
3 Select "**Play Greeting**", then press **[▶]**.
4 Press **[↶⏻]**.

10.3. Listening to Message

Messages are stored and played back chronologically, from oldest message to newest.

10.3.1. Listening to new/all message

When you have new messages:
– the answer on indicator on the base unit flashes
– the total number of new messages is displayed
– the base unit beeps about once a minute if the message alert feature has been turned on

1 Press [▤/OK].
2 Select "Answer System", then press [▶].
3 Select "Play New Msg." or "Play All Msg.", then press [▶].

Note:
- To adjust the speaker volume during playback, press [▲] or [▼] repeatedly.
- After playing back all of the new messages, the answer on indicator will stop flashing but will remain lit up when the answering system is turned on.
- While listening to messages, you can switch between the receiver and speaker by pressing [📞] or [🔊].

10.3.2. Repeating, skipping, stopping, erasing a message during playback

- To repeat a message during playback, press [◀]. If pressed within the first 5 seconds of a message, the previous message will be played.
- To skip a message during playback, press [▶].
- To stop a message during playback, press [9].
- To erase a message during playback, press [✳], [4].

10.3.3. Erasing All Messages

1 Press [▤/OK].
2 Select "Answer System", then press [▶].
3 Select "Erase Message", then press [▶].
4 Select "Erase All", then press [▶].
5 Select "Yes", then press [▶].
6 Press [📞⏻].

Note:
- The greeting message is not erased.

10.4. Using Direct Commands

You can operate the answering system by pressing dial keys, rather than navigating through the menus. To use the following commands, press 【▤/OK】, select "Answer System", then press 【▶】.

Key	Direct commands
【1】	Repeat message (during playback)*1
【2】	Skip message (during playback)
【3】	Enter the "Settings" menu
【4】	Play new messages
【5】	Play all messages
【6】	Play greeting message
【7】【4】	Record memo message
【7】【6】	Record greeting message
【8】	Turn answering system on
【9】	Stop (recording, playback)
【0】	Turn answering system off
【✳】【4】	Erase this message (during playback)
【✳】【5】	Erase all messages
【✳】【6】	Erase greeting message

*1 If pressed within the first 5 seconds of a message, the previous message will be played.

10.5. Remote Operation

Using a touch tone phone, you can call your phone number from outside and access the unit to listen to messages or change answering system settings. The unit's voice guidance will prompt you to press certain dial keys to perform different operations.

Important:

- In order to operate the answering system remotely, you must first turn on remote operation by setting a remote access code. This code must be entered each time you operate the answering system remotely.

10.5.1. Turning remote operation on/off

A 3-digit remote access code must be entered when operating the answering system remotely. This code prevents unauthorised parties from listening to your messages remotely. After you store your remote access code, remote operation is possible.

1. Press **[▤/OK]**.
2. Select "**Answer System**", then press **[▶]**.
3. Select "**Settings**", then press **[▶]**.
4. Select "**Remote Code**", then press **[▶]**.
5. To turn on remote operation, enter a 3-digit remote access code.
   - To turn off remote operation, press **[✳]**.
6. Press **[▤/OK]**.
7. Press **[↘⏻]**.

10.5.2. Turning on the answering system remotely

If the answering system is off, you can turn it onremotely.

1. Dial your phone number from a touch tone phone.
2. Let the phone ring 15 times.
   - A long beep will be heard.
3. Enter your remote access code within 10 seconds of the long beep.
   - The greeting message is played back.
   - You can hang up, or enter your remote access code again and begin remote operation.

11 TROUBLESHOOTING

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

Initial settings

Problem	Cause & solution
Ⓨ is flashing.	● The handset is not registered to the base unit. Register it (*1). ● The handset is too far from the base unit. Move closer. ● The AC adaptor is not connected. Check the connections.
The handset display is blank.	● The handset is not turned on. Turn the power on (*2).
The handset will not turn on.	● Make sure that the batteries are installed correctly (*3). ● Fully charge the batteries (*4). ● Clean the charge contact and charge again (*4).

Cross Reference:

(*1) **Registering a Handset to a Base Unit** (P.26)

(*2) **Turning the Power On/Off** (P.21)

(*3) **Battery Installation** (P.6)

(*4) **Battery Charge** (P.6)

Telephone

Problem	Cause & solution
I cannot make or receive calls.	● The AC adaptor or telephone line cord is not connected. Check the connections. ● If you are using a splitter to connect the unit, remove the splitter and connect the unit to the wall socket directly. If the unit operates properly, check the splitter. ● Disconnect the base unit from the telephone line and connect the line to a known working telephone. If the working telephone does not operate properly, contact your service provider. ● The call bar feature is turned on. Turn it off (*5). ● You dialled a call restricted number (*6). ● The key lock feature is turned on. Turn it off (*7).
The unit does not ring.	● The ringer volume is turned off. Adjust the handset ringer volume and the base unit ringer volume (*8). ● The night mode feature is turned on. Turn it off (*9).
The batteries should be charging but the battery icon does not change.	● Clean the charge contact and charge again. ● The AC adaptor is disconnected. Plug in the AC adaptor.
A busy tone is heard when【↘】is pressed.	● The handset is too far from the base unit. Move closer and try again. ● Another handset is on an outside call. Wait for the other user to complete the call.

Cross Reference:

(*5) **Turning Call BAR On/Off (Call Prohibition)** (P.18)

(*6) **Setting Call Restriction** (P.17)

(*7) **Key Lock** (P.17)

(*8) **Ringer Volume** (P.13)

(*9) **Night Mode** (P.14)

Problem	Cause & solution
Static is heard, sound cuts in and out. Interference from other electrical units.	● Locate the handset and the base unit away from other electrical appliances. ● Move closer to the base unit. ● Your unit is connected to a telephone line with DSL service. We recommend connecting a filter (contact your DSL service provider) to the telephone line between the base unit and the telephone line jack.
The handset stops working while being used.	● Disconnect the AC adaptor and turn off the handset. Connect the AC adaptor, turn on the handset and try again.
While storing an entry in the phonebook or assigning a one touch dial, the handset starts to ring.	● A call is being received. To answer the call, press 【 】. Programming will be cancelled. Try again after the call.
Pressing 【C●】 does not display/dial the last number dialled.	● The redialled number was more than 24 digits long. Redial the number manually.
The handset beeps intermittently and/or flashes.	● Fully charge the batteries (*10).
I fully charged the batteries, but still flashes.	● Clean the charge contact and charge again (*10). ● It is time to replace the batteries (*11).
Caller information is not displayed.	● You must subscribe to Caller ID service (*12). ● Your unit is connected to a telephone line with DSL service. We recommend connecting a filter (contact your DSL service provider) to the telephone line between the base unit and the telephone line jack.
While viewing caller information, the display returns to standby mode.	● Do not pause for over 1 minute while searching.
I cannot register a handset to a base unit.	● Easy Registration is available only when the handset isn't registered to any base units. ● The maximum number of base units (4) are already registered to the handset. Cancel unused base unit registrations from the handset (*13). ● The maximum number of handsets (6) are already registered to the base unit. Cancel unused handset registrations from the base unit (*14). ● You entered the wrong PIN number. If you forget your PIN, refer to "**For Service Hint**" in "**PIN Code**". (*15) ● Locate the handset and the base unit away from other electrical appliances.

Cross Reference:

(*10) **Battery Charge** (P.6)

(*11) **Battery Replacement** (P.7)

(*12) **Caller ID Display** (P.20)

(*13) **Cancelling a Base Unit** (P.27)

(*14) **Cancelling a Handset** (P.26)

(*15) **PIN Code** (P.15)

SMS (Short Message Service)

Problem	Cause & solution
I cannot send or receive SMS messages.	• You have not subscribed to the appropriate service. Consult your service provider. • The SMS message centre number(s) are not stored or are incorrect. Store the correct numbers (*16). • Message transmission was interrupted. Wait until the message has been sent before using other telephone functions. • SMS message memory is full. Erase unnecessary message in the receive and send lists (*17) (*18). • Your unit is connected to a telephone line with DSL service. We recommend connecting a filter (contact your DSL service provider) to the telephone line between the base unit and the telephone line jack.
"FD" is displayed.	• The unit could not connect to the SMS message centre. Confirm that the correct SMS message centre numbers are stored (*16). Confirm that SMS is turned on (*19).
"FE" is displayed.	• An error occurred while sending the message. Try again.
"EO" is displayed.	• Your phone number is permanently withheld or you have not subscribed to the appropriate service. Consult your service provider.
"✓" is not displayed after you read a message. An error code ("FD", "FE" or "EO") is displayed.	• When an error code is displayed, "✓" will not be displayed even if you have read the message.

Cross Reference:

(*16) **Changing SMS Message Centre Numbers** (P.32)

(*17) **Erasing Saved Messages** (P.30)

(*18) **Erasing Received Messages** (P.31)

(*19) **Turning SMS On/Off** (P.32)

Answering system

Problem	Cause & solution
The other party complains that they cannot leave a message.	• The recording time is set to "Greeting Only", Select "1 Minute" or "3 Minutes". • Message memory is full. Erase unnecessary messages (*20).
I cannot operate the answering system with the handset.	• Another handset user is using the answering system, SMS features, accessing the caller list or changing base unit settings. Wait for the other user to finish. • A caller is leaving a message. Wait for the caller to finish. • The handset is too far from the base unit. Move closer.
I cannot operate the answering system remotely.	• You are entering the wrong remote access code. Confirm that the correct remote code is entered. If you forget the remote access code, store a new remote access code again (*21). • You are pressing the dial keys too quickly. Press each key firmly. • The answering system is turned off. Turn it on (*22). • You are using a pulse telephone. Try again using a touch tone phone.
While recording a greeting message or listening to messages, the unit rings and recording stops.	• A call is being received. Answer the call and try again later.

Cross Reference:

(*20) **Erasing All Messages** (P.34)

(*21) **Turning remote operation on/off** (P.36)

(*22) **Turning on the answering system remotely** (P.36)

12 DISASSEMBLY INSTRUCTIONS

12.1. Base Unit

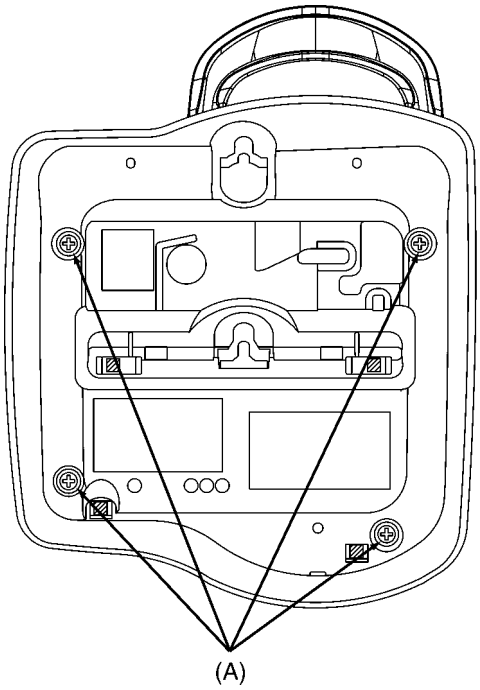


Fig. 1

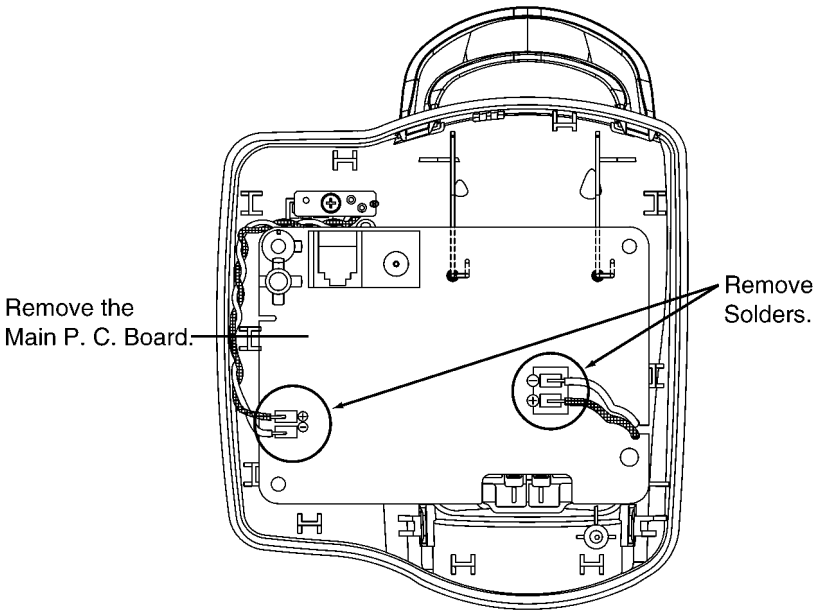


Fig. 2

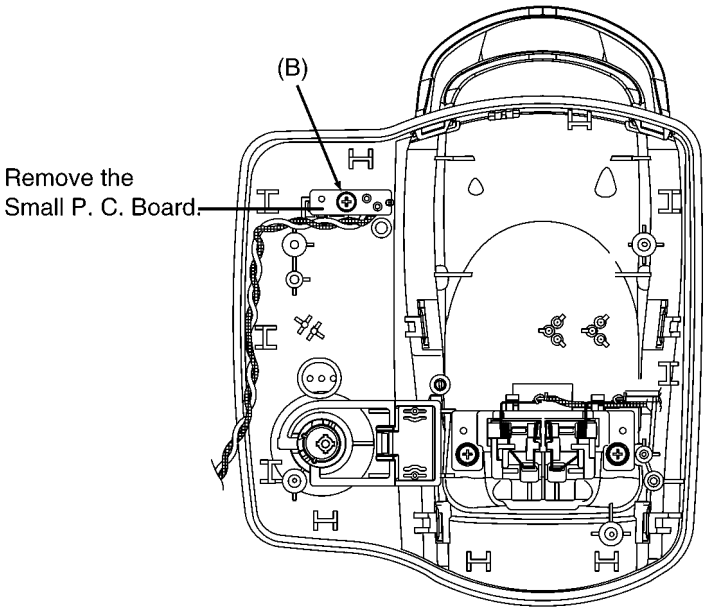


Fig. 3

Shown in Fig.-	To Remove	Remove
1	Cabinet Cover	Screws (2.6 × 10).....(A) × 4
2	Main P.C. Board	Solders
		Main P.C. Board
3	Small P.C. Board	Screw (2.6 x 10).....(B) x 1
		Small P.C. Board

12.2. Handset

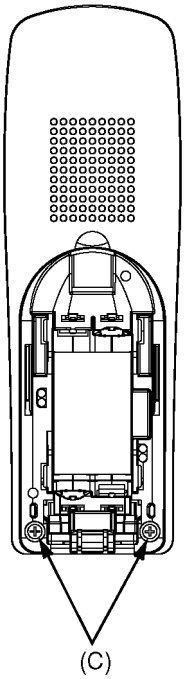


Fig.4

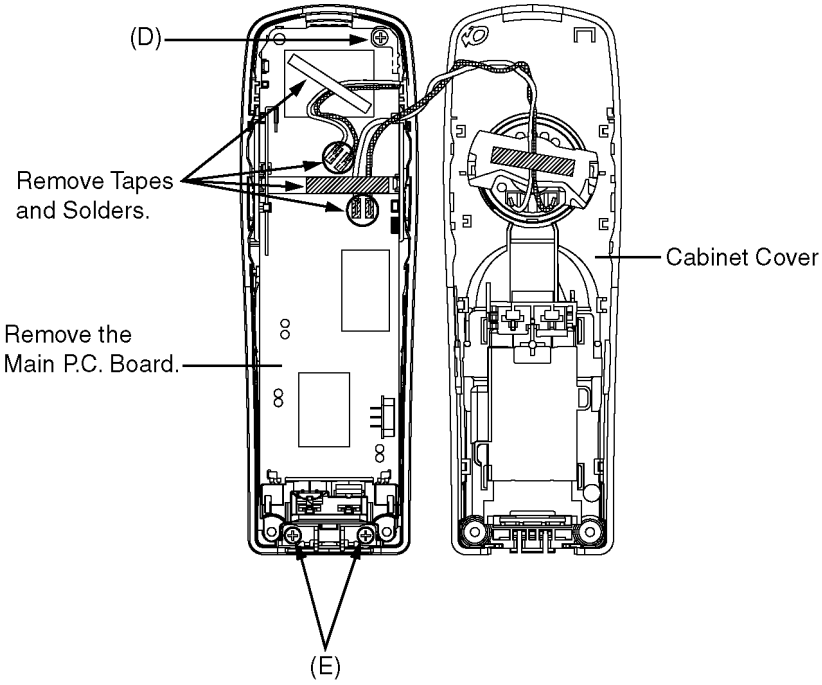
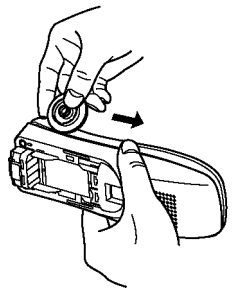
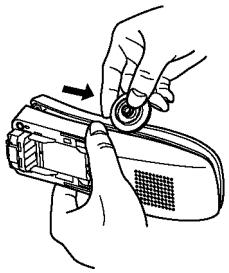
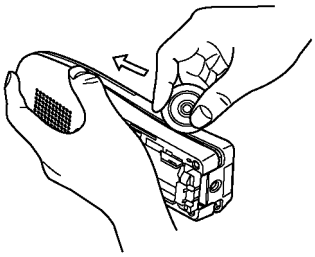


Fig.6

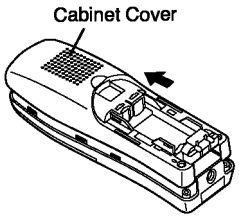


Insert a JIG (PQDJ10006Y) between the Cabinet Body and the Cabinet Cover, then pull it along the gap to open the Cabinet.





Likewise, open the other side of the Cabinet.



Remove the Cabinet Cover by pushing it upward.

Fig.5

Shown in Fig.-	To Remove	Remove
4	Cabinet Cover	Screws (2 × 10).....(C) × 2
5		Follow the procedure.
6	Main P.C. Board	Screw (2 × 10).....(D) × 1
		Screws (2 × 10).....(E) × 2
		Tapes and Solders
		Main P.C. Board

12.3. Charger Unit

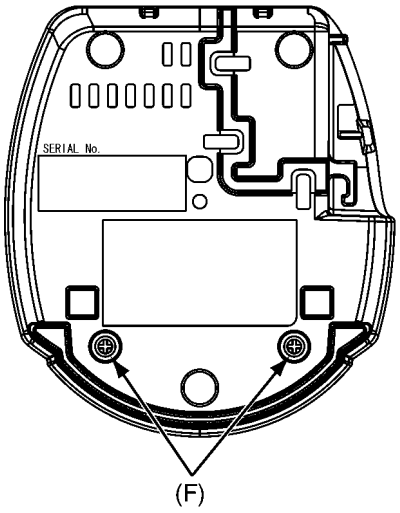


Fig. 7

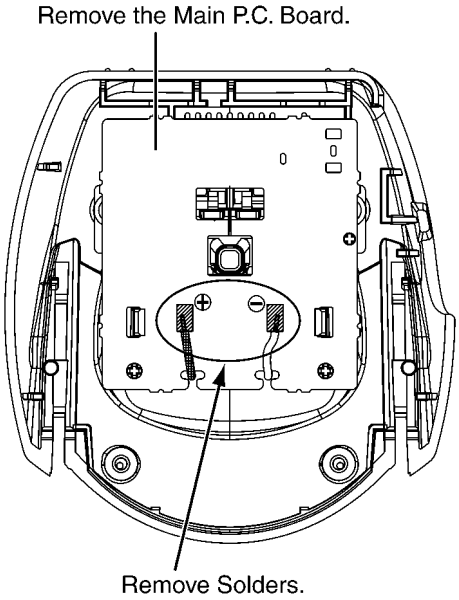
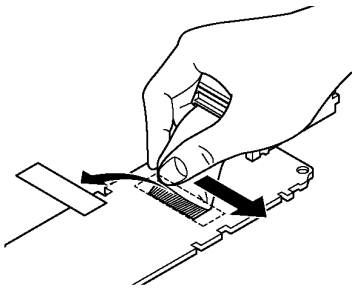


Fig. 8

Shown in Fig.-	To Remove	Remove
7	Cabinet Cover	Screws (2.6 × 10).....(F) × 2
8	Main P.C. Board	Solders
		Main P.C. Board

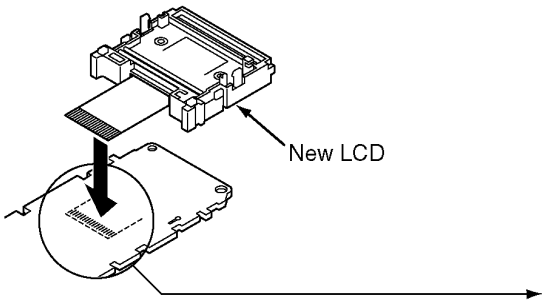
13 HOW TO REPLACE THE HANDSET LCD

①

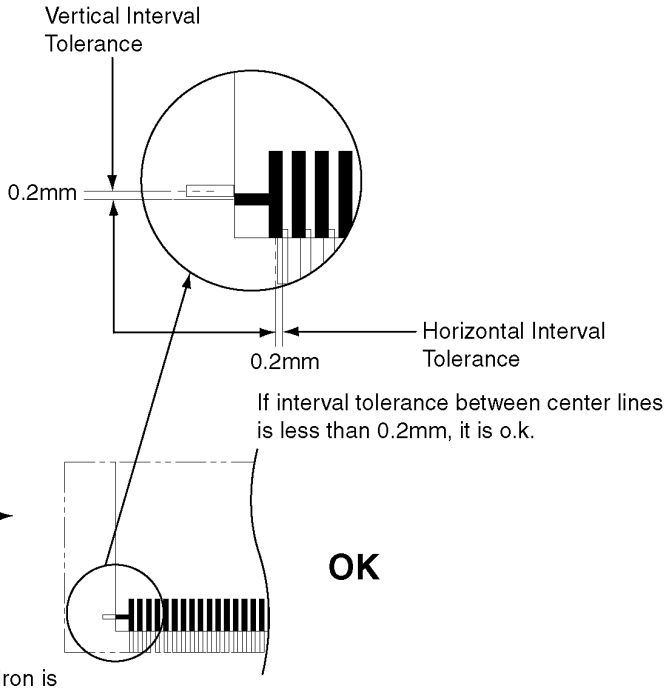


Remove the tape, and then peel off the FFC of LCD in the direction of the arrow not to damage the foil on the P.C. Board.

②



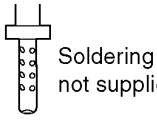
Fit the Heatseal of a New LCD to the P.C. Board.

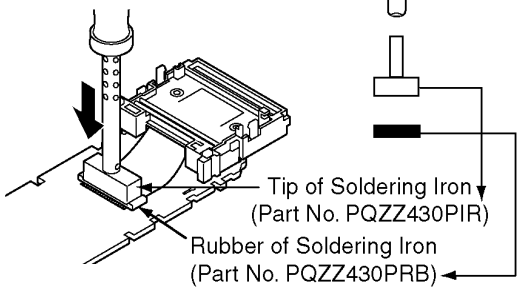


If interval tolerance between center lines is less than 0.2mm, it is o.k.

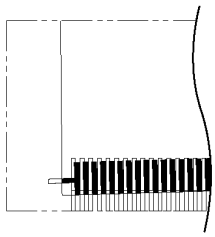
OK

③





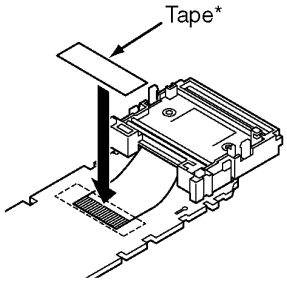
Heatweld with the Tip of Soldering Iron about 5 to 10 seconds (in case of 60W soldering iron).



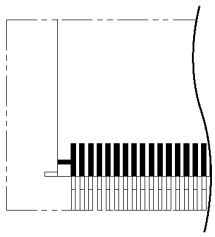
NG

(Inclined)

④

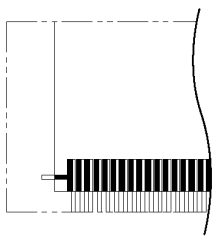


Stick the Tape* over the FFC.
* Use the Tape which was removed first.



NG

(Vertical interval tolerance is more than 0.2mm.)

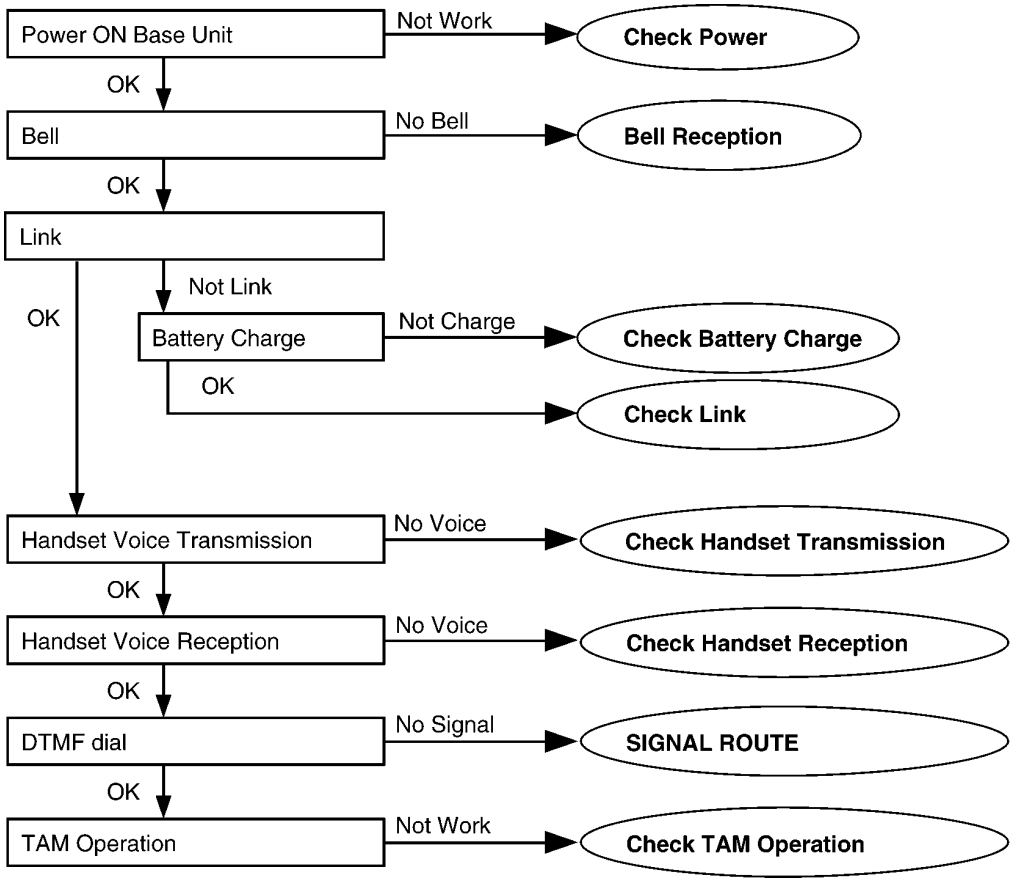


NG

(Horizontal interval tolerance is more than 0.2mm.)

14 TROUBLESHOOTING FLOWCHART

Flow Chart



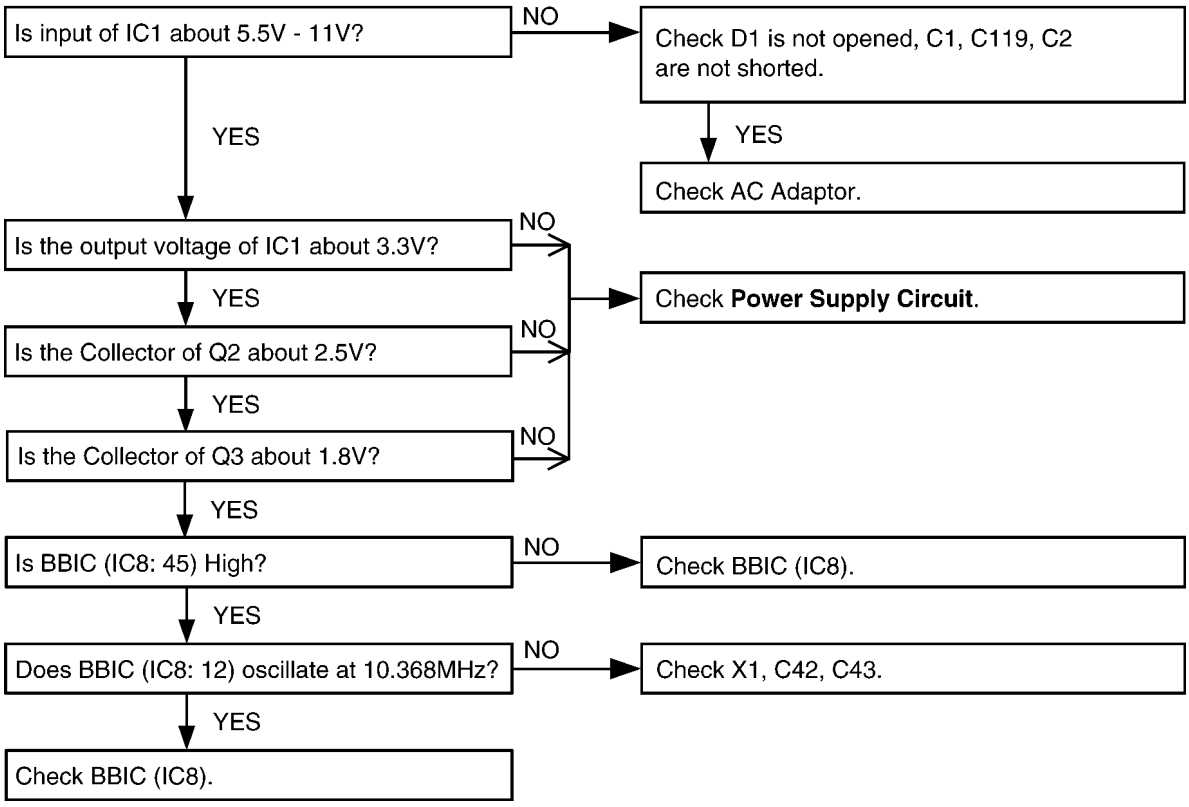
Cross Reference:

Check Power (P.45)
Bell Reception (P.52)
Check Battery Charge (P.46)
Check Link (P.47)
Check Handset Transmission (P.51)
Check Handset Reception (P.51)
SIGNAL ROUTE (P.77)
Check TAM Operation (P.52)

14.1. Check Power

14.1.1. Base Unit

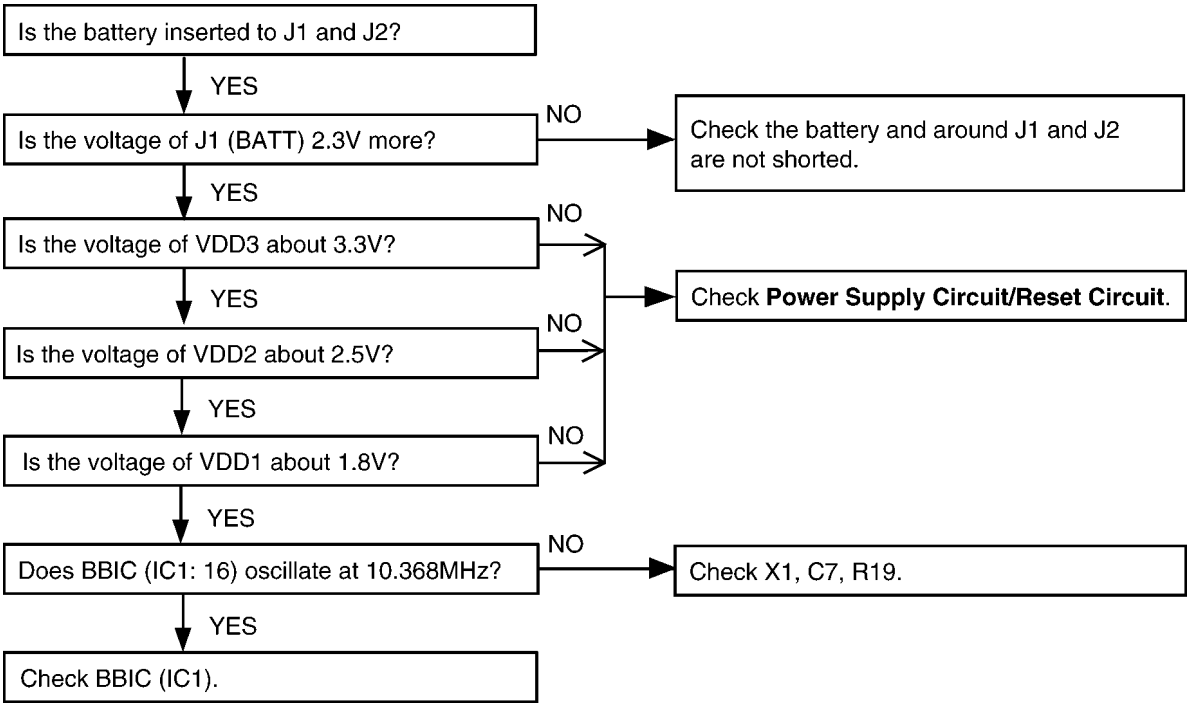
Is the AC Adaptor inserted into AC outlet? (Check AC Adaptor's specification.)



Cross Reference:

Power Supply Circuit (P.72)

14.1.2. Handset

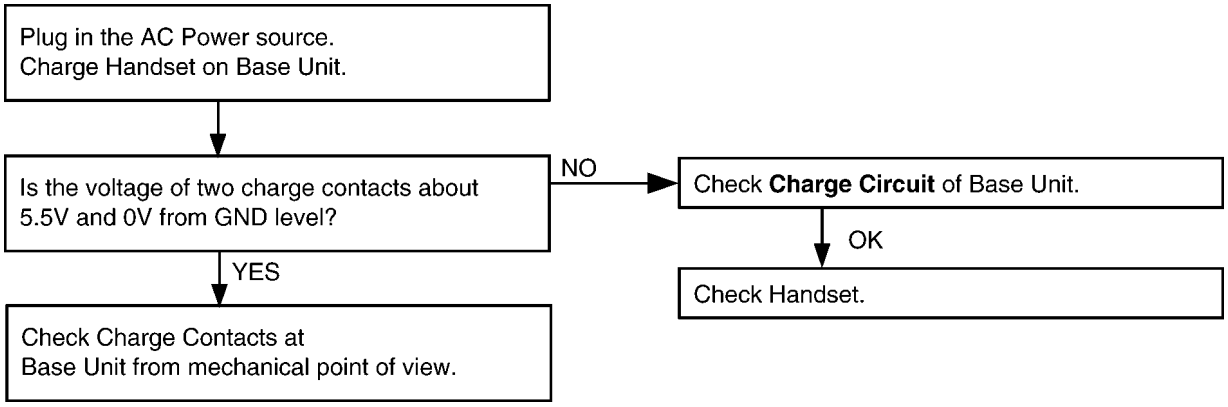


Cross Reference:

Power Supply Circuit/Reset Circuit (P.75)

14.2. Check Battery Charge

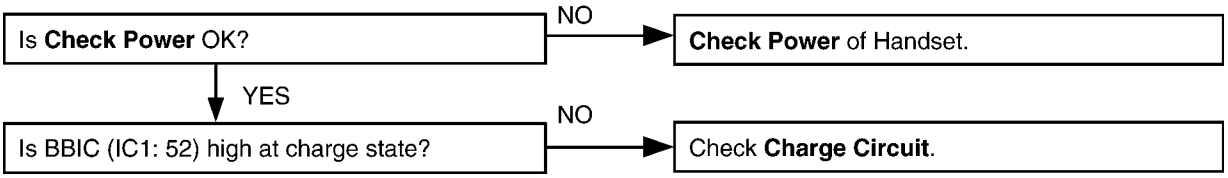
14.2.1. Base Unit



Cross Reference:

Charge Circuit (P.75)

14.2.2. Handset

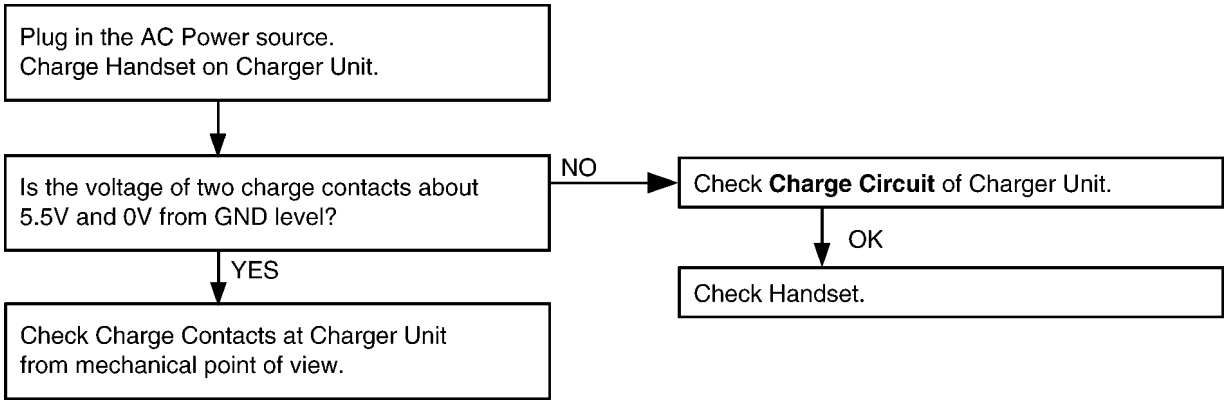


Cross Reference:

Check Power (P.45)

Charge Circuit (P.75)

14.2.3. Charger Unit

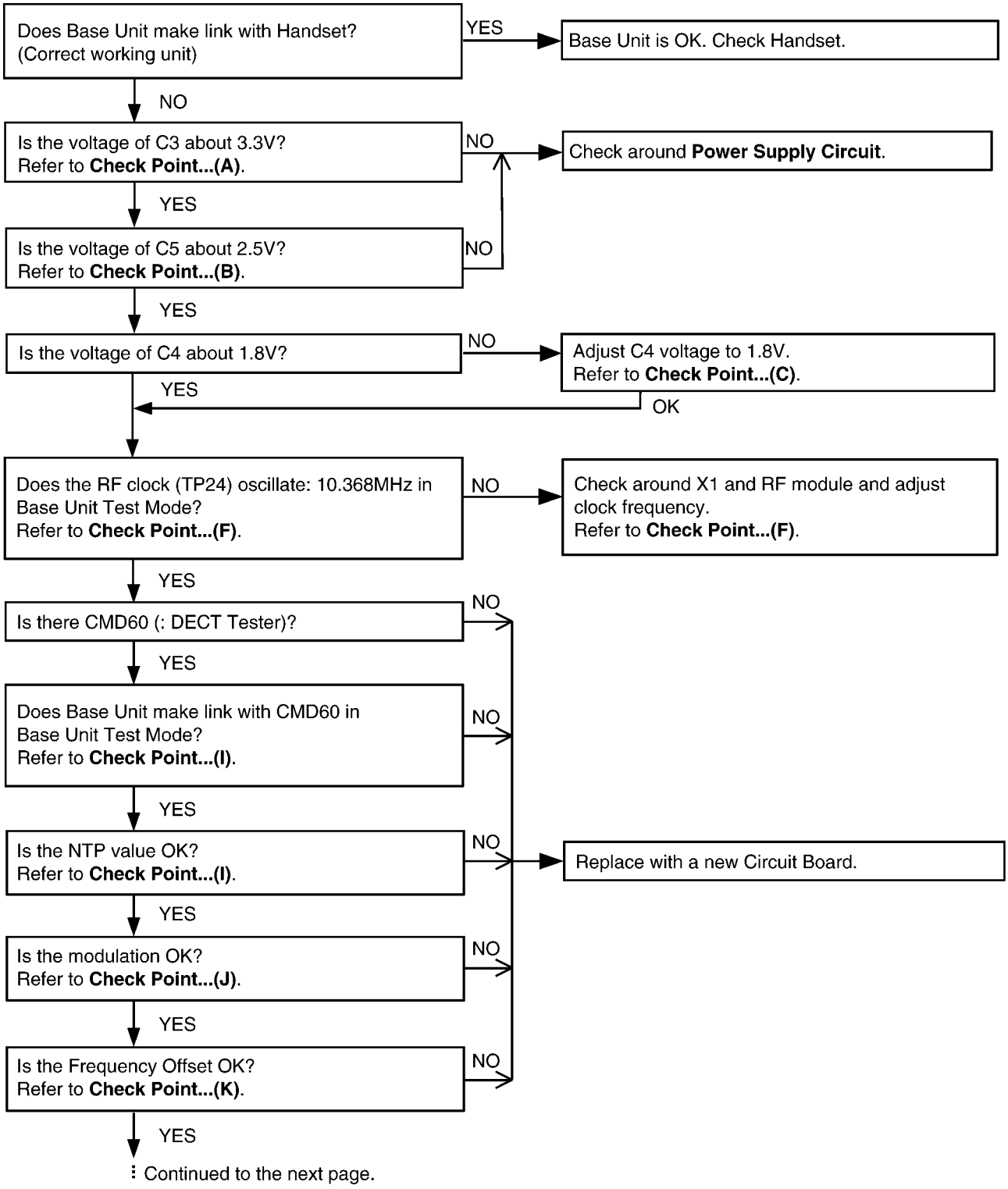


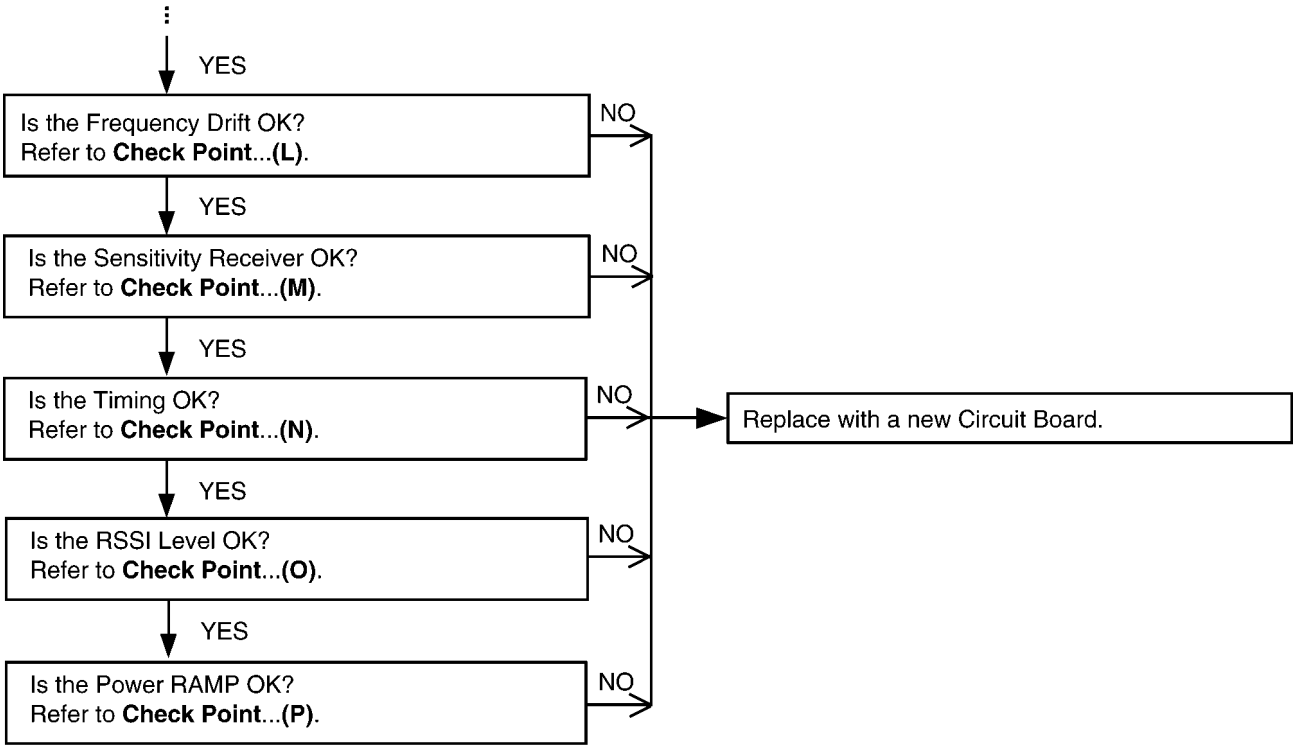
Cross Reference:

Charge Circuit (P.75)

14.3. Check Link

14.3.1. Base Unit



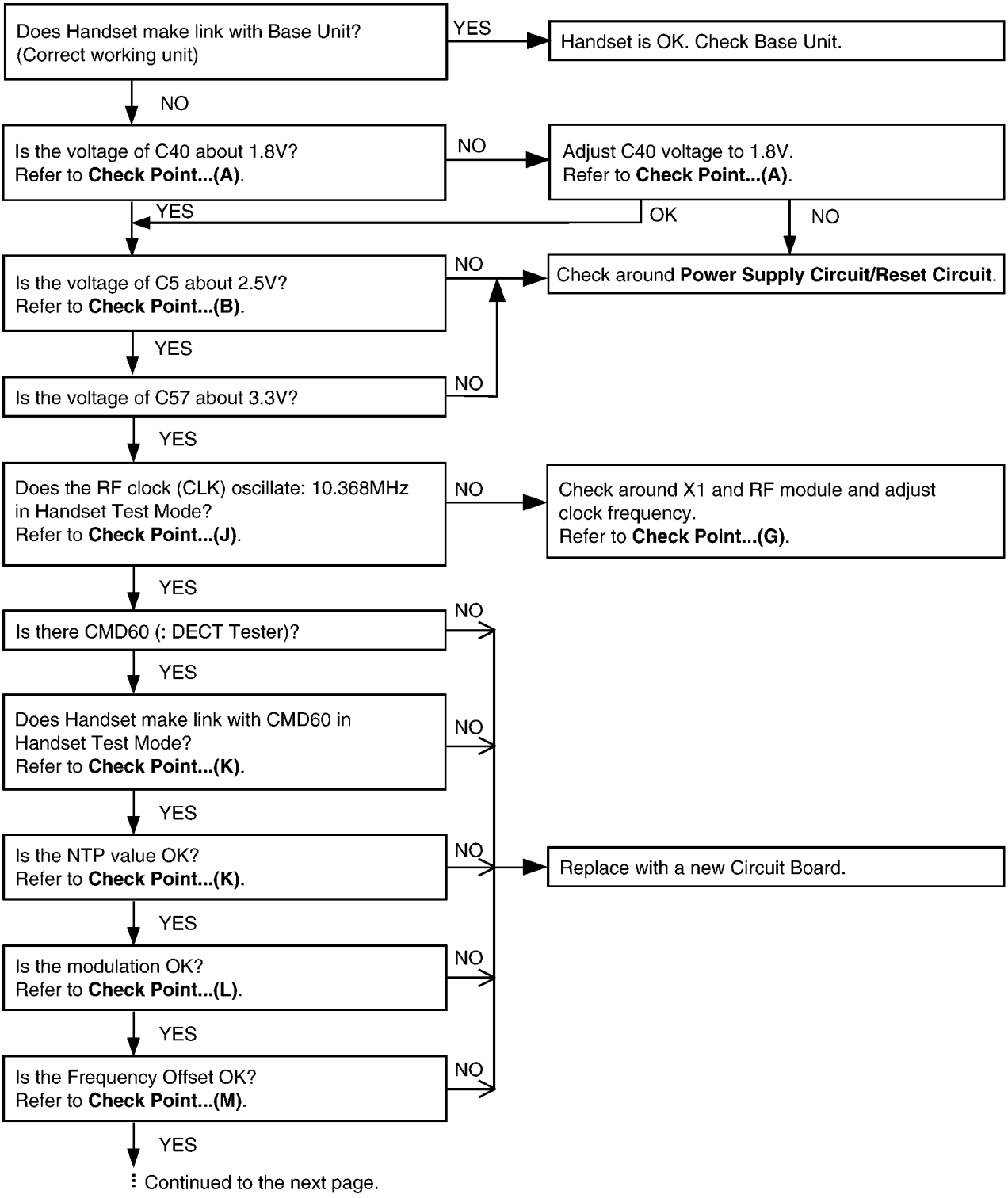


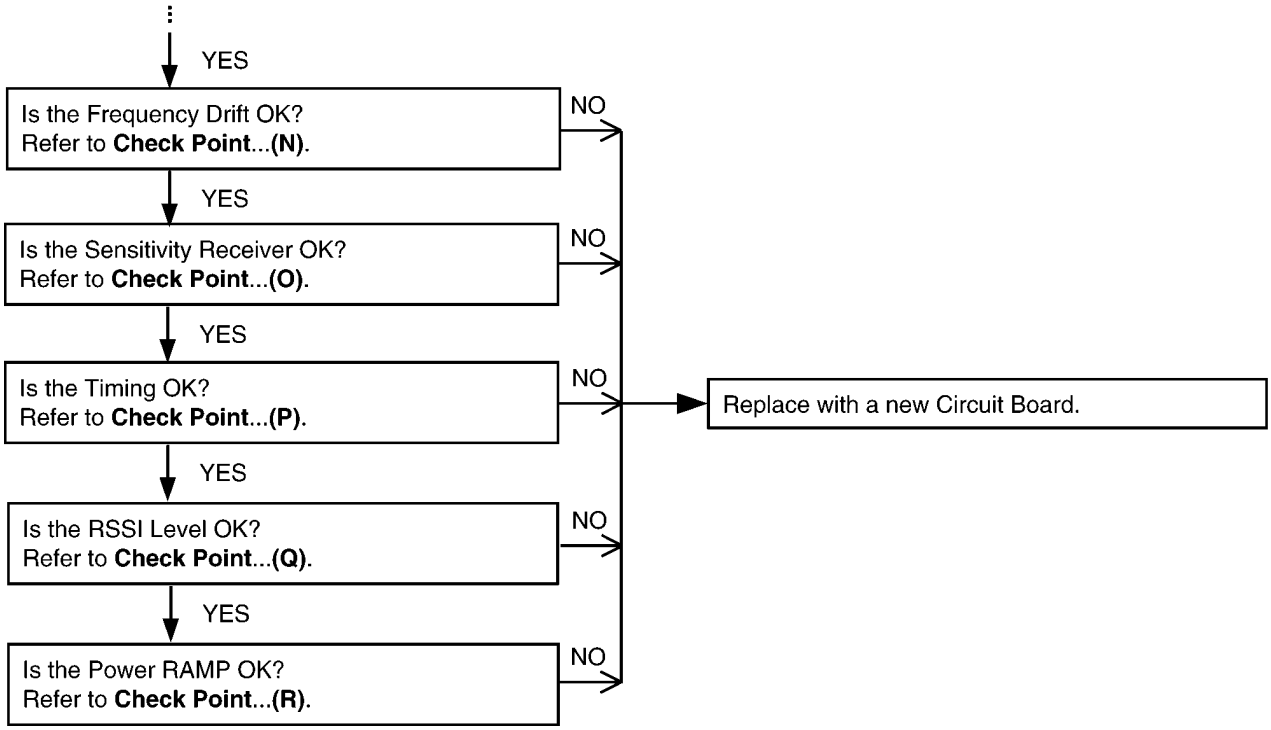
Cross Reference:

Power Supply Circuit (P.72)

Check Point (Base Unit) (P.53)

14.3.2. Handset



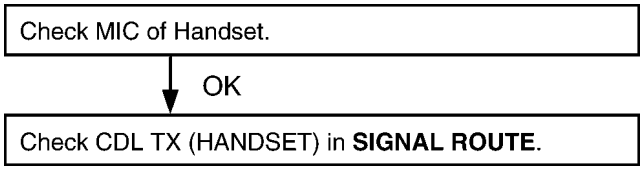


Cross Reference:

Power Supply Circuit/Reset Circuit (P.75)

Check Point (Handset) (P.60)

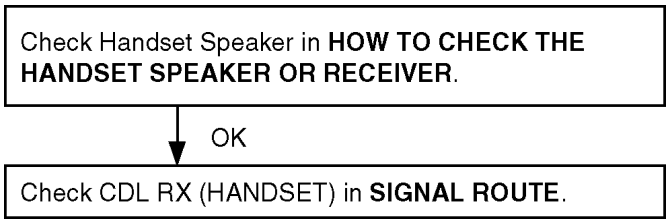
14.4. Check Handset Transmission



Cross Reference:

SIGNAL ROUTE (P.77)

14.5. Check Handset Reception



Cross Reference:

HOW TO CHECK THE HANDSET SPEAKER OR RECEIVER (P.69).

SIGNAL ROUTE (P.77)

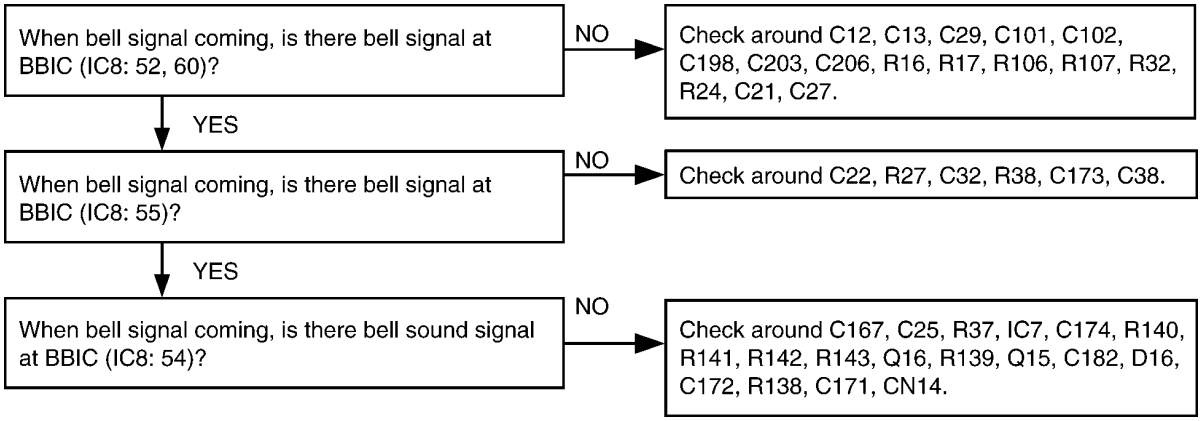
14.6. Check Caller ID

Cross Reference:

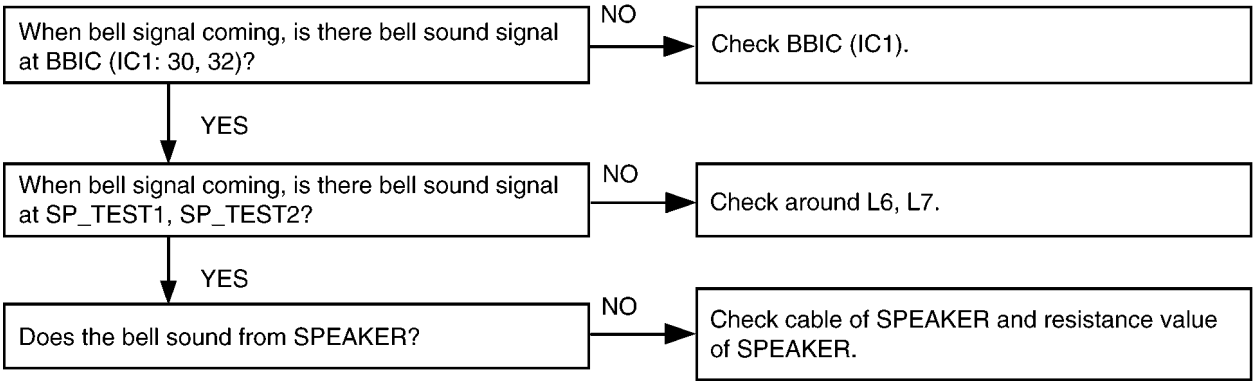
SIGNAL ROUTE (P.77)

14.7. Bell Reception

14.7.1. Base Unit



14.7.2. Handset



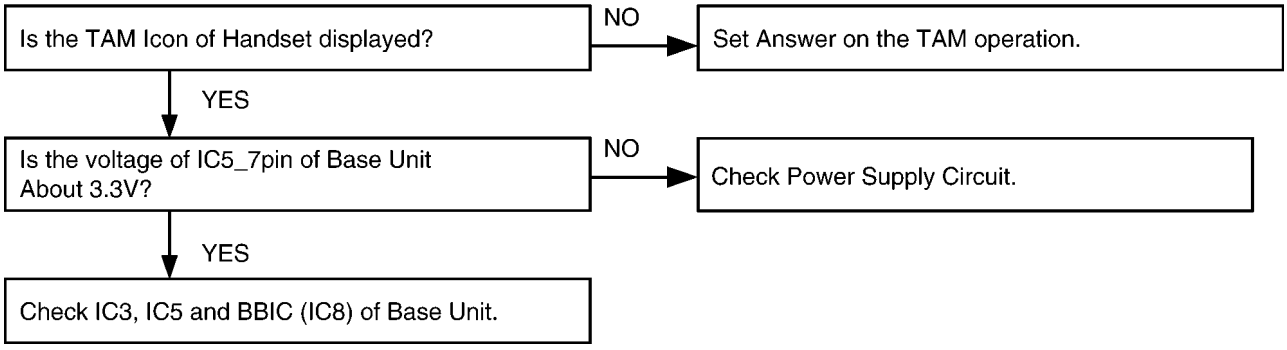
Cross Reference:

Telephone Line Interface (P.73)

Check Link (P.47)

HOW TO CHECK THE HANDSET SPEAKER OR RECEIVER (P.69)

14.8. Check TAM Operation



Cross Reference:

Power Supply Circuit (P.72)

15 TROUBLESHOOTING BY SYMPTOM (BASE UNIT AND CHARGER UNIT)

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

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

Note:

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

(*2) Refer to **Check Point (Base Unit)** (P.53)

15.1. Check Point (Base Unit)

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

Note:

After the measuring, sock up the solder of TP.

*: **PC Setting** (P.65) is required beforehand.

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

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)	3.3V Supply Confirmation	TP14	1. Confirm that the voltage between test point VDD3 and GND is 3.3V ± 0.2V.	D1, IC1, C1, C119, C2, R8, R9, C114, C34, C8, R85
(**B**)	2.5V Supply Confirmation	TP22	1. Confirm that the voltage between test point VDD2 and GND is 2.5V ± 0.2V.	Q2, C5, C7, C168
(**C**)*	1.8V Supply Confirmation	TP15	1. Confirm that the voltage between test point VDD1 and GND is 1.8V ± 0.1V.	Q3, C6, C11, C48, C4, C37, C39, C44, C45
(**D**)*	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: 64C0 / program number: D591ZC	IC8, X1, C42, C43, R40, C6, C11, C48, C4, C37, C39, C44, C45, R124, R125, C153
(**E**)*	EEP-ROM Confirmation	-	1. EEP-ROM Confirmation (Execute the command "ChkTCD220XXrevYY"). 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, PQZZ- mentioned in **JIG and PC** (P.57).	IC3, C53, R56, R57
(**F**)*	BBIC Clock Adjustment	CLK	1. Input Command "rdeeprom 00 01 01", then you can confirm the current value. 2. Adjust the frequency of CLK executing the command "setfreq xx (where xx is the value)" so that the reading of the frequency counter is 10.368000MHz ± 10Hz.	IC2, IC4, R124, R125, C153, X1, C42, C43

	Items	Check Point	Procedure	Check or Replace Parts
(**G**)*	Hookswitch Check with DC Characteristics	-	1. Connect CN1 (Telephone Socket) to Tel-simulator which is connected with 600 Ω. 2. Set line voltage to 48V and line current to 40mA at off-hook condition of normal telephone. 3. Execute the command “hookoff” 4. Confirm that the line current is 40mA ± 5mA. 5. Execute the command “hookon”. 6. Confirm that the line current is less than + 0.8mA.	CN1, L6, L7, Q4, R23, R25, Q5, R26, R28, IC8, D3
(**H**)*	DTMF Generator Check	-	1. Connect CN1 (Telephone Socket) to DTMF tester. 2. Execute the command “hookoff” and “dtmf_hi”. 3. Confirm that the high frequency (1477Hz) is -6.0dBm ~ -10.0dBm. 4. Execute the command “dtmf_lo”. 5. Confirm that the low frequency (852Hz) is -8.5dBm ~ -12.5dBm.	IC8, R39, C41, R49, C46, C47, R42, R43, R44, R45, R46, R47, R48, C108, C109, C40, C36, Q8, D4
(**I**)*	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: 5 ・Traffic Slot: 4 ・Mode: Loopback ・PMID: 00000 ・RF LEVEL = -70dBm. 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 20dBm ~ 25dBm.	IC2, IC8, R124, R125, C153, C140, C141, DA1, C142, C143, C144, L3, L4, R118, R119, C135, R115, R116, Q6, C145, C147, C149, C151, C157, R123, C158, C159, C160, C161, C162, C163, C164, C136, R117, R127, C156, C154, C155
(**J**)	Modulation Check and Adjustment	-	Follow steps 1 to 6 of **(I)** above. 7.Confirm that the B-Field Modulation is -350 ~ -400/+320 ~ +370kHz/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.)	IC2, IC8, R124, R125, C153, C140, C141, DA1, C142, C143, C144, L3, L4, R118, R119, C135, R115, R116, Q6, C145, C147, C149, C151, C157, R123, C158, C159, C160, C161, C162, C163, C164, C136, R117, R127, C156, C154, C155
(**K**)	Frequency Offset Check	-	Follow steps 1 to 6 of **(I)** above. 7.Confirm that the frequency offset is < ± 45kHz.	IC2, IC8, R124, R125, C153, C140, C141, DA1, C142, C143, C144, L3, L4, R118, R119, C135, R115, R116, Q6, C145, C147, C149, C151, C157, R123, C158, C159, C160, C161, C162, C163, C164, C136, R117, R127, C156, C154, C155

	Items	Check Point	Procedure	Check or Replace Parts
(**L**)	Frequency Drift Confirmation	-	Follow steps 1 to 6 of **(I)**. 7.Confirm that the frequency drift is < ± 30kHz/ms.	IC2, IC8, R124, R125, C153, C140, C141, DA1, C142, C143, C144, L3, L4, R118, R119, C135, R115, R116, Q6, C145, C147, C149, C151, C157, R123, C158, C159, C160, C161, C162, C163, C164, C136, R117, R127, C156, C154, C155
(**M**)	Sensitivity Receiver Confirmation	-	Follow steps 1 to 6 of **(I)**. 7.Set DECT tester power to -88dBm. 8.Confirm that the BER is < 1000ppm.	IC2, IC8, R124, R125, C153, C140, C141, DA1, C142, C143, C144, L3, L4, R118, R119, C135, R115, R116, Q6, C145, C147, C149, C151, C157, R123, C158, C159, C160, C161, C162, C163, C164, C136, R117, R127, C156, C154, C155
(**N**)	Timing Confirmation	-	Follow steps 1 to 6 of **(I)**. 7.Confirm that the Timing accuracy is < ± 2.0ppm.	IC2, IC8, R124, R125, C153, C140, C141, DA1, C142, C143, C144, L3, L4, R118, R119, C135, R115, R116, Q6, C145, C147, C149, C151, C157, R123, C158, C159, C160, C161, C162, C163, C164, C136, R117, R127, C156, C154, C155
(**O**)*	RSSI Level Confirmation	-	Follow steps 1 to 6 of **(I)**. 7.Execute the command “readrssi”. 8. Confirm that the returned value is 0×22 ± A (hex).	IC2, IC8, R124, R125, C153, C140, C141, DA1, C142, C143, C144, L3, L4, R118, R119, C135, R115, R116, Q6, C145, C147, C149, C151, C157, R123, C158, C159, C160, C161, C162, C163, C164, C136, R117, R127, C156, C154, C155

	Items	Check Point	Procedure	Check or Replace Parts
(**P**)	Power RAMP Confirmation	-	Follow steps 1 to 6 of **(I)**. 7.Confirm that Power RAMP is matching.	IC2, IC8, R124, R125, C153, C140, C141, DA1, C142, C143, C144, L3, L4, R118, R119, C135, R115, R116, Q6, C145, C147, C149, C151, C157, R123, C158, C159, C160, C161, C162, C163, C164, C136, R117, R127, C156, C154, C155
(**Q**)*	Audio Check	-	1. Link with Handset. 2. Input -45dBm/1kHz to MIC of Handset. Measure the Level at Line I/F and distortion level. 3. Confirm that the level is -7.5dBm ± 2dBm and that the distortion level is < 5% at TEL Line (600Ω Load). 4. Input -20dBm/1kHz to Line I/F. Measure the level at Receiver of Handset and distortion level (*Receive volume set to second position from minimum). 5. Confirm that the level is -20.5dBm ± 2dBm and that the distortion level is < 5% at Receiver (Volume Middle, 150Ω Load).	IC8, CN1,SA1, L6, L7, D3, Q4, Q5, R23, R25, R26, R28
(**R**)	Charging Check	-	1. Connect Charge Contact 12Ω/2W resistor between charge+ and charge-. 2. Measure and confirm voltage across the resistor is 2.85V ± 0.2V.	R3, R4, R5, D6, C107, C180, C181
(**S**)	TAM Operation Confirmation	-	1. TAM Confirmation (Execute the command “sendchar_VPI”) 2. Confirm the returned Value (Value is “D597SB”).	IC5, R132, C195, C196, C197, R130, C169, C208, R133, R134, C209, C210

15.2. The Setting Method of JIG (Base Unit)

15.2.1. Preparation

15.2.1.1. Equipment Required

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

15.2.1.2. JIG and PC

- EEPROM serial JIG
  JIG Cable: PQZZ1CD300E*
- PC which runs in DOS mode
- **Batch file** for setting: PQZZTCD220SL

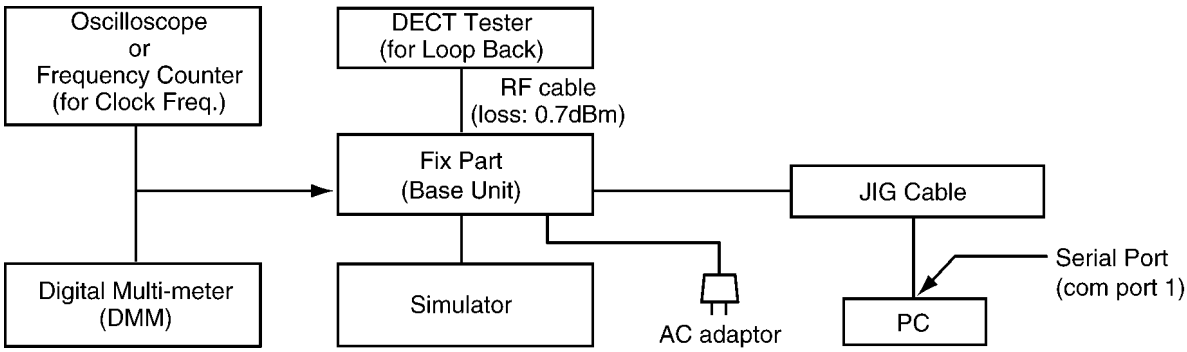
Note:

*: 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

15.2.2. PC Setting

15.2.2.1. Connections



15.2.2.2. PC Setting

1. Open a window of MS-DOS mode from the start-up menu.
2. Change a directory.
3. Type “**SET_COM=1**” from the keyboard (when COM port 1 is used for the connection).
4. Type “doskey”.

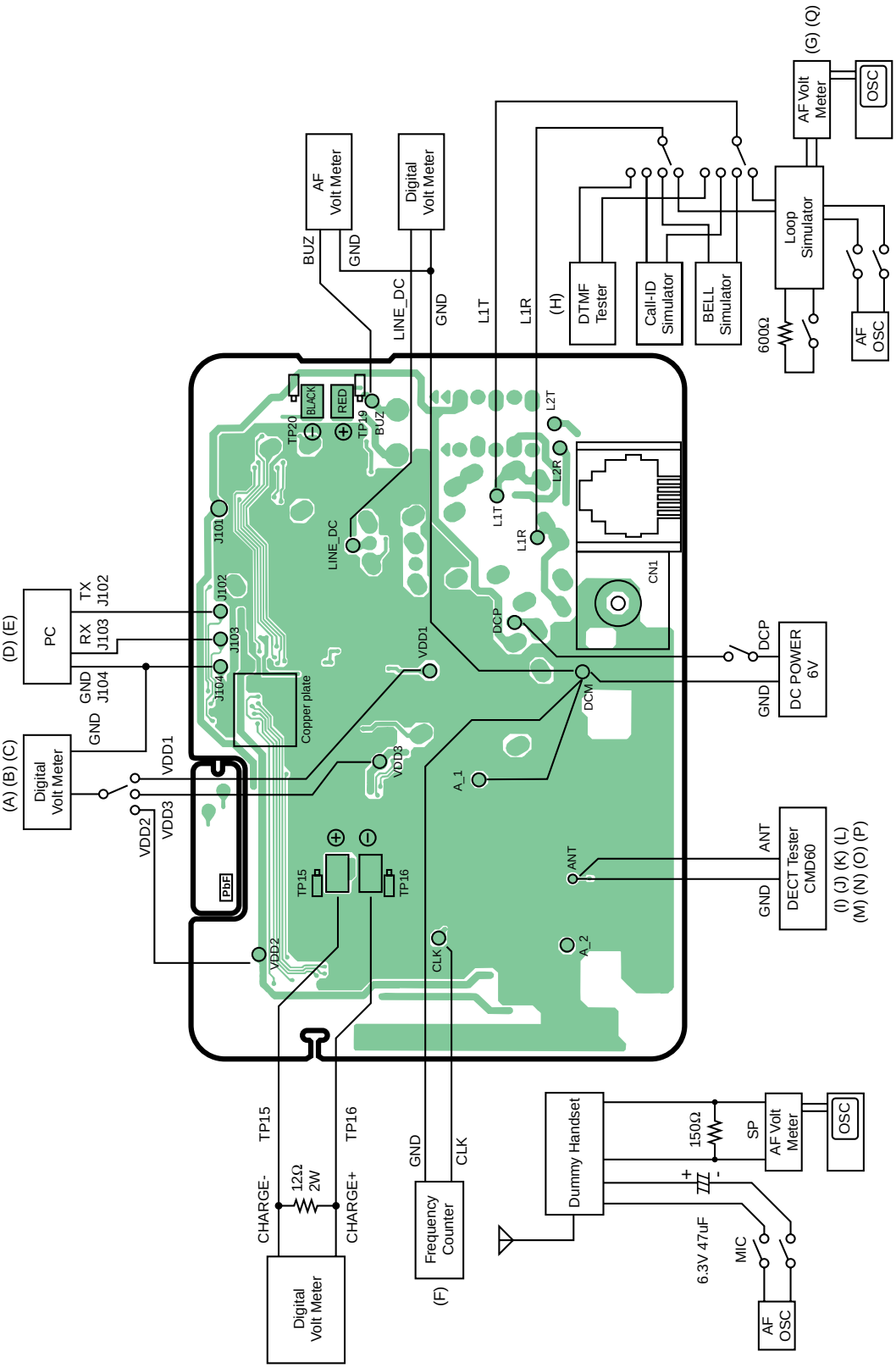
Note:

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”.
hookoff	Off-hook mode on Base	Type “hookoff”.
hookon	On-hook mode on Base	Type “hookon”.
getchk	Read checksum	Type “getchk”.
wreeprom	Write the data of EEPROM	Type “wreeprom 01 23 45”. “01 23” is address and “45” is data to be written.

15.3. Adjustment Standard (Base Unit)

When connecting the Simulator Equipment for checking, please refer to below.



Note:

(A) - **(R)** is referred to **Check Point (Base Unit)** (P.53)

15.4. Check Point (Charger Unit)

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)	Charging Check	-	1. Connect Charge Contact 12Ω/2W resistor between charge+ and charge-. 2. Measure and confirm voltage across the resistor is 2.85V ± 0.2V.	D11, R11, R12

Note:

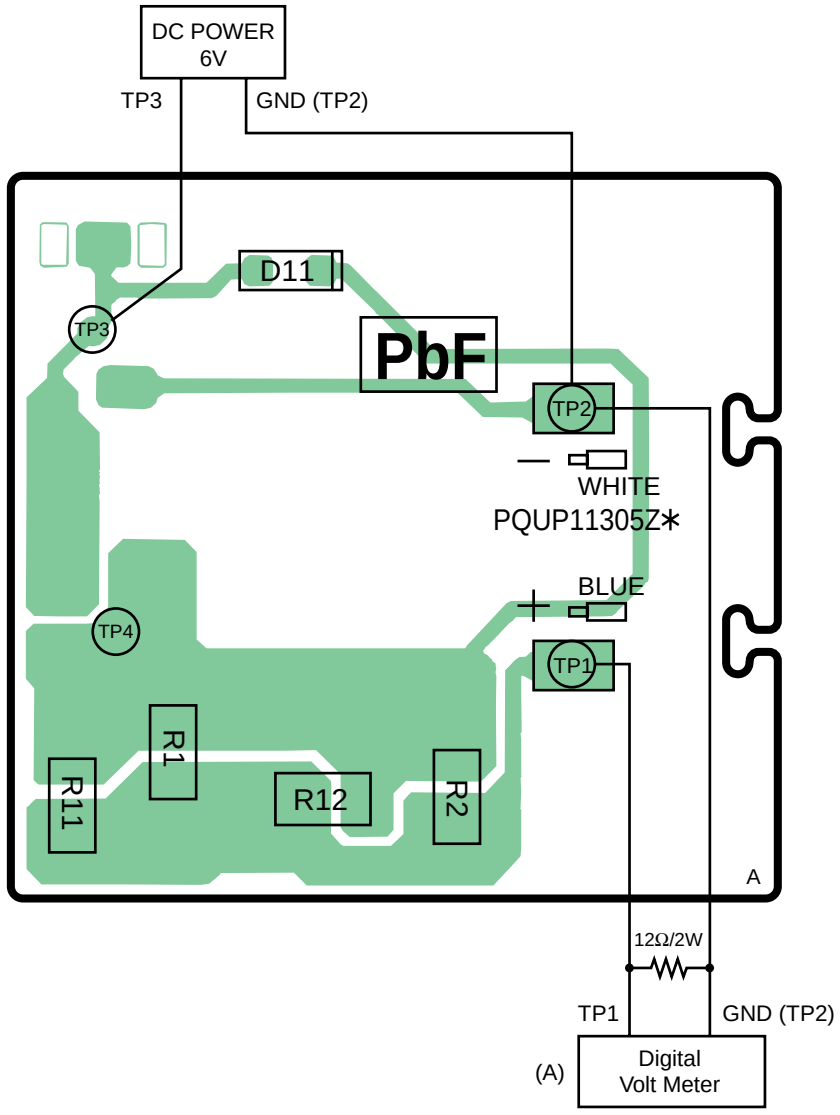
After the measuring, sock up the solder of TP.

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

15.5. Adjustment Standard (Charger Unit)

When connecting the Simulator Equipment for checking, please refer to below.

15.5.1. Flow Solder Side View



Note:

(**A**) is referred to **Check Point (Charger Unit)** (P.59)

16 TROUBLESHOOTING BY SYMPTOM (HANDSET)

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

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

Note:

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

(*2) Refer to **Check Point (Handset)** (P.60)

16.1. Check Point (Handset)

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

Note:

After the measuring, sock up the solder of TP.

*: **PC Setting** (P.65) is required beforehand.

The connections of adjustment equipment are as shown in **Adjustment Standard (Handset)** (P.66).

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)*	1.8V Supply Adjustment	VDD1	1. Confirm that the voltage between test point VDD1 and GND is 1.8V ± 0.02V. 2. Execute the command "bandgap", then check the current value. 3. Adjust the 1.8V voltage of VDD1 executing command "bandgap XX"(XX is the value).	IC1, Q2, C40
(**B**)	DC/DC Supply Confirmation	VDD3	1. Confirm that the voltage between test point VDD3 and GND is 3.3V ± 0.3V (Backlight is ON).	IC1, F1, C1, C3, C57, R1, Q1, D1, L1,57
(**C**)	2.5V Supply Confirmation	VDD2	1. Confirm that the voltage between test point VDD2 and GND is 2.5V ± 0.1V.	IC1, Q3, C4, C5
(**D**)*	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: 9AC9 / program number: D562ZA	IC1, X1,C7, R19
(**E**)*	EEP-ROM Confirmation	-	1. EEP-ROM Confirmation (Execute the command "ChkTCA121XXrevYY"). 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, PQZZ- mentioned in **JIG and PC** (P.57).	IC3, IC1, R39, R40, R91, R90, R96, Q10, Q11, C113

	Items	Check Point	Procedure	Check or Replace Parts
(**F**)	Charge Control Check & Charge Current Monitor Check	-	1. Apply 6V between J3(+) and J4(-) with DC power supply and set current limit to 250mA. 2. Confirm that the current limit LED of DC power supply is ON/OFF. 3. Decrease current limit of DC power supply to 100mA. 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 handset power supply and try again.)	IC1, Q4, Q5, Q9, D6, L4, L5, C119, C120, R5, R6, R7, R72, F1
(**G**)*	Charge Detection (OFF) Check	-	1. Stop supplying 6V to CHARGE(+) and CHARGE(-). 2. Execute the command “Backloff” then “charge”. 3. Confirm that the returned value is 0x00 (hex).	IC1, Q4, Q5, Q9 D6, D7, L4, L5, C119, C120, R5, R6, R7, R72, F1
(**H**)*	Battery Monitor Check	-	1. Apply 2.25V between BATT and GND. 2. Execute the command “readbatt”. It assumes that the return value is XX. a) 1E ≦ XX ≦ 2C: No need to adjust b) XX: 18 ~ 1D: Need to adjust XX: 2D ~ 32: Need to adjust Write AD value of 2.25V to EEPROM. ex) read data: XX = 1D, write data: YY = 1D read data: XX = 2D, write data: YY = 2D EEPROM = 0X0004(Low Voltage) write “YY”, then EEPROM = 0X0005(No Voltage) write “YY - 1D” EEPROM = 0X000A(Low Voltage BL) write “YY - 06” No Voltage writing data limit is ‘00’. c) XX: 00 ~ 17: Reject XX: 33 ~ FF: Reject	IC1, F1, C1 C3, C118
(**I**)	Battery Low Confirmation	-	1. Apply 2.40V between BATTERY(+) and BATTERY(-). 2. Confirm that there is no flashing of Battery Icon. 3. Apply 2.25V ± 0.08V between BATTERY(+) and BATTERY(-). 4. Confirm that there is flashing of Battery Icon.	IC1, F1, C1 C3, C118
(**J**)*	BBIC Clock Adjustment	CLK	1. Apply 2.6V between BATTERY(+) and BATTERY(-) with DC power. 2. Execute the command “conttx”. 3. Input Command “rdeeprom 00 01 01”, then you can confirm the current value. 4. Adjust the frequency of CLK executing the command “setfreq xx (where xx is the value)” so that the reading of the frequency counter is 10.368000MHz ± 10Hz. Note: CLK is displayed only for a few seconds when executing the command “conttx” after battery is inserted.	IC1, X1, CN6, C7, R54, C62
(**K**)*	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 = -70dBm 2. Execute the command “regcmd60 01 02 03 04 05". 3. Initiate connection from DECT tester. 4. Confirm that the NTP value at A201 is 20dBm ~ 25dBm.	IC1, R54, C62, C123, C60, C63, C45, C44, C47, C46, C49, C48, C50, C53, C51, R59, C54, C55, CN6

	Items	Check Point	Procedure	Check or Replace Parts
(**L**)*	Modulation Check and Adjustment	-	Follow steps 1 to 3 of **(K)** above. 4.Confirm that the B-Field Modulation is -350 ~ -400/+320 ~ +370kHz/div using data type Fig 31. 5.Adjust the B-Field Modulation if required. (Execute the command “Readmod” and “wrtmod xx”, where xx is the value.)	IC1, R54, C62, C123, C60, C63, C45, C44, C47, C46, C49, C48, C50, C53, C51, R59, C54, C55, CN6
(**M**)	Frequency Offset Confirmation	-	Follow steps 1 to 3 of **(K)** above. 4.Confirm that the frequency Offset is < ± 45kHz.	IC1, R54, C62, C123, C60, C63, C45, C44, C47, C46, C49, C48, C50, C53, C51, R59, C54, C55, CN6
(**N**)	Frequency Drift Confirmation	-	Follow steps 1 to 3 of **(K)**. 4.Confirm that the frequency Drift is < ± 30kHz/ms.	IC1, R54, C62, C123, C60, C63, C45, C44, C47, C46, C49, C48, C50, C53, C51, R59, C54, C55, CN6
(**O**)	Sensitivity Receiver Confirmation	-	Follow steps 1 to 3 of **(K)**. 4.Set DECT tester power to -88dBm. 5.Confirm that the BER is < 1000ppm.	IC1, R54, C62, C123, C60, C63, C45, C44, C47, C46, C49, C48, C50, C53, C51, R59, C54, C55, CN6
(**P**)	Timing Confirmation	-	Follow steps 1 to 3 of **(K)**. 4.Confirm that the Timing accuracy is < ± 2.0ppm.	IC1, R54, C62, C123, C60, C63, C45, C44, C47, C46, C49, C48, C50, C53, C51, R59, C54, C55, CN6
(**Q**)*	RSSI Level Confirmation	-	Follow steps 1 to 3 of **(K)**. 4.Set DECT tester power to -81dBm. 5.Execute the command “readrssi“. 6.Confirm that the returned value is 0×1C ± 8 (hex). 7.Set DECT tester power to -63dBm. 8.Execute the command “readrssi“. 9.Confirm that the returned value is 0×25 ± 8 (hex).	IC1, R54, C62, C123, C60, C63, C45, C44, C47, C46, C49, C48, C50, C53, C51, R59, C54, C55, CN6
(**R**)	Power RAMP Confirmation	-	Follow steps 1 to 3 of **(K)**. 4.Confirm that Power RAMP is matching.	IC1, R54, C62, C123, C60, C63, C45, C44, C47, C46, C49, C48, C50, C53, C51, R59, C54, C55, CN6
(**S**)	Audio Check and Confirmation	-	1. Link to BASE which is connected to Line Simulator. 2. Set line voltage to 48V and line current to 40mA. 3. Input -45dBm/1KHz to MIC and measure Line output level. 4. Confirm that the level is -7.5dBm ± 2dBm and that the distortion level is < 5% at TEL Line (600Ω Load). 5. Input -20dBm/1KHz to Line I/F and measure Receiving level at REV1 and REV2. 6. Confirm that the level is -20.5dBm ± 2dBm and that the distortion level is < 5% at Receiver. (vol = 2)	IC1, C37, C68, C91, R25, R26, C20, C12, C87, C109, R85, C103, C10, C17, R86, R29, R37, R38, D4, D5, C69, C70, C95

	Items	Check Point	Procedure	Check or Replace Parts
(**T**)	SP phone Audio Check and Confirmation	-	1. Link to Base which is connected to Line Simulator. 2. Set line voltage to 48V and line current to 40mA. 3. Set the handset off-hook using SP-Phone key. 4. Input -25dBm/1KHz to Line I/F and measure Receiving level at SP1 and SP2. 5. Confirm that the level is -15.5dBm ± 2dBm and that the distortion level is < 5%. (vol = 3)	IC1, C37, C68, C91, R25, R26, C20, C12, C87, C109, R85, C103, C10, C17, R86, R29, R37, R38, L6, L7, C79, C78

16.2. Troubleshooting for Speakerphone

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

Conditions

1. When customer's line has less line loss.

   ex.) The customer is using optical fiber, ISDN terminal adaptor, or PBX.

   In this case, receiving signal is strong and it may affect transmission signal.

2. When the other party is talking from noisy place.

   ex.) The other party is using cellular phone. The background noise is very loud.

   In this case, the noise from the other party (i.e. surrounding noise) may affect transmission signal.

Setting Method

- Change the address of EEPROM (0×0144) from 0×00 to 0×01.

16.3. The Setting Method of JIG (Handset)

16.3.1. Preparation

16.3.1.1. Equipment Required

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

16.3.1.2. JIG and PC

- EEPROM serial JIG
  JIG Cable: PQZZ1CD300E*
- PC which runs in DOS mode.
- **Batch file** for PC setting: PQZZTCD220SL

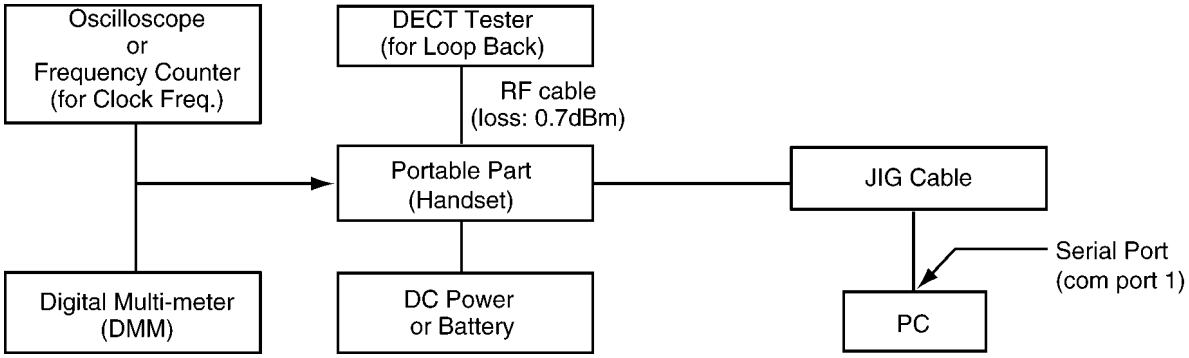
Note:

*: 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

16.3.2. PC Setting

16.3.2.1. Connections



16.3.2.2. PC Setting

1. Open a window of MS-DOS mode from the start-up menu.
2. Change a directory.
3. Type “**SET_COM=1**” from the keyboard (when COM port 1 is used for the connection).
4. Type “doskey”.

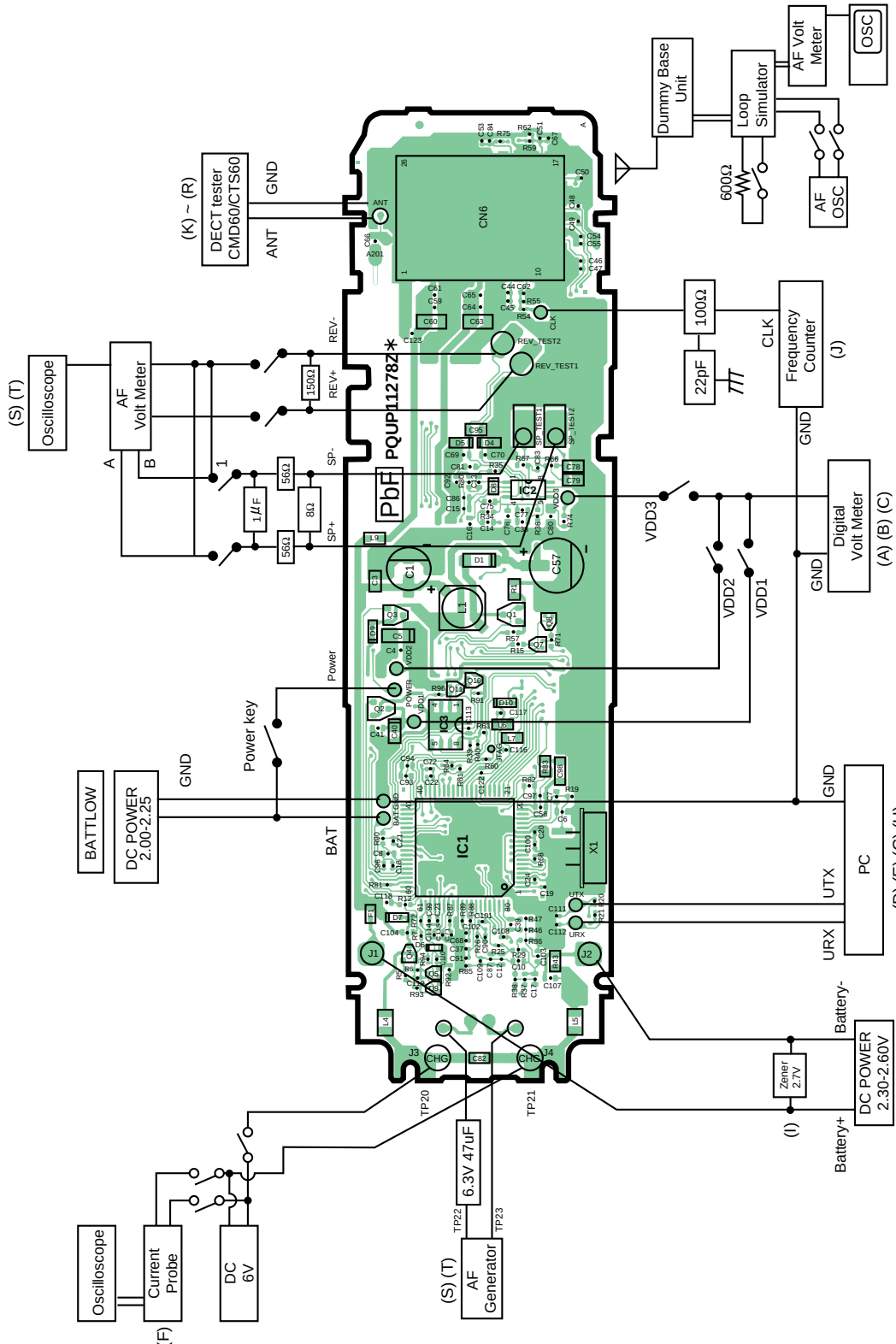
Note:

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”.
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.

16.4. Adjustment Standard (Handset)

When connecting the Simulator Equipment for checking, please refer to below.



Note:

(**A**) - (**T**) is referred to **Check Point (Handset)** (P.60)

17 THINGS TO DO AFTER REPLACING IC

Cautions:

Since this page is common to each country, it may not apply to some models in your country. The contents below are the minimum adjustments required for operation.

17.1. Base Unit

IC		Necessary Adjustment
BBIC	Programs for Voice processing, interface for RF and EEPROM	1. Default batch file: Execute the command “default”. 2. Country version batch file: Execute the command “TCD220XXrevYY”. (*1) 3. Clock adjustment: Refer to Check Point (F). (*2)
EEPROM	Adjustment parameter data (country version batch file, default batch file, etc.)	1. Change the address “0000” of EEPROM to “AA”. 2. Default batch file: Execute the command “default”. 3. Country version batch file: Execute the command “TCD220XXrevYY”. (*1) 4. Clock adjustment: Refer to Check Point (F). (*2)
FLASH 1	Voice prompt data (vary depending on country version)	No need to adjust

Note:

(*1) XX: country code, YY: revision number

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

(*2) Refer to **Check Point (Base Unit)** (P.53)

17.2. Handset

IC		Necessary Adjustment
BBIC	Programs for Voice processing, interface for RF and EEPROM	1. Default batch file: Execute the command “default”. 2. Default batch file (remaining); Execute the command “TCA121 DEFrevYY”. (*3) (Except for KX-TCA121/122 FX and KX-TCA121/122 RU). 3. Country version batch file: Execute the command “TCA121XXrevYY”. (*3) 4. Clock adjustment: Refer to Check Point (J). (*4) 5. 1.8 V setting and battery low detection: Refer to Check Point (A), (H) and (I). (*4)
EEPROM	Adjustment parameter data (country version batch file, default batch file, etc.)	1. Change the address “0015” of EEPROM to “55”. 2. Default batch file: Execute the command “default”. 3. Default batch file (remaining): Execute the command “TCA121DEFrevYY”. (*3) (Except for KX-TCA121/122 FX and KX-TCA121/122 RU). 4. Country version batch file: Execute the command “TCA121XXrevYY”. (*3) 5. Clock adjustment: Refer to Check Point (J). (*4) 6. 1.8 V setting and battery low detection: Refer to Check Point (A), (H) and (I). (*4)

Note:

(*3) XX: country code, YY: revision number

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

(*4) Refer to **Check Point (Handset)** (P.60)

18 RF SPECIFICATION

18.1. Base Unit

Item	Value	Refer to -. *	Remarks
TX Power	20 dBm ~ 25 dBm	**Check Point (Base Unit) (I)**	
Modulation	-350 ~ -400/+320 ~ +370 kHz/div	**Check Point (Base Unit) (J)**	Data type: Fig31
Frequency Offset	-45 kHz ~ +45 kHz	**Check Point (Base Unit) (K)**	
Frequency Drift	< ± 30 kHz / ms	**Check Point (Base Unit) (L)**	
RX Sensitivity	< 1000 ppm	**Check Point (Base Unit) (M)**	
Timing Accuracy	< ± 2.0 ppm	**Check Point (Base Unit) (N)**	
RSSI Level	0x22 hex ± A hex	**Check Point (Base Unit) (O)**	
Power RAMP	Power RAMP is matching	**Check Point (Base Unit) (P)**	

*: Refer to **Check Point (Base Unit)** (P.53)

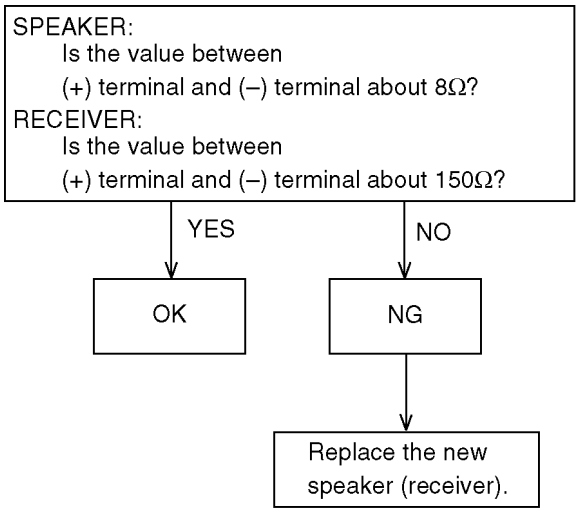
18.2. Handset

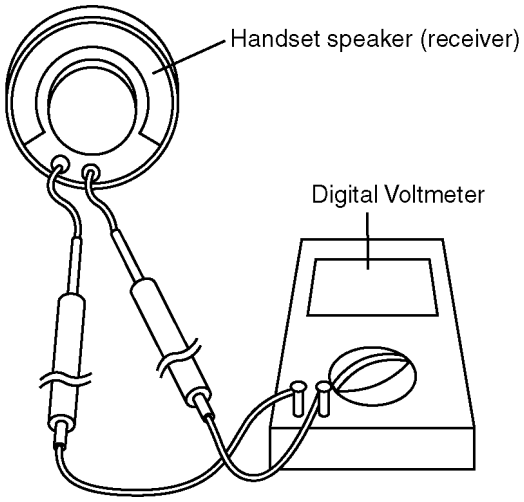
Item	Value	Refer to -. **	Remarks
TX Power	20 dBm ~ 25 dBm	**Check Point (Handset) (K)**	
Modulation	-350 ~ -400/+320 ~ +370 kHz/div	**Check Point (Handset) (L)**	Data type: Fig31
Frequency Offset	-45 kHz ~ +45 kHz	**Check Point (Handset) (M)**	
Frequency Drift	< ± 30 kHz / ms	**Check Point (Handset) (N)**	
RX Sensitivity	< 1000 ppm	**Check Point (Handset) (O)**	
Timing Accuracy	< ± 2.0 ppm	**Check Point (Handset) (P)**	
RSSI Level	0x1C hex ± 8 hex (at -81dBm) 0x25 hex ± 8 hex (at -63dBm)	**Check Point (Handset) (Q)**	
Power RAMP	Power RAMP is matching	**Check Point (Handset) (R)**	

: Refer to **Check Point (Handset) (P.60)

19 HOW TO CHECK THE HANDSET SPEAKER OR RECEIVER

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





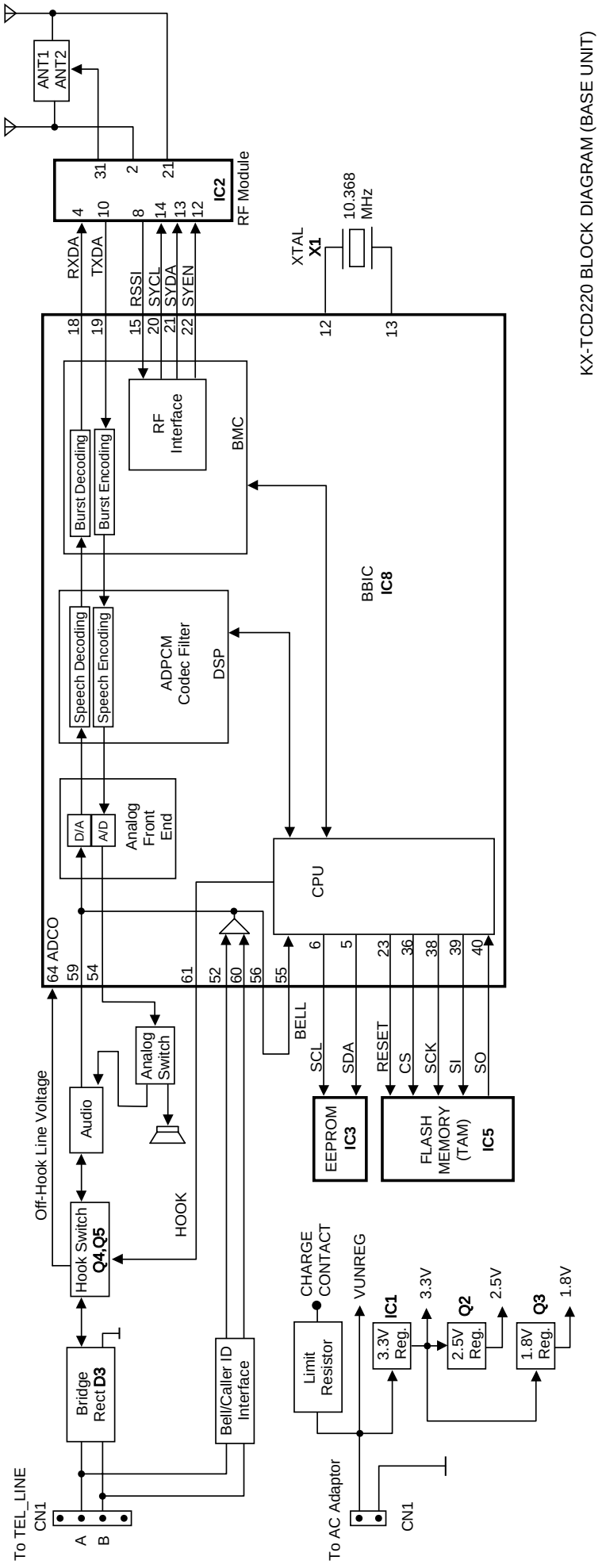
20 FREQUENCY TABLE (MHz)

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

Note:

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

21 BLOCK DIAGRAM (BASE UNIT)



KX-TCD220 BLOCK DIAGRAM (BASE UNIT)

22 CIRCUIT OPERATION (BASE UNIT)

22.1. Outline

Base Unit consists of the following ICs as shown in **BLOCK DIAGRAM (BASE UNIT)** (P.70).

- DECT BBIC (**B**ase **B**and IC): IC8
  - Handling all the audio, signal and data processing needed in a DECT base unit
  - Controlling the DECT specific physical layer and radio section (**B**urst **M**odule **C**ontroller section)
  - ADPCM codec 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: IC2
  - PLL Oscillator
  - Detector
  - Compress/Expander
  - First/Second Mixer
  - Amplifier for transmission and reception
- EEPROM: IC3
  - Temporary operating parameters (for RF, etc.)
- Additionally,
  - Power Supply Circuit (+3.3V, +2.5V, +1.8V output)
  - Crystal Circuit (10.368MHz)
  - Charge Circuit
  - Telephone Line Interface Circuit
- FLASH MEMORY: IC5
  - Voice Prompt (TAM) D/L Area
  - ICM/OGM/MEMO recording area

22.2. Power Supply Circuit

The power is supplied to the DECT BBIC, RF Module, EEPROM and Charge Contact from AC Adaptor (+6V) as shown in Fig.101. The power supply is as follows;

- DECT BBIC (IC8):

  CN1 (+6V) → D1 → IC1 → Q2 → IC8

- RF Module (IC2):

  CN1 (+6V) → D1 → IC1 → Q2 → IC2 (PLL)

  CN1 (+6V) → D1 → IC1 → IC2 (Power AMP)

- EEPROM (IC3):

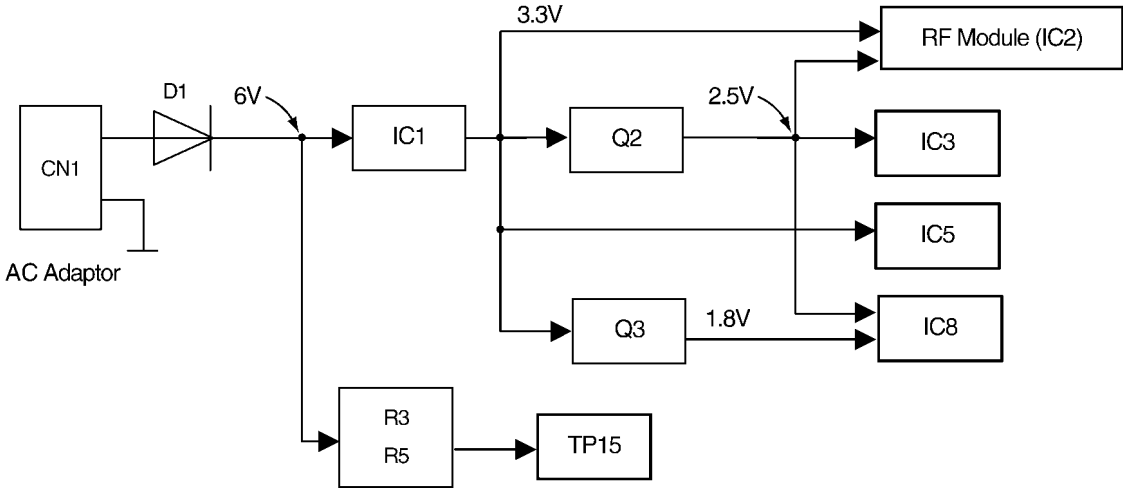
  CN1 (+6V) → D1 → IC1 → Q2 → IC3

- FLASH MEMORY (IC5):

  CN1 (+6V) → D1 → IC1 → IC5

- Charge Contact (TP15):

  CN1 (+6V) → D1 → R3, R5 → TP15



<Fig.101>

22.3. Telephone Line Interface

<Function>

- Bell signal detection
- Clip signal detection
- ON/OFF hook circuit
- Audio circuits
- DTMF tone signal circuits

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

In the standby mode, Q4 is open to cut the DC loop current and decrease the ring load.

When ring voltage appears at the TP2 (A) and TP3 (B) leads (when the telephone rings), the AC ring voltage is transferred as follows;

- A → C13 → R17 → R24 → IC8 Pin 60 (CID INp)
- B → C12 → R16 → R32 → IC8 Pin 52 (CID INn)

ON/OFF hook circuit:

In the standby mode, Q4 is open, and connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an **off-hook condition**.

When IC2 detects a ring signal or press the TALK Key onto the handset, Q5 turns on and then Q4 turns on, thus providing an **off-hook condition** (active DC current flow through the circuit) and the following signal flow is for the loop current.

- A → D3 → Q4 → Q8 → R45 → R46 → D3 → B [**OFF HOOK**]

22.4. Transmitter/Receiver

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

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

Signal Path:

*Refer to **SIGNAL ROUTE** (P.77).

22.4.1. Transmitter Block

The voice signal input from the TEL LINE interface goes to RF Module (IC2) through DECT BBIC (IC8) as shown in **BLOCK DIAGRAM (BASE UNIT)** (P.70)

The voice signal passes through the analog part of IC8 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.

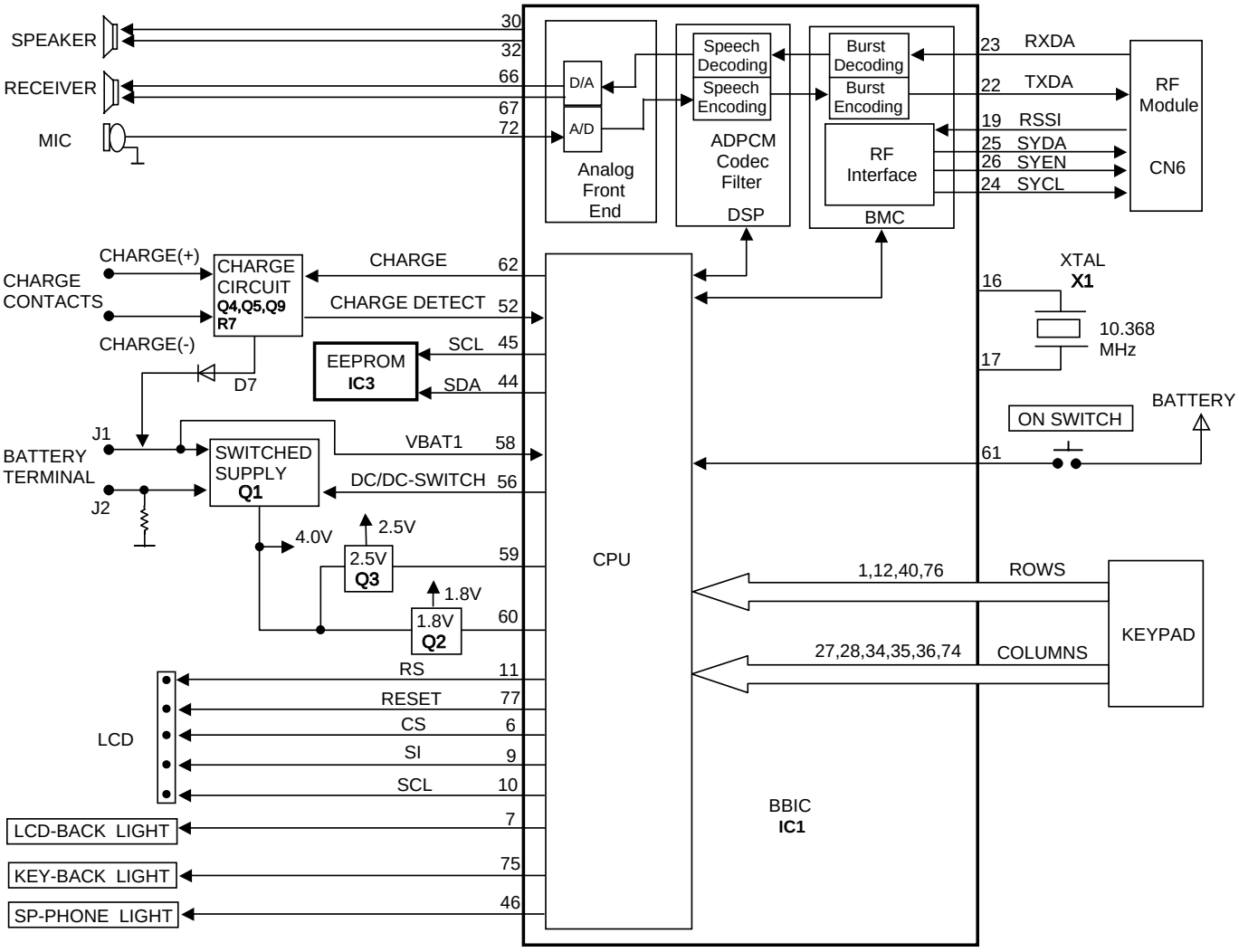
In IC2, the carrier frequency is changing, and frequency modulated RF signal is generated and amplified, and radiated from antenna. Handset detects the voice signal or data signal in the circuit same as the following explanation of Receiver Block.

22.4.2. Receiver Block

The signal of 19.2 MHz band (18.81792 MHz ~ 18.97344 MHz) which is input from antenna is input to IC2 as shown in **BLOCK DIAGRAM (BASE UNIT)** (P.70).

In IC2, the signal of 19.2 MHz band is downconverted to 864 kHz signal and demodulated, and goes to IC8 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.

23 BLOCK DIAGRAM (HANDSET)



KX-TCA122/121 BLOCK DIAGRAM (HANDSET)

24 CIRCUIT OPERATION (HANDSET)

24.1. Outline

Handset consists of the following ICs as shown in **BLOCK DIAGRAM (HANDSET)** (P.74).

- 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 Module: CN6
  - PLL Oscillator
  - Detector
  - Compress/Expander
  - Amplifier for transmission and reception
- EEPROM: IC3
  - Temporary operating parameters (for RF, etc.)

24.2. Power Supply Circuit/Reset Circuit

Circuit Operation:

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

BATTERY(2.2 V ~ 2.6 V: J1) → L1, D1 → Q2 (1.8 V), Q3 (2.5 V), Q1 (3.3 V)

The Reset signal generates IC1 (53 pin) and 1.8 V.

24.3. Charge Circuit

Circuit Operation:

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

DC+(5.5V ~ 6V) → D1 → R4, R5 → CHARGE+(Base) → CHARGE+(Handset) → L4 → Q4 → D7→ F1 → BATTERY+... Battery... BATTERY- → R43 → GND → L5 → CHARGE-(Handset)→ CHARGE-(Base) → GND → DC-(GND)

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

The charge current is controlled by switching Q5 of Handset.

Refer to Fig.101 in **Power Supply Circuit** (P.72).

24.4. 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) ≦ 2.25V ± 50mV

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

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

  The BBIC detects this level and power down.

  Refer to **Check Point (Handset)** (P.60).

24.5. Speakerphone

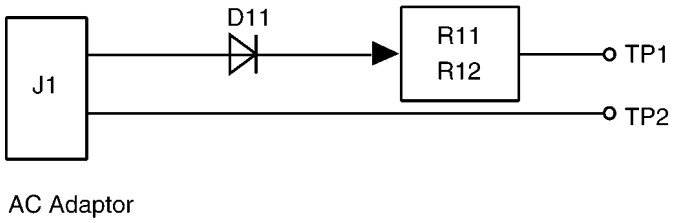
The hands-free loudspeaker at SP+ and SP- is used to generate the ring alarm.

Refer to **Troubleshooting for Speakerphone** (P.64).

25 CIRCUIT OPERATION (CHARGER UNIT)

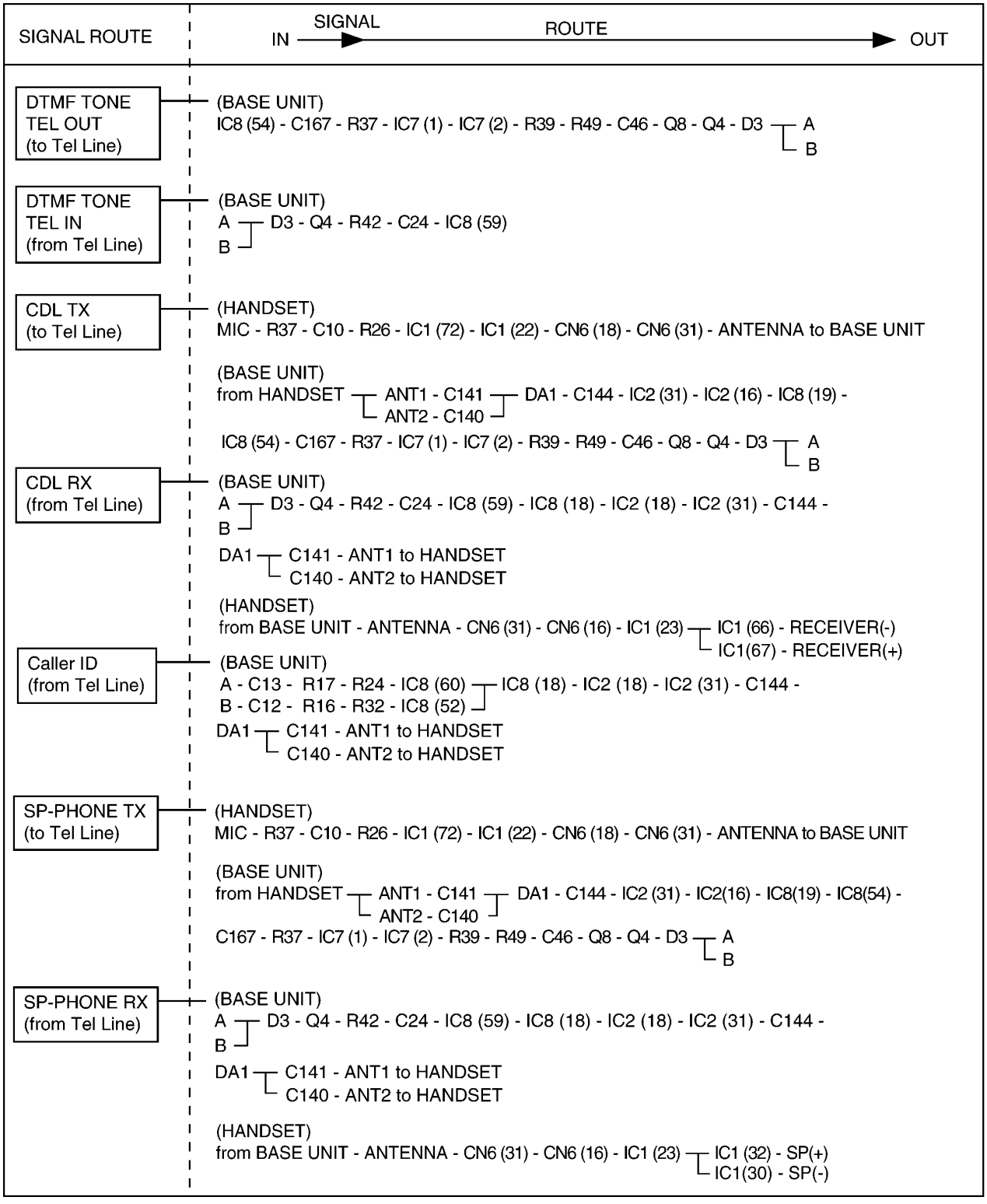
25.1. Power Supply Circuit

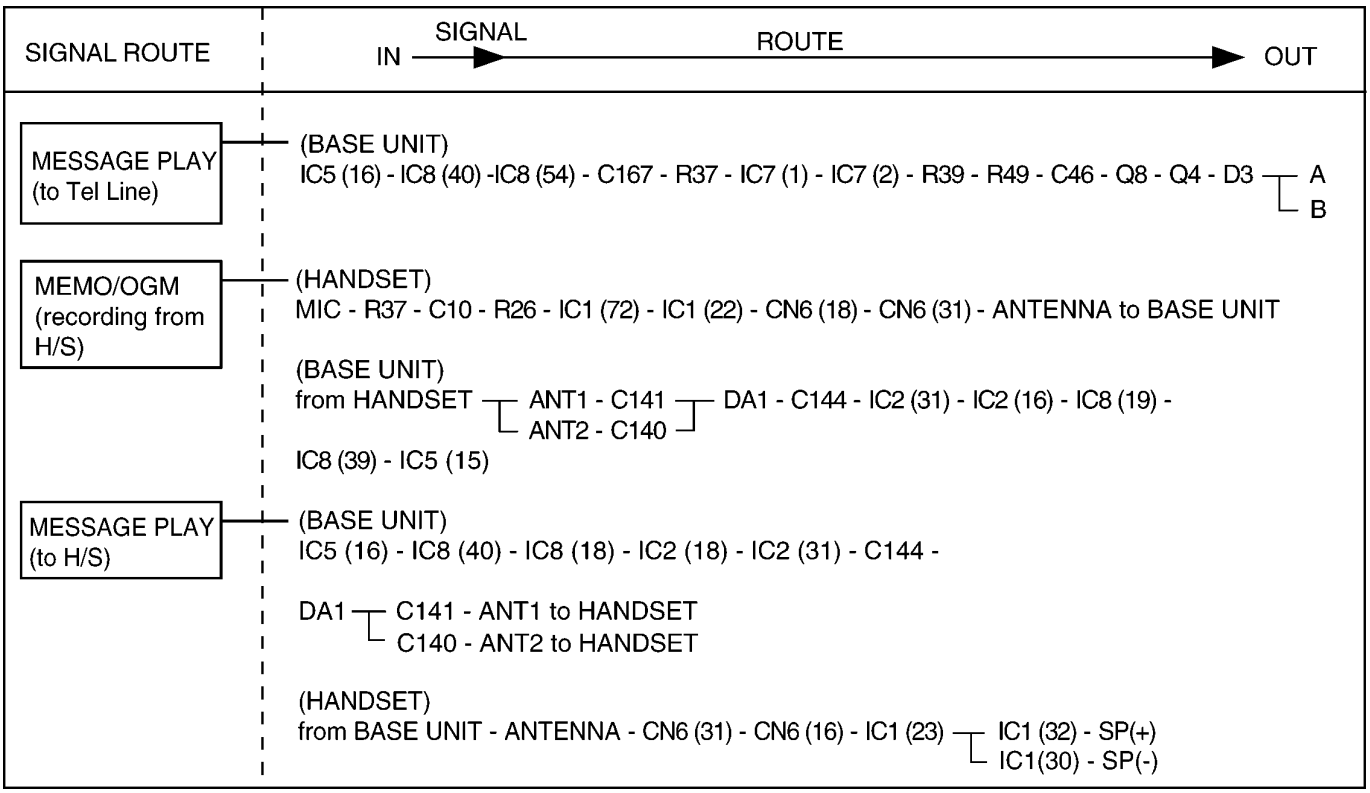
The power supply is as shown.



AC Adaptor

26 SIGNAL ROUTE




SIGNAL ROUTE
SIGNAL
IN
ROUTE
OUT
MESSAGE PLAY (to Tel Line)
(BASE UNIT)
IC5 (16) - IC8 (40) -IC8 (54) - C167 - R37 - IC7 (1) - IC7 (2) - R39 - R49 - C46 - Q8 - Q4 - D3 - A
B
MEMO/OGM (recording from H/S)
(HANDSET)
MIC - R37 - C10 - R26 - IC1 (72) - IC1 (22) - CN6 (18) - CN6 (31) - ANTENNA to BASE UNIT
(BASE UNIT)
from HANDSET - ANT1 - C141 - DA1 - C144 - IC2 (31) - IC2 (16) - IC8 (19) -
ANT2 - C140
IC8 (39) - IC5 (15)
MESSAGE PLAY (to H/S)
(BASE UNIT)
IC5 (16) - IC8 (40) - IC8 (18) - IC2 (18) - IC2 (31) - C144 -
DA1 - C141 - ANT1 to HANDSET
C140 - ANT2 to HANDSET
(HANDSET)
from BASE UNIT - ANTENNA - CN6 (31) - CN6 (16) - IC1 (23) - IC1 (32) - SP(+)
IC1(30) - SP(-)

27 CPU DATA (BASE UNIT)

27.1. IC8 (BBIC)

Pin No	Description	I/O	Connection	at Normal mode	at Reset mode
1	INT1n/P1_1	D,O	RLY	O	I-PU
2	VDDIO	-	-	-	-
3	VDD	-	-	-	-
4	VSS	-	-	-	-
5	SDA1/P2_5	D,I/O	SDA	I/O	I
6	SCL1/P2_4	D,O	SCL	O	I
7	INT5n/P1_5	D,O	NC	O-L	I-PU
8	INT2n/P1[2]	D,O	P1[2]		
9	AVD	-	-	-	-
10	AVS	-	-	-	-
11	CAP	A,I	CAP	I	I
12	Xtal1	A,I	Xtal1	I	-
13	VSSRF	-	-	-	-
14	RFCLKp	A,I	NC	O	Hi-Z
15	RSSI/RFCLKm	A,I	RSSI	I	Hi-Z
16	VDDRF	-	-	-	-
17	RFCLKd	D,O	RFCLKd	O	O-L
18	TDO	A,O	TDO	O	-
19	RDI	D,I	RDI	I	I
20	SK	D,I/O	SK	-	O-L
21	PD1/SIO	D,I/O	SIO	-	I-PD
22	LE	D,I/O	LE	O	O-H
23	P3[1]/PD1	D,I/O	P3[1]	O	I-PD
24	P3[2]/PD2	D,I/O	P3[2]	O	I-PD
25	P3[3]/PD3	D,I/O	P3[3]	O	I-PD
26	P3[4]/PD4	D,I/O	P3[4]	O	I-PD
27	TDOD/P3[5]/PD5	D,I/O	P3[5]	O	I-PD
28	P3[6]/PD6	D,O	NC	O	I-PD
29	VSS	-	-	-	-
30	VDDIO	-	-	-	-
31	VDD	-	-	-	-
32	PCM_FSC/INT0n/P1[0]	D,I/O	INT0n	O	I-PU
33	P0[0]/UTX	D,I/O	UTX	O	I-PU
34	P0[1]/URX	D,I/O	URX	O	I-PU
35	P0[2]/JTIO	D,I/O	JTIO	O	I-PU
36	P0[3]/SDA2	D,I/O	P0[3]	O	I-PU
37	P0[4]/SCL2	D,I/O	P0[4]	O	I-PU
38	P0[5]/SPICLK/PCM_CLK	D,I/O	SPICLK	O	I-PU
39	P0[6]/SPIDO/PCM_DOUT	D,I/O	SPIDO	O	I-PU
40	P0[7]/SPIDI/PCM_DIN	D,I/O	SPIDI	O	I-PU
41	VSS	-	-	-	-
42	VDD	-	-	-	-
43	P2[3]/ADC1	I	ADC1	I	I
44	P1[7]/CHARGE/INT7	I	CHARGE	I	I-PD
45	RSTn	I	RSTn	I	I-PU
46	VBAT1	A,I	VBAT1	I	I
47	LDO1_CTRL	D,O	LDO1_CTRL	O	O-H
48	LDO2_CTRL	D,O	LDO2_CTRL	O	O-H
49	LDO1_Sense	D,I	LDO1_Sense	I	O-L
50	AVS2	-	-		-
51	AVD2	-	-	-	-
52	CIDINn	A,I	CIDINn	I	I
53	LSRn/REF	A,O	REF	O	O
54	LSRp/REF	A,O	LSRp	O	O
55	RINGING	A,I	RINGING	I	I
56	MICn/CIDOUT	A,I	CIDOUT	O	O
57	VREFm	-	-	-	-
58	AGND	A,O	AGND	O	O
59	MICp	A,I	MICp	I	I
60	CIDINp	A,I	CIDINp	I	I
61	P1[4]/INT4n	D,I/O	P1[4]	I	I
62	P1[3]/INT3n	D,I/O	P1[3]	I	I

Pin No	Description	I/O	Connection	at Normal mode	at Reset mode
63	ADC2	A,I	ADC2	I	I
64	ADC0	A,I	ADC0	I	I

28 CPU DATA (HANDSET)

28.1. IC1 (BBIC)

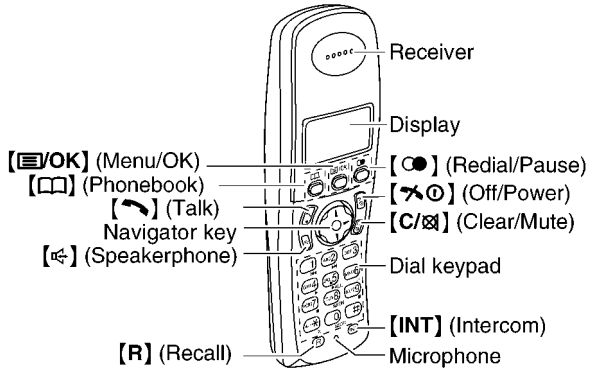
Pin No	Description	I/O	Connection	at Normal mode	at Reset mode
1	INTln/P1[1]	D,I	ROW1	I	I-PU
2	VDDIO	-	-	-	-
3	VDD	-	-	-	-
4	VSS	-	-	-	-
5	LED1/PWM0/P2[0]	D,O	PWM0	O-L	I-PU
6	LED2/PWM1/P2[1]	D,O	LCD_CSB	O-H	I-PU
7	LED3	A,I	LED_BKL	I	I
8	LED_BIAS/P3[6]/PD	A.O	LED_BIAS	O	I-PD
9	SDA1/P2[5]	D,I/O	LCD_SI	I/O	I
10	SCL1/P2[4]	D,O	LCD_SCL	O	I
11	INT5n/VDDE/P1[5]	D,O	LCD_RS	O-L	I-PU
12	INT2n/P1[2]	D,I	ROW2	I	I-PU
13	AVD	-	-	-	-
14	AVS	-	-	-	-
15	CAP	A,I	CAP	I	I
16	Xta11	A,I	Xtal1	I	-
17	VSSRF	-	-	-	-
18	RFCLKp	A,O	NC	O	Hi-Z
19	RSSI/RFCLKm	A,I	RSSI	I	Hi-Z
20	VDDRF	-	-	-	-
21	RFCLKd	D,O	RFCLKd	O	O-L
22	TDD	A,O	TDO	O	-
23	RDI	D,I	RDI	I	I
24	SK	D,I/O	SK	-	O-L
25	PD1/SIO	D,I/O	SIO	-	I-PD
26	LE	D,I/O	LE	O-L	O-H
27	P3[1]/PD1	D,I/O	COL1	O-L	I-PD
28	P3[2]/PD2	D,I/O	COL2	O-L	I-PD
29	VSSPA	-	-	-	-
30	PAOUTm	D,O	PAOUTm	O	O
31	VDDPA	-	-	-	-
32	PAOUTp	D,O	PAOUTp	O	O
33	VSSPA	-	-	-	-
34	P3[3]/PD3	D,I/O	COL3	O-L	I-PD
35	P3[4]/PD4	D,I/O	COL4	O-L	I-PD
36	TDOD/P3[5]/PD5	D,I/O	COL5	O-L	I-PD
37	VSS	-	-	-	-
38	VDDIO	-	-	-	-
39	VDD	-	-	-	-
40	PCM_FSC/INT0n/P1[0]	D,I	ROW0	I	I-PU
41	P0[0]/UTX	D,I/O	UTX	O	I-PU
42	P0[1]/URX	D,I/O	URX	O	I-PU
43	P0[2]/JTIO	D,I/O	JTIO	O	I-PU
44	P0[3]/SDA2	D,I/O	P0[3]	O	I-PU
45	P0[4]/SCL2	D,I/O	P0[4]	O	I-PU
46	P0[5]/SPICLK/PCM	D,I/O	SP_LED	O	I-PU
47	P0[6]/SPIDO/PCM_D	D,O	CD_AMP	O	I-PU
48	P0[7]/SPIDI/PCM_D	D,I/O	RESET	O	I-PU
49	VSS	-	-	-	-
50	VDD	-	-	-	-
51	P2[3]/ADC1	O	EEP_WP	O	O
52	P1[7]/CHARGE/INT7	I	CHARGE	I	I-PD
53	RSTn	I	RSTn	I	I-PU
54	DC_stab	O	DC_stab	O	O
55	DC_1	I	DC_I	I	I
56	DC_CTRL	O	DC_CTRL	O	O-PD
57	DC_Sence	I	DC_Sence	I	I
58	VBAT1	A,I	VBAT1	I	I
59	LDO1_CTRL	D,O	LDO1_CTRL	O	O-H
60	LDO2_CTRL	D,O	LDO2_CTRL	O	O-H
61	P1[6]/PON/INT6	I	power_det	I	I-PD
62	P2[6]/stop_charge	A,O	stop_charge	O	O-O

Pin No	Description	I/O	Connection	at Normal mode	at Reset mode
63	LDO1_Sense	D,I	LDO1_Sense	I	O-L
64	AVS2	-	-	-	-
65	AVD2	-	-	-	-
66	LSRn/REF	A,O	REF	O	O
67	LSRp/REF	A,O	LSRp	O	O
68	MICn	A,I	RINGING	I	I
69	VREFm	-	-	-	-
70	VBUF	O	VBUF	O	O
71	AGND	A,O	AGND	O	O
72	MICp	A,I	MICp	I	I
73	VREFp	A,I	CIDINp	I	I
74	P3[0]	D,I/O	COL0	O-L	I-PD
75	P1[4]/INT4n	D,O	Key_LED	O	O-L
76	P1[3]/INT3n	D,I	ROW3	I	I
77	P2[2]/CLK100	D,O	LCD_RESET	O	I-PD
78	AVS_sence	I	AVS_sence	I	I
79	ADC2	A,I	ADC2	I	I
80	ADC0	A,I	NC	I	I

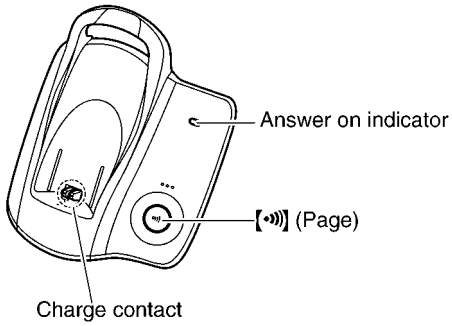
29 ENGINEERING MODE

29.1. Base Unit

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



Model shown is KX-TCA122.

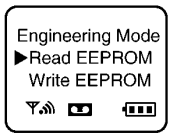


H/S key operation	H/S LCD
1). Register a Handset to a Base Unit.	
2). Press "【/OK】" (Menu/OK) key, then select "Base Unit Setup" by navigator key.	Ph.Book Setup Handset Setup ▶Base Unit Setup
3). Press "【/OK】" (Menu/OK) key, then select "Base Unit Setup" by navigator key.	Enter Base PIN :----
4). Enter "0", "0", "0", "0". **Note:** This 4 digits are default setting.	▶Ringer Setup Call Options Other Options
5). Select "Other Options".	Ringer Setup Call Options ▶Other Options
6). Press "【/OK】" (Menu/OK).	▶Base Unit PIN Repeater Mode Reset Base
7). Select "Base Unit PIN".	▶Base Unit PIN Repeater Mode Reset Base
8). Press "【/OK】" (Menu/OK).	Enter New PIN :----

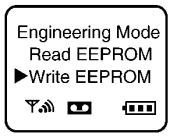
9). Enter "7", "2", "6", "2".

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

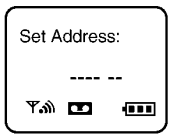
11). Press "【MENU/OK】" (Menu/OK).



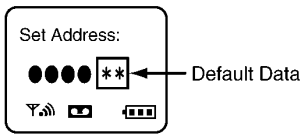
12). Select "Write EEPROM".



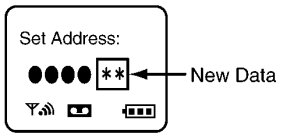
13). Press "【MENU/OK】" (Menu/OK).



14). Enter "●", "●", "●", "●" (Address). *



15). Enter "＊", "＊" (New Data).



16). Press "【MENU/OK】" (Menu/OK).
A long confirmation beep will be heard.

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

Note:

*: When you enter the address, please refer to the table below.

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

ex.)

Items (*2)	Address	Default Data	New Data		Remarks
C-ID (FSK) sensitivity	04 3D	00	01 (6dB up)	02 (12dB up)	When hex changes from “00” to “01” or “02”, gain increases by 6dB or 12dB.
C-ID (DTMF) sensitivity	04 4B	50	60 (6dB up)	70 (12dB up)	When hex changes from “50” to “60” or “70”, gain increases by 6dB or 12dB.
SMS (FSK) receiving sensitivity	04 3D	00	01 (6dB up)	02 (12dB up)	When hex changes from “00” to “01” or “02”, gain increases by 6dB or 12dB.
SMS (FSK) sending level	04 56/04 57	00/0B	00/16 (6dB up)	00/2C (12dB up)	When hex changes from “00 0B” to “00 16” or “00 2C”, gain increases by 6dB or 12dB.
Frequency	00 01	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 10~00 14	Given value	-	-	
Bell length	01 F6	32 (5sec) (*1)	1E (3sec)	14 (2sec)	This is time until bell stops ringing. (Unit: 100ms)

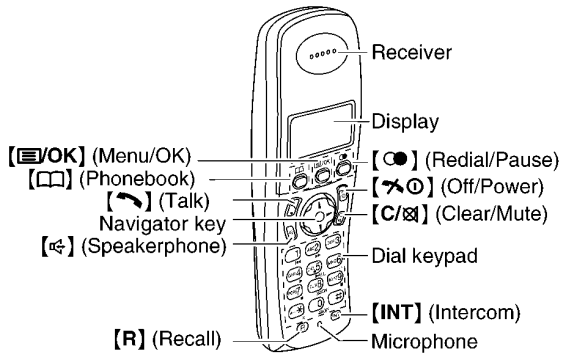
(*1) 32 (hex) = 50 (dec) → 50 × 100msec = 5000msec (5sec)

(*2)

Items	Description
C-ID (FSK) sensitivity	FSKGain_shiftgain
C-ID (DTMF) sensitivity	Foutgains:HPFilter Foutgains
SMS (FSK) receiving sensitivity	FSKGain_shiftgain
SMS (FSK) sending level	wFskAttn:Signal Output Attenuation (DSP parameter)
Frequency	Setting value of FREQ_TRIM_REG
ID	ID
Bell length	Time until it stops bell.

29.2. Handset

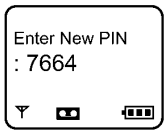
Important:
Make sure the address on LCD is correct when entering. Otherwise, you may ruin the unit.



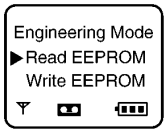
Model shown is KX-TCA122.

H/S key operation	H/S LCD
1). Press "【OK】" (Menu/OK) key, then select "Handset Setup" by navigator key.	Ph.Book Setup ▶Handset Setup Base Unit Setup
2). Press "【OK】" (Menu/OK).	▶Time Settings Ringer Setup Display Setup
3). Select "Other Options".	▶Other Options
4). Press "【OK】" (Menu/OK).	▶Handset PIN LetterWise Keytones
5). Select "Handset PIN".	▶Handset PIN LetterWise Keytones
6). Press "【OK】" (Menu/OK).	Enter Old PIN : ----
7). Enter "0", "0", "0", "0". **Note:** This 4 digits are default setting.	Enter New PIN : ----
8). Enter "7", "2", "6", "2".	Enter New PIN : 7262

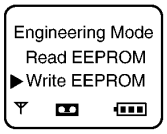
9). Enter "7", "6", "6", "4".
Note: 7262 7664 = PANA SONI
(see alphabets printed on dial keys)



10). Press "**[(☰)/OK]**" (Menu/OK).

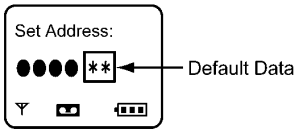


11). Select "Write EEPROM".

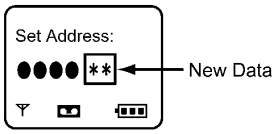


12). Press "**[(☰)/OK]**" (Menu/OK).

13). Enter "●", "●", "●", "●" (Address). *



14). Enter "＊", "＊" (New Data).



15). Press "**[(☰)/OK]**" (Menu/OK).
A long confirmation beep will be heard.

16). Press "**⏻**" (off) to return to standby mode.
After that, turn the handset power off and then power on.

Note:

*: When you enter the address, please refer to the table in **Note:** of **ENGINEERING MODE** (P.83).

ex.)

Items (*4)	Address	Default Data	New Data	Possible Adjusted Value MAX (hex)	Possible Adjusted Value MIN (hex)	Remarks
Sending level	00 06	Adjusted value	Given value	6F	00	(*1)
Receiving level	00 07	Adjusted value	Given value	00	3F	(*2)
Battery Low	00 04	25	-	-	-	(*3)
Frequency	00 01	75	-	-	-	
ID	00 10~00 14	Given value	-	-	-	

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

ex.)

Item	Default Data	New Data	
	3A	3E	36
Sending level	-7.5dBm	-6.5dBm	-8.5dBm

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

ex.)

Item	Default Data	New Data	
	14	18	10
Receiving level	-20.5dBm	-21.5dBm	-19.5dBm

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

(*4)

Items	Description
Sending level	Analog Front End MIC Setting for Handset Mode
Receiving level	Analog Front End LSR Setting for Handset Mode
Battery Low	ADC value for battery low detection
Frequency	Setting value of FREQ_TRIM_REG
ID	International Portable Part Equipment Identities

30 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.

30.1. 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)

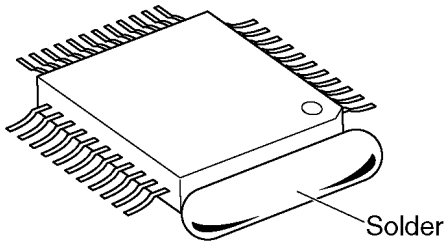
  Note: See **ABOUT LEAD FREE SOLDER (PbF: Pb free)** (P.4)

30.2. FLAT PACKAGE IC REMOVAL PROCEDURE

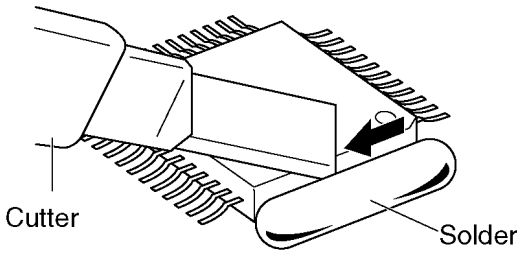
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

   Note:

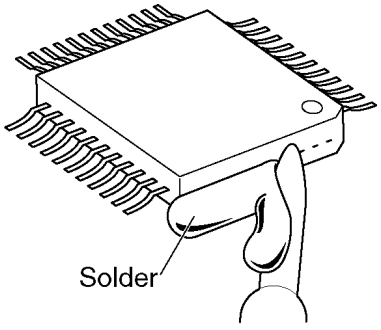
   If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



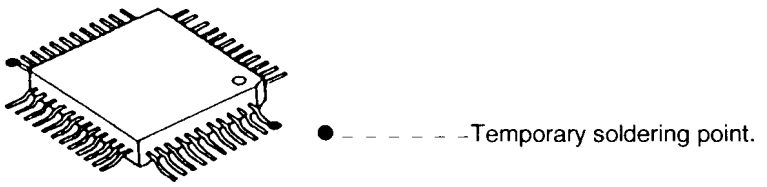
3. While the solder melts, remove it together with the IC pins.



When you attach a new IC to the board, remove all solder left on the land 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.

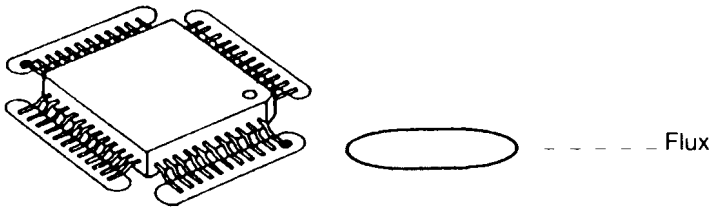
30.3. FLAT PACKAGE IC INSTALLATION PROCEDURE

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

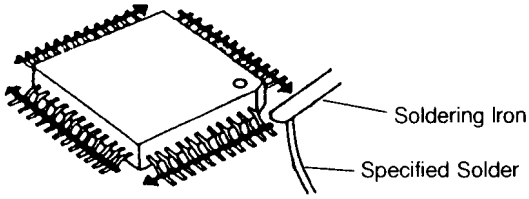


*Check the accuracy of the IC setting with the corresponding soldering foil.

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

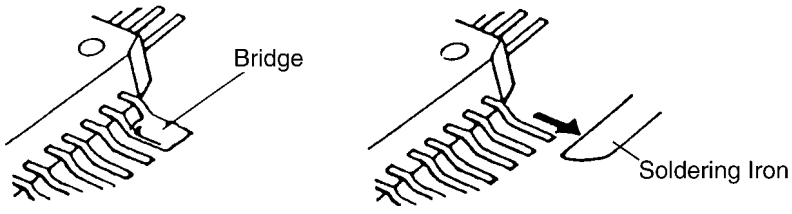


3. Solder the pins, sliding the soldering iron in the direction of the arrow.

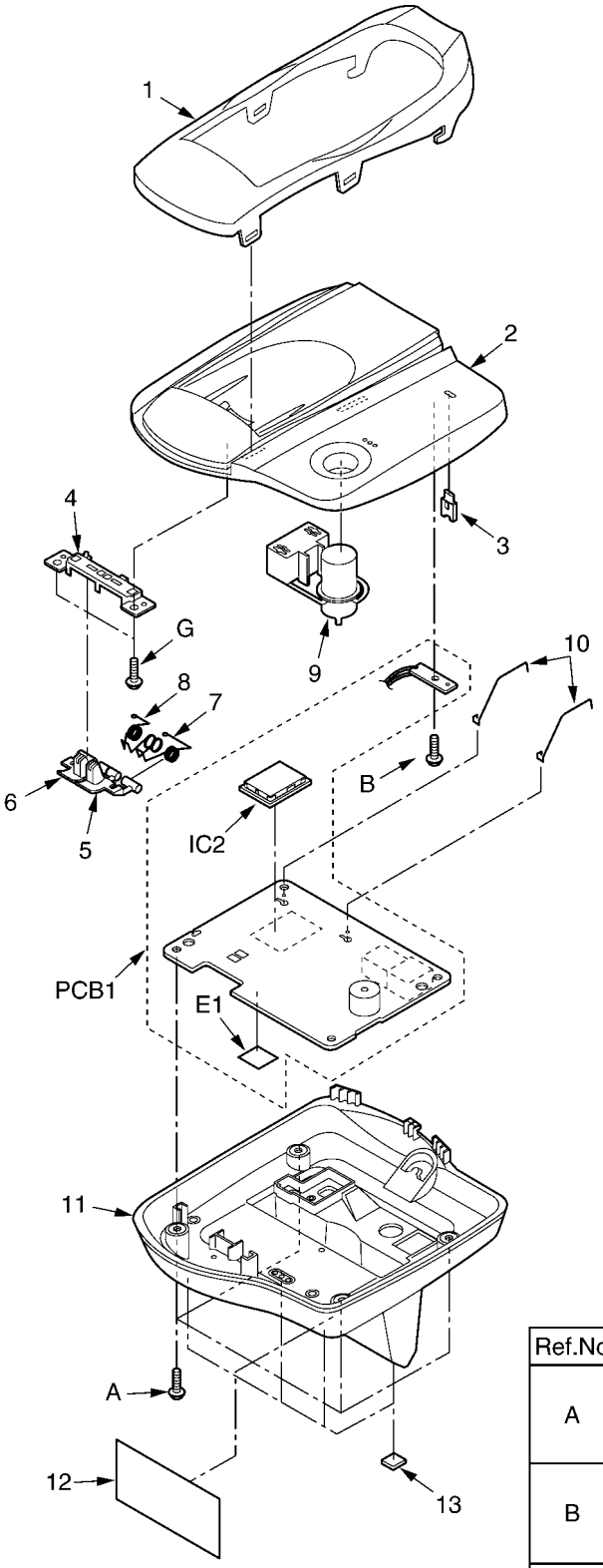


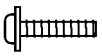
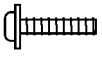
30.4. BRIDGE MODIFICATION PROCEDURE

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

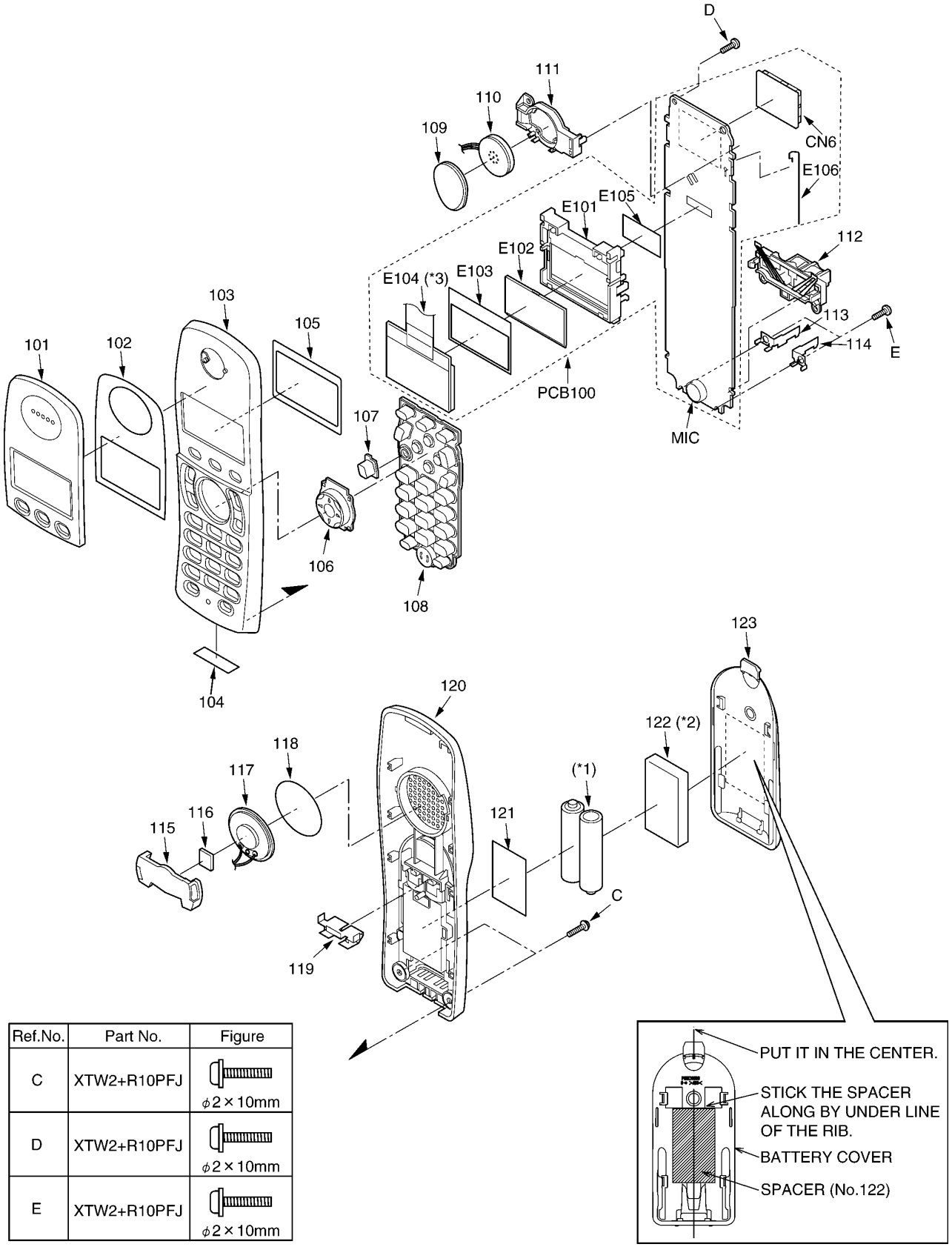


31 CABINET AND ELECTRICAL PARTS LOCATION (BASE UNIT)



Ref.No.	Part No.	Figure
A	PQHV2610PJ65	 ϕ2.6 × 10mm
B	PQHV2610PJ65	 ϕ2.6 × 10mm
G	PQHV2610PJ65	 ϕ2.6 × 10mm

32 CABINET AND ELECTRICAL PARTS LOCATION (HANDSET)



Ref.No.	Part No.	Figure
C	XTW2+R10PFJ	ϕ2×10mm
D	XTW2+R10PFJ	ϕ2×10mm
E	XTW2+R10PFJ	ϕ2×10mm

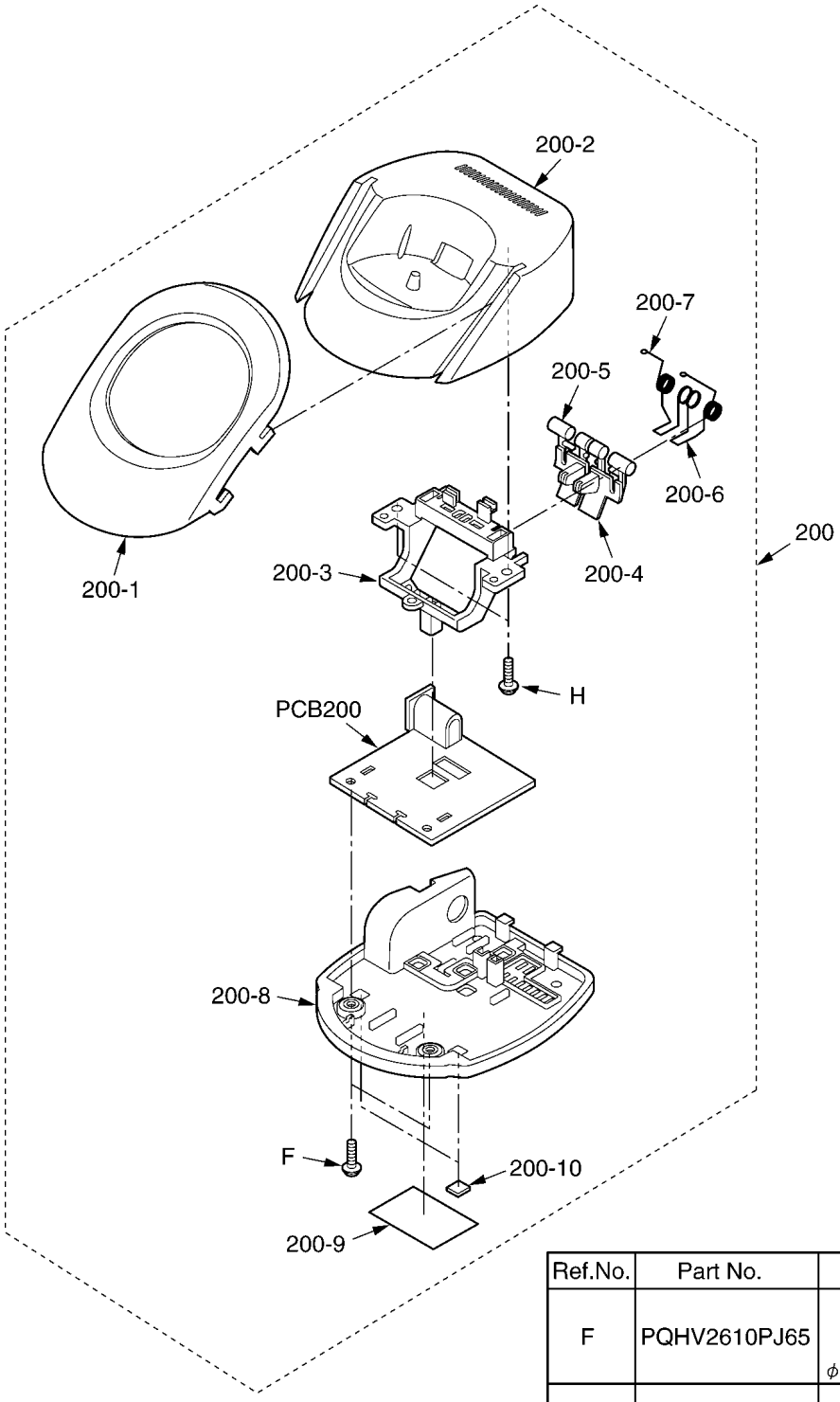
Note:

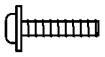
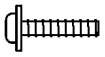
(*1) The rechargeable Ni-MH battery P03P (HHR-4EPT) is available through sales route of Panasonic.

(*2) Attach the spacer (No. 122) to the exact location described above.

(*3) This cable is fixed by welding. Refer to **HOW TO REPLACE THE HANDSET LCD** (P.43).

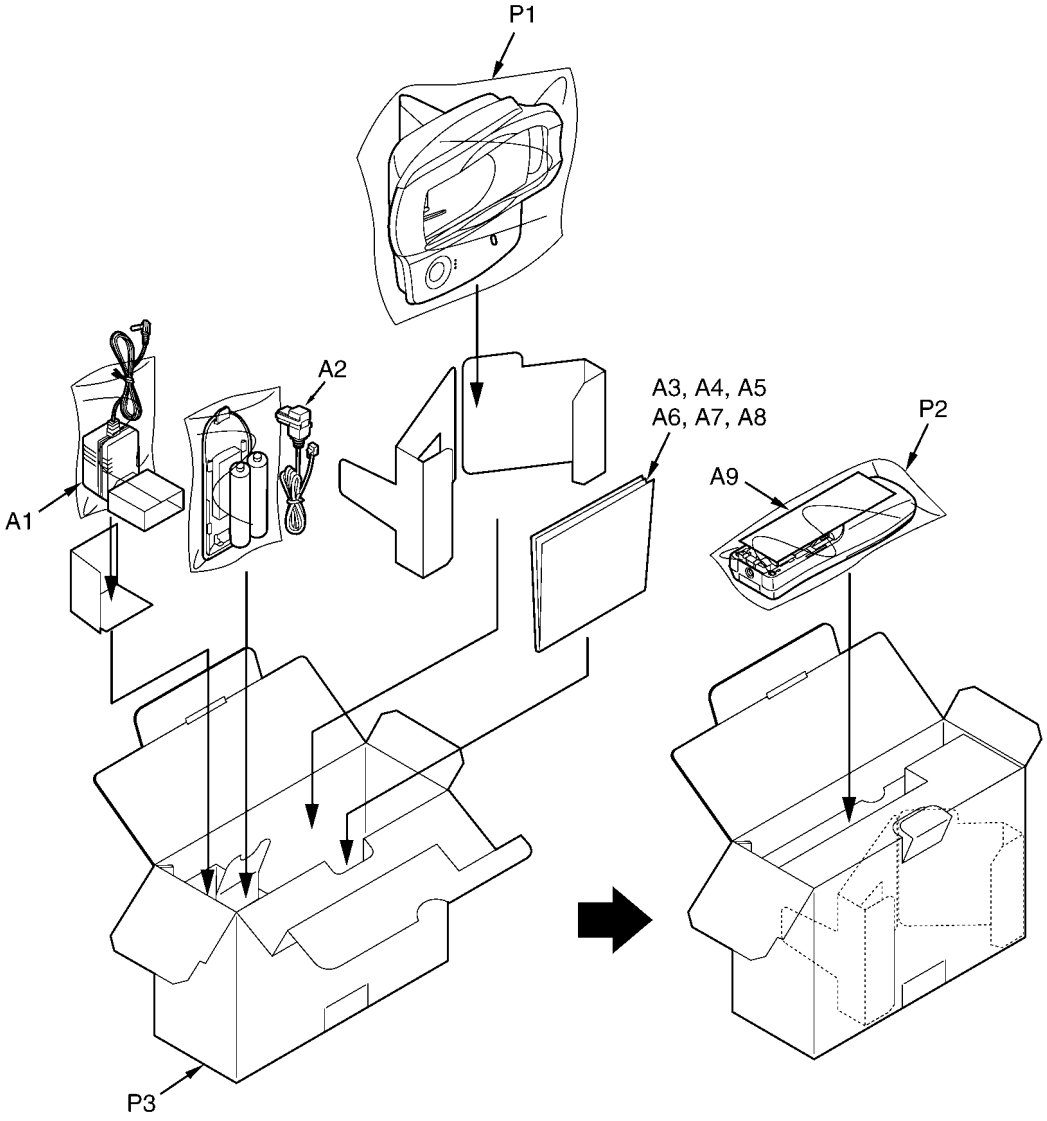
33 CABINET AND ELECTRICAL PARTS LOCATION (CHARGER UNIT)



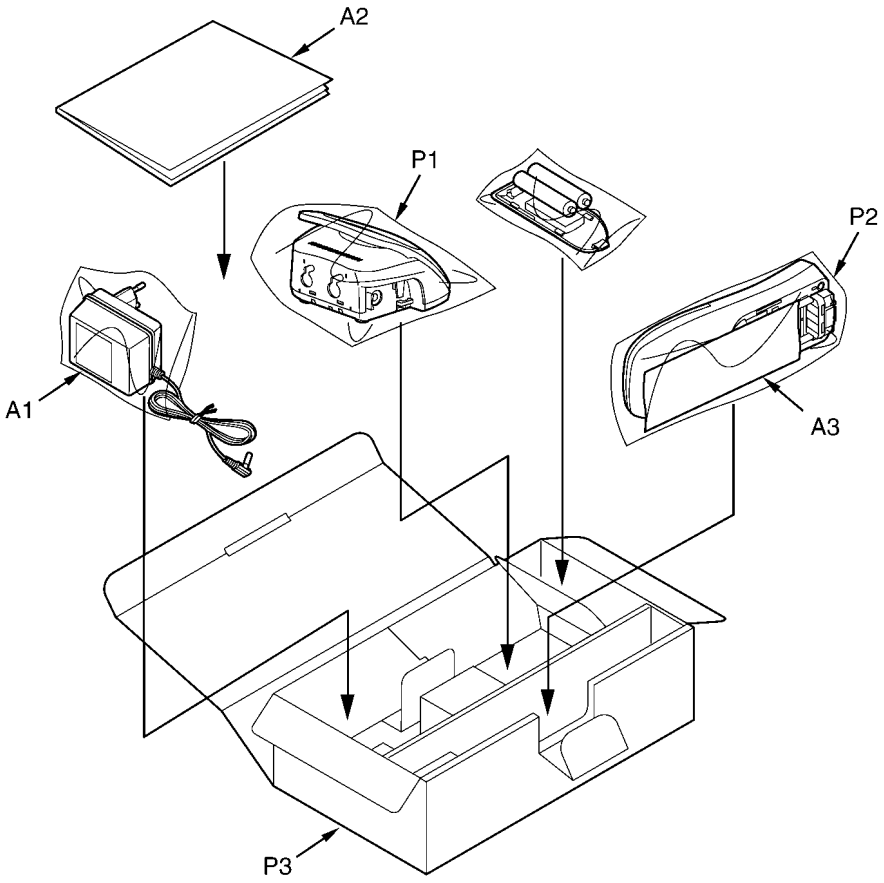
Ref.No.	Part No.	Figure
F	PQHV2610PJ65	 ϕ2.6 × 10mm
H	PQHV2610PJ65	 ϕ2.6 × 10mm

34 ACCESSORIES AND PACKING MATERIALS

34.1. KX-TCD220SLT

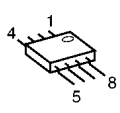


34.2. KX-TCA121EXT

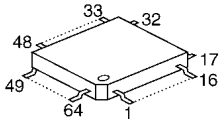


35 TERMINAL GUIDE OF THE ICs, TRANSISTORS AND DIODES

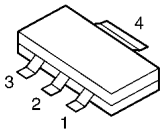
35.1. Base Unit



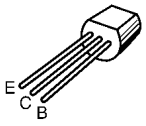
PQWICD300EH
C0JBAS000248



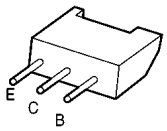
C1CB00002005



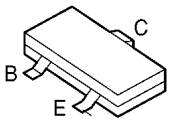
C0CBAYF00016



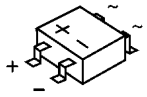
2SA1776P



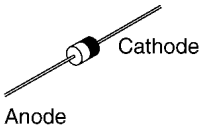
2SD1994A



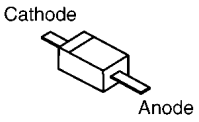
PQVTBF822T7, B1ADGE000004
B1ABGE000006, B1ABCF000103
PSVTDTC143X



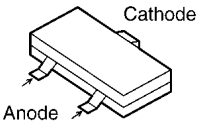
B0EDER000009



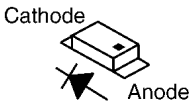
B0JAME000095



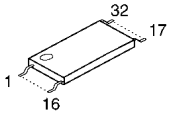
MA111
MA1Z300, MA8220



B0DDCM000001

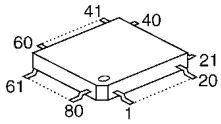


PQVDBR1111C

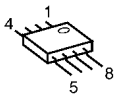


PQWI2D220SLH

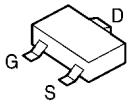
35.2. Handset



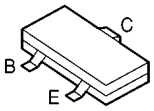
C1CB00001994



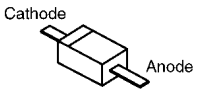
PQWI2A130EXR



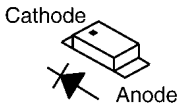
PQVTFDN335N



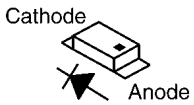
PSVTDTC143X, UN9219J
B1ADGE000004, B1ABCF000103



B0BC2R1A0006, MA8047
MA2Z72000,B0JCME000035

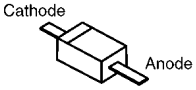


LNJ308G8JRA



PQVDBR1111C

35.3. Charger Unit



B0JCME000035

36 REPLACEMENT PARTS LIST

1. RTL (Retention Time Limited)

Note:

The marking (RTL) indicates that the Retention Time is limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly 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

36.1. Base Unit

36.1.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQGG10265Z3	GRILLE	PC-HB
2	PQKM10657Z3	CABINET BODY	PS-HB
3	PQHR11091Z	OPTIC CONDUCTIVE PARTS, LED LENS	ABS-HB
4	PQHR11057Z	CASE, CHARGE TERMINAL	PS-HB
5	PQKE10384Z1	HOLDER, CHARGE TERMINAL (R)	POM-HB
6	PQKE10385Z1	HOLDER, CHARGE TERMINAL (L)	POM-HB
7	PQJT10218Y	CHARGE TERMINAL (R)	
8	PQJT10219Y	CHARGE TERMINAL (L)	
9	PQBC10415Z1	PUSH BUTTON	ABS-HB
10	PQSA10154Z	ANTENNA	
11	PQKF10631Z3	CABINET COVER	PS-HB
12	PQGT17758X	NAME PLATE	
13	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	

36.1.2. Main P.C.Board Parts

Note:

(*1) When replacing IC3 or IC8, data need to be written to them with PQZZTCD220SL. Refer to **Base Unit** (P.67) of **THINGS TO DO AFTER REPLACING IC** .

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWPCD220SLH	MAIN P.C.BOARD ASS´Y (RTL)	
		(ICs)	
IC1	C0CBAYF00016	IC	
IC3	PQWICD300EH	IC (EEPROM) (*1)	
IC5	PQWI2D220SLH	IC (FLASH MEMORY)	
IC7	C0JBAS000248	IC	
IC8	C1CB00002005	IC (BBIC) (*1)	
		(TRANSISTORS)	
Q2	B1ADGE000004	TRANSISTOR(SI)	S
Q3	B1ADGE000004	TRANSISTOR(SI)	S
Q4	2SA1776P	TRANSISTOR(SI)	S
Q5	PQVTBF822T7	TRANSISTOR(SI)	
Q6	B1ADGE000004	TRANSISTOR(SI)	S
Q8	2SD1994A	TRANSISTOR(SI)	
Q14	PSVTDTC143X	TRANSISTOR(SI)	S
Q15	B1ABGE000006	TRANSISTOR(SI)	S
Q16	B1ABCF000103	TRANSISTOR(SI)	
		(DIODES)	
D1	B0JAME000095	DIODE(SI)	
D3	B0EDER000009	DIODE(SI)	
D4	MA1Z300	DIODE(SI)	S
D6	MA8220	DIODE(SI)	S
D13	MA111	DIODE(SI)	S
D16	MA111	DIODE(SI)	S
D17	PQVDBR1111C	DIODE(SI)	S
DA1	B0DDCM000001	DIODE(SI)	
		(COILS)	
L3	PQLQR2M33NKT	COIL	S
L6	PQLQXF330K	COIL	S
L7	PQLQXF330K	COIL	S
L8	MQLRER10JFA	COIL	
L9	PQLQR2KA20T	COIL	S
L10	MQLRER10JFA	COIL	
C133	PQLQR2M8N2KT	COIL	S
C139	PQLQR2M5N6K	COIL	S
		(JACK)	
CN1	PQJJ2H003Z	JACK	S
		(RESISTORS)	
R3	ERJ1WYJ220	22	
R5	ERJ1WYJ220	22	
R8	ERJ2RKF1200	120	
R9	ERJ2RKF2000	200	
R16	ERJ3GEYJ105	1M	
R17	ERJ3GEYJ105	1M	
R22	D0GA104JA015	100K	
R23	ERJ3GEYJ104	100K	
R24	ERJ3GEYJ101	100	
R25	PQ4R10XJ272	2.7K	S
R26	ERJ3GEYJ103	10K	
R27	D0GA104JA015	100K	
R28	ERJ3GEYJ222	2.2K	
R32	ERJ3GEYJ101	100	
R37	PQ4R10XJ180	18	S
R38	D0GA104JA015	100K	
R39	ERJ3GEYJ180	18	

Ref. No.	Part No.	Part Name & Description	Remarks
R40	ERJ3GEYJ335	3.3M	
R42	ERJ3GEYJ273	27K	
R43	D0GA822JA015	8.2K	
R44	ERJ3GEYJ182	1.8K	
R45	ERJ12YJ120	12	
R46	ERJ12YJ270	27	
R47	ERJ3GEYJ104	100K	
R48	ERJ3GEYJ473	47K	
R49	ERJ3GEYJ560	56	
R52	D0GA391JA015	390	
R54	D0GA182JA015	1.8K	
R55	D0GA102JA015	1K	
R56	D0GA222JA015	2.2K	
R57	ERJ3GEYJ222	2.2K	
R64	ERJ3GEYJ102	1K	
R69	ERJ3GEYJ104	100K	
R70	ERJ3GEYJ104	100K	
R71	ERJ3GEYJ104	100K	
R72	ERJ3GEYJ474	470K	
R84	ERJ3GEYJ101	100	
R85	D0GA332JA015	3.3K	
R86	D0GA102JA015	1K	
R87	D0GA103JA015	10K	
R88	D0GA103JA015	10K	
R105	D0GA103JA015	10K	
R106	ERJ3GEYJ184	180K	
R107	ERJ3GEYJ184	180K	
R115	ERJ3GEYJ222	2.2K	
R116	PQ4R10XJ471	470	S
R117	D0GA102JA015	1K	
R118	ERJ3GEYJ271	270	
R119	ERJ3GEYJ271	270	
R123	D0GAR00Z0001	0	
R124	D0GAR00Z0001	0	
R125	D0GAR00Z0001	0	
R127	D0GA101JA015	100	
R129	ERJ3GEYJ681	680	
R130	ERJ3GEYJ103	10K	
R132	ERJ3GEYJ103	10K	
R133	ERJ3GEYJ331	330	
R134	ERJ3GEYJ102	1K	
R135	D0GA103JA015	10K	
R136	D0GA103JA015	10K	
R137	D0GA103JA015	10K	
R138	ERJ8GEYJ270	27	
R139	D0GA471JA015	470	
R140	D0GA102JA015	1K	
R141	D0GA153JA015	15K	
R142	D0GA122JA015	1.2K	
R143	ERJ3GEYJ181	180	
C167	PQ4R10XJ180	18	S
J13	ERJ12Y0R00	0	
J14	ERJ12Y0R00	0	
L4	ERJ3GEY0R00	0	
		(CAPACITORS)	
C1	ECUV1H100DCV	10P	
C2	ECEA1CK101	100	S
C3	ECEA0JU331	330	S
C4	ECEA1CKS100	10	
C5	ECEA1CKS100	10	
C6	ECUV1H100DCV	10P	
C7	ECUV1A105KBV	1	
C8	ECUV1H100DCV	10P	
C11	ECUV1A105KBV	1	
C12	F1B2H152A048	0.0015	
C13	F1B2H152A048	0.0015	
C14	ECKD2H681KB	680P	S
C15	ECKD2H681KB	680P	S
C17	F1G1H221A571	220P	
C21	ECJ0EC1H100D	10P	
C22	F1G1H221A571	220P	
C24	ECUV1C104KBV	0.1	
C25	ECJ0EC1H100D	10P	

Ref. No.	Part No.	Part Name & Description	Remarks
C26	ECJ0EC1H220J	22P	
C27	ECJ0EC1H100D	10P	
C28	ECUV1A224KBV	0.22	
C29	ECUV1H100DCV	10P	
C30	ECUV1C104KBV	0.1	
C32	ECUE1A223KBQ	0.022	
C34	F1G1A1040006	0.1	
C36	ECUV1H100DCV	10P	
C37	F1G1A1040006	0.1	
C38	F1G1A1040006	0.1	
C39	ECUV1A105KBV	1	
C40	PQCUV1A225KB	2.2	
C41	ECUV1C563KBV	0.056	
C42	ECUV1H060DCV	6P	
C43	ECJ0EC1H270J	27P	
C44	F1G1A1040006	0.1	
C45	F1G1A1040006	0.1	
C46	PQCUV1A105KB	1	
C47	ECUV1C563KBV	0.056	
C48	F1G1A1040006	0.1	
C49	ECEA1HKS100	10	S
C50	PQCUV1H104ZF	0.1	S
C53	F1G1A1040006	0.1	
C65	F1G1A1040006	0.1	
C75	ECUV1H100DCV	10P	
C76	ECUV1H103KBV	0.01	
C101	ECUV1H102KBV	0.001	
C102	ECUV1H102KBV	0.001	
C107	ECUV1H102KBV	0.001	
C108	PQCUV1A225KB	2.2	
C109	ECUV1A105KBV	1	
C114	ECJ0EC1H020C	2P	
C119	PQCUV1A225KB	2.2	
C122	ECUV1H101JCV	100P	
C123	ECJ0EC1H101J	100P	
C130	ECJ0EC1H100D	10P	
C135	PQCUV1C105KB	1	
C136	ECJ0EB1H102K	0.001	
C140	ECUV1H100DCV	10P	
C141	ECUV1H030CCV	3P	
C142	ECUV1H100DCV	10P	
C143	ECUV1H100DCV	10P	
C144	ECUV1H100DCV	10P	
C145	ECUV1H100DCV	10P	
C146	ECUV1C104KBV	0.1	
C149	ECUV1H100DCV	10P	
C151	ECUV1A475KB	4.7	
C153	ECJ0EC1H220J	22P	
C154	ECJ0EC1H100D	10P	
C155	ECJ0EC1H020C	2P	
C156	ECJ0EC1H100D	10P	
C157	ECJ0EC1H070D	7P	
C158	ECJ0EC1H100D	10P	
C159	ECJ0EC1H020C	2P	
C160	ECJ0EC1H100D	10P	
C161	ECJ0EC1H020C	2P	
C162	ECJ0EC1H100D	10P	
C163	ECJ0EC1H100D	10P	
C164	F1G1H151A541	150P	
C169	ECUV1C104KBV	0.1	
C171	ECUV1H102KBV	0.001	
C172	ECJ0EC1H101J	100P	
C173	ECJ0EC1H100D	10P	
C174	F1G1A1040006	0.1	
C180	ECUV1H100DCV	10P	
C181	ECUV1H100DCV	10P	
C182	ECUV1H100DCV	10P	
C183	ECUV1H070CCV	7P	
C184	ECUV1H100DCV	10P	
C191	ECUV1H100DCV	10P	
C192	ECUV1H100DCV	10P	
C193	ECJ0EC1H100D	10P	
C194	ECUV1H100DCV	10P	

Ref. No.	Part No.	Part Name & Description	Remarks
C195	ECUV1H100DCV	10P	
C196	ECUV1H100DCV	10P	
C197	ECUV1H100DCV	10P	
C198	ECUV1H100DCV	10P	
C199	ECUV1H100DCV	10P	
C201	ECJ0EC1H100D	10P	
C203	ECJ0EC1H100D	10P	
C206	ECUV1H100DCV	10P	
C207	ECJ0EC1H100D	10P	
C208	ECUV1H100DCV	10P	
C213	ECUV1H100DCV	10P	
C214	ECJ0EC1H100D	10P	
C215	F1G1E472A086	0.0047	
		(OTHERS)	
E1	PQMC10497Z	MAGNETIC SHIELD	
IC2	PQLP10263Z	RF UNIT	
CN14	L0DACA000024	BUZZER	
SA1	J0LF00000026	VARISTOR (SURGE ABSORBER)	
SW1	EVQQJJ05Q	SPECIAL SWITCH	
X1	H0D103500003	CRYSTAL OSCILLATOR	

36.2. Handset

36.2.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
101	PQGP10272Z3	PANEL, LCD	AS-HB
102	PQHS10673W	TAPE, DOUBLE SIDED	
103	PQKM10647W0	CABINET BODY (for KX-TCA122EXT)	ABS-HB
103	PQKM10647Y3	CABINET BODY (for KX-TCA121EXT)	ABS-HB
104	PQGT17386X	NAME PLATE (for KX-TCA122EXT)	
104	PQGT17384X	NAME PLATE (for KX-TCA121EXT)	
105	PQHS10705Z	SPACER, LCD CUSHION	
106	PQBC10413Z1	BUTTON, NAVI KEY	ABS-HB
107	PQBC10414Y1	BUTTON, SP PHONE	ABS-HB
108	PQSX10274X	KEYBOARD SWITCH	
109	PQHS10467Z	COVER, SP NET	
110	L0AD02A00015	SPEAKER	
111	PQHR11104Z	GUIDE, SPEAKER	ABS-HB
112	PQWE10034Z	BATTERY TERMINAL	
113	PQJT10216Z	CHARGE TERMINAL (R)	
114	PQJT10217Z	CHARGE TERMINAL (L)	
115	PQHR11059Z	GUIDE, SPEAKER	ABS-HB
116	PQHG10702Z	RUBBER PARTS, SPEAKER	
117	L0AD02A00010	SPEAKER	
118	PQHS10622Z	COVER, SP NET	
119	PQJC10056Y	BATTERY TERMINAL	
120	PQKF10630X3	CABINET COVER	ABS-HB
121	PQHX11290Y	PLASTIC PARTS, BATTERY COVER SHEET	
122	PQHS10561Y	SPACER, BATTERY COVER	
123	PQKK10583Z3	LID, BATTERY COVER	ABS-HB

36.2.2. Main P.C.Board Parts

Note:

(*1) When replacing IC1 or IC3, data need to be written to it with PQZZTCD220SL. Refer to **Handset** (P.67) of **THINGS TO DO AFTER REPLACING IC** .

(*2) When replacing the Handset LCD, See **HOW TO REPLACE THE HANDSET LCD** (P.43).

Ref. No.	Part No.	Part Name & Description
PCB100	PQWPCD220SLR	MAIN P.C.BOARD ASS´Y (RTL) (for KX-TCD220SLT)
PCB100	PQWPCA122EXR	MAIN P.C.BOARD ASS´Y (RTL) (for KX-TCA121EXT)
		(ICs)
IC1	C1CB00001994	IC (BBIC) (*1)
IC3	PQWI2A130EXR	IC (EEPROM) (*1)
		(TRANSISTORS)
Q1	PQVTFDN335N	TRANSISTOR(SI)
Q2	B1ADGE000004	TRANSISTOR(SI)
Q3	B1ADGE000004	TRANSISTOR(SI)
Q4	B1ADGE000004	TRANSISTOR(SI)
Q5	B1ABCF000103	TRANSISTOR(SI)
Q7	PSVTDTC143X	TRANSISTOR(SI)
Q8	PSVTDTC143X	TRANSISTOR(SI)
Q9	UN9219J	TRANSISTOR(SI)
Q10	B1ABCF000103	TRANSISTOR(SI)
Q11	B1ABCF000103	TRANSISTOR(SI)
		(DIODES)
D1	B0JCME000035	DIODE(SI)
D4	MA8047	DIODE(SI)
D5	MA8047	DIODE(SI)
D6	B0BC2R1A0006	DIODE(SI)
D7	MA2Z72000	DIODE(SI)
LED1	LNJ308G8JRA	LED
LED2	LNJ308G8JRA	LED
LED3	LNJ308G8JRA	LED
LED4	LNJ308G8JRA	LED
LED5	LNJ308G8JRA	LED
LED6	LNJ308G8JRA	LED
LED7	LNJ308G8JRA	LED
LED9	PQVDBR1111C	LED
		(COILS)
F1	PQLQR2M5N6K	COIL
L1	G1C470M00025	COIL
L4	G1C100MA0072	COIL
L5	G1C100MA0072	COIL
L9	PQLQR2M33NKT	COIL
		(RESISTORS)
R1	ERJ6RSJR10V	0.1
R5	ERJ3GEYJ471	470
R6	D0GA103JA015	10K
R7	D0GA224JA015	220K
R12	ERJ3GEYJ393	39K
R15	ERJ3GEYJ100	10
R19	ERJ3GEYJ565	5.6M
R20	D0GA102JA015	1K
R21	D0GA102JA015	1K
R25	D0GA331JA015	330
R26	D0GA331JA015	330
R29	ERJ3GEYJ222	2.2K
R37	ERJ3GEY0R00	0
R38	ERJ3GEY0R00	0
R39	D0GA103JA015	10K
R40	D0GA103JA015	10K
R43	ERJ6RSJR10V	0.1
R46	ERJ3GEYJ562	5.6K
R47	ERJ3GEYJ562	5.6K
R54	D0GAR00Z0001	0
R57	ERJ3GEYJ680	68
R59	D0GAR00Z0001	0
R60	D0GA101JA015	100
R61	D0GA102JA015	1K
R63	D0GA103JA015	10K
R64	D0GA103JA015	10K
R68	D0GA682JA015	6.8K
R69	ERJ3EKF8203	820K
R70	ERJ3EKF4303	430K
R71	ERJ3GEYJ221	220
R72	D0GA102JA015	1K
R73	ERJ3GEYJ104	100K
R75	D0GA102JA015	1K
R81	D0GA4R7JA014	4.7
R82	ERJ3GEYJ101	100
R83	ERJ6GEY0R00	0
R85	D0GA330JA015	33
R86	ERJ3GEYJ330	33
R87	D0GA181JA015	180
R88	D0GA181JA015	180
R89	D0GA181JA015	180

Ref. No.	Part No.	Part Name & Description
R90	ERJ3GEYJ684	680K
R91	D0GA104JA015	100K
R92	ERJ3GEY0R00	0
R95	ERJ3GEY0R00	0
R96	D0GA103JA015	10K
L6	ERJ6GEY0R00	0
L7	ERJ6GEY0R00	0
L8	ERJ3GEY0R00	0
		(CAPACITORS)
C1	EEE0GA331WP	330
C3	ECUV1C104KBV	0.1
C4	ECUV1H100DCV	10P
C5	ECST0JY106	10
C6	ECUV1H080DCV	8P
C7	ECUV1H150JCV	15P
C8	ECUV1A224KBV	0.22
C10	ECUV1C104KBV	0.1
C12	ECUV1A105KBV	1
C17	ECUV1H100DCV	10P
C18	ECJ0EB1H102K	0.001
C19	F1G1A1040006	0.1
C20	F1G1A1040006	0.1
C21	F1G1A1040006	0.1
C22	F1G1A1040006	0.1
C23	F1G1A1040006	0.1
C24	F1G1A1040006	0.1
C27	ECUV1A105KBV	1
C28	ECUV1A105KBV	1
C30	ECUV1A105KBV	1
C31	ECUV1A105KBV	1
C32	ECUV1A105KBV	1
C33	ECUV1A105KBV	1
C34	ECUV1A105KBV	1
C35	ECUV1A105KBV	1
C37	F1G1A1040006	0.1
C39	ECUV1A105KBV	1
C40	ECST0JY106	10
C44	ECJ0EC1H100D	10P
C45	ECJ0EB1H102K	0.001
C46	ECJ0EC1H100D	10P
C47	ECJ0EC1H020C	2P
C48	ECJ0EC1H100D	10P
C49	ECJ0EC1H020C	2P
C50	ECJ0EC1H100D	10P
C51	ECJ0EC1H100D	10P
C52	ECUV1C104KBV	0.1
C53	ECJ0EC1H151J	150P
C54	ECJ0EC1H100D	10P
C55	ECJ0EC1H020C	2P
C57	EEE0JA331P	330
C58	ECUV1C104KBV	0.1
C60	ECUV1A475KB	4.7
C62	ECJ0EC1H220J	22P
C63	ECUV1A475KB	4.7
C66	ECUV1H020CCV	2P
C68	F1G1A1040006	0.1
C69	ECUV1H100DCV	10P
C70	ECUV1H100DCV	10P
C71	ECJ0EC1H100D	10P
C72	F1G1A1040006	0.1
C78	PQCUV1H100DC	10P
C79	PQCUV1H100DC	10P
C84	ECJ0EB1H102K	0.001
C87	ECUV1H100DCV	10P
C91	ECJ0EC1H100D	10P
C93	ECUV1H101JCV	100P
C94	ECUV1H101JCV	100P
C95	PQCUV1H100DC	10P
C97	ECUV1H100DCV	10P
C98	ECUV1A475KB	4.7
C100	ECJ0EC1H100D	10P
C103	ECUV1H100DCV	10P
C104	ECUV1A105KBV	1
C107	ECUV1H101JCV	100P
C108	ECJ0EC1H100D	10P
C109	ECJ0EC1H100D	10P
C111	ECJ0EC1H101J	100P
C112	ECJ0EC1H101J	100P
C113	ECUV1H101JCV	100P
C114	ECJ0EC1H100D	10P
C115	ECJ0EC1H100D	10P
C116	ECJ0EC1H100D	10P
C117	ECJ0EC1H100D	10P
C118	ECUV1H103KBV	0.01
C119	F1G1A1040006	0.1
C120	F1G1A1040006	0.1
C121	ECUV1H102KBV	0.001
C122	ECUV1A105KBV	1
C123	ECUV1H100DCV	10P
		(OTHERS)
MIC	L0CBAB000052	MICROPHONE
E101	PQHR11088Y	GUIDE, LCD
E102	PQHR11092Z	TRANSPARENT PLATE, LCD PLATE
E103	PQHX11289Z	COVER, LCD COVER SHEET
E104	L5DCADC00013	LIQUID CRYSTAL DISPLAY (*2)
E105	PQWEA144EXR	HEAT SHIELD PARTS
E106	PQSA10159Z	ANTENNA
CN6	PQLP10263Z	RF UNIT
X1	H0D103500007	CRYSTAL OSCILLATOR

36.3. Charger Unit

36.3.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
200	PQLV30032ZT	CHARGER UNIT	
200-1	PQGG10276Z3	GRILLE	PC-HB
200-2	PQKM10656Z3	CABINET BODY	ABS-HB
200-3	PQHR11085Z	CASE, CHARGE TERMINAL	
200-4	PQKE10384Z1	HOLDER, CHARGE TERMINAL (R)	POM-HB
200-5	PQKE10385Z1	HOLDER, CHARGE TERMINAL (L)	POM-HB
200-6	PQJT10218Y	CHARGE TERMINAL (R)	
200-7	PQJT10219Y	CHARGE TERMINAL (L)	
200-8	PQKF10653Z3	CABINET COVER	PS-HB
200-9	PQGT17399X	NAME PLATE	
200-10	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	

36.3.2. Main P.C.Board Parts

Ref. No.	Part No.	Part Name & Description	Remarks
PCB200	PQWPA130ETCH	MAIN P.C.BOARD ASS´Y (RTL)	
		(DIODE)	
D11	B0JCME000035	DIODE(SI)	
		(JACK)	
J1	PQJJ1B4Y	JACK	S
		(RESISTORS)	
R11	ERJ1WYJ220	22	
R12	ERJ1WYJ220	22	

36.4. Accessories and Packing Materials

36.4.1. KX-TCD220SLT

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLV19CEX	AC ADAPTOR	⚠
A2	PFJA02B001Z	CORD, TELEPHONE	
A3	PQQX14540Z	INSTRUCTION BOOK (for French)	
A4	PQQX14541Z	INSTRUCTION BOOK (for Italian)	
A5	PQQX14542Z	INSTRUCTION BOOK (for German)	
A6	PQQW13695Z	QUICK GUIDE (for French)	
A7	PQQW13696Z	QUICK GUIDE (for Italian)	
A8	PQQW13697Z	QUICK GUIDE (for German)	

Ref. No.	Part No.	Part Name & Description	Remarks
A9	PQQW12846W	LEAFLET, RECHARGE	
P1	PQPP10116Z	PROTECTION COVER (for Base Unit)	
P2	PQPP10084Z	PROTECTION COVER (for Handset)	
P3	PQPK14581Z	GIFT BOX	

36.4.2. KX-TCA121EXT

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLV200CEX	AC ADAPTOR	⚠
A2	PQQX14495Z	INSTRUCTION BOOK	
A3	PQQW12846W	LEAFLET, RECHARGE	
P1	PQPP10086Z	PROTECTION COVER (for Charger Unit)	
P2	PQPP10084Z	PROTECTION COVER (for Handset)	
P3	PQPK14604Z	GIFT BOX	

36.5. Fixtures and Tools

Note:

(*1) See **The Setting Method of JIG (Base Unit)** (P.57), and **The Setting Method of JIG (Handset)** (P.65).

(*2) When replacing the Handset LCD, See **HOW TO REPLACE THE HANDSET LCD** (P.43).

Part No.	Part Name & Description	Remarks
PQZZ1CD300E	JIG CABLE (*1)	
PQZZTCD220SL	BATCH FILE (*1)	
PQZZ430PIR	TIP OF SOLDERING IRON (*2)	
PQZZ430PRB	RUBBER OF SOLDERING IRON (*2)	

37 FOR SCHEMATIC DIAGRAM

37.1. Base Unit (SCHEMATIC DIAGRAM (BASE 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.

37.2. Handset (SCHEMATIC DIAGRAM (HANDSET))

Notes:

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

37.3. Charger Unit (SCHEMATIC DIAGRAM (CHARGER UNIT))

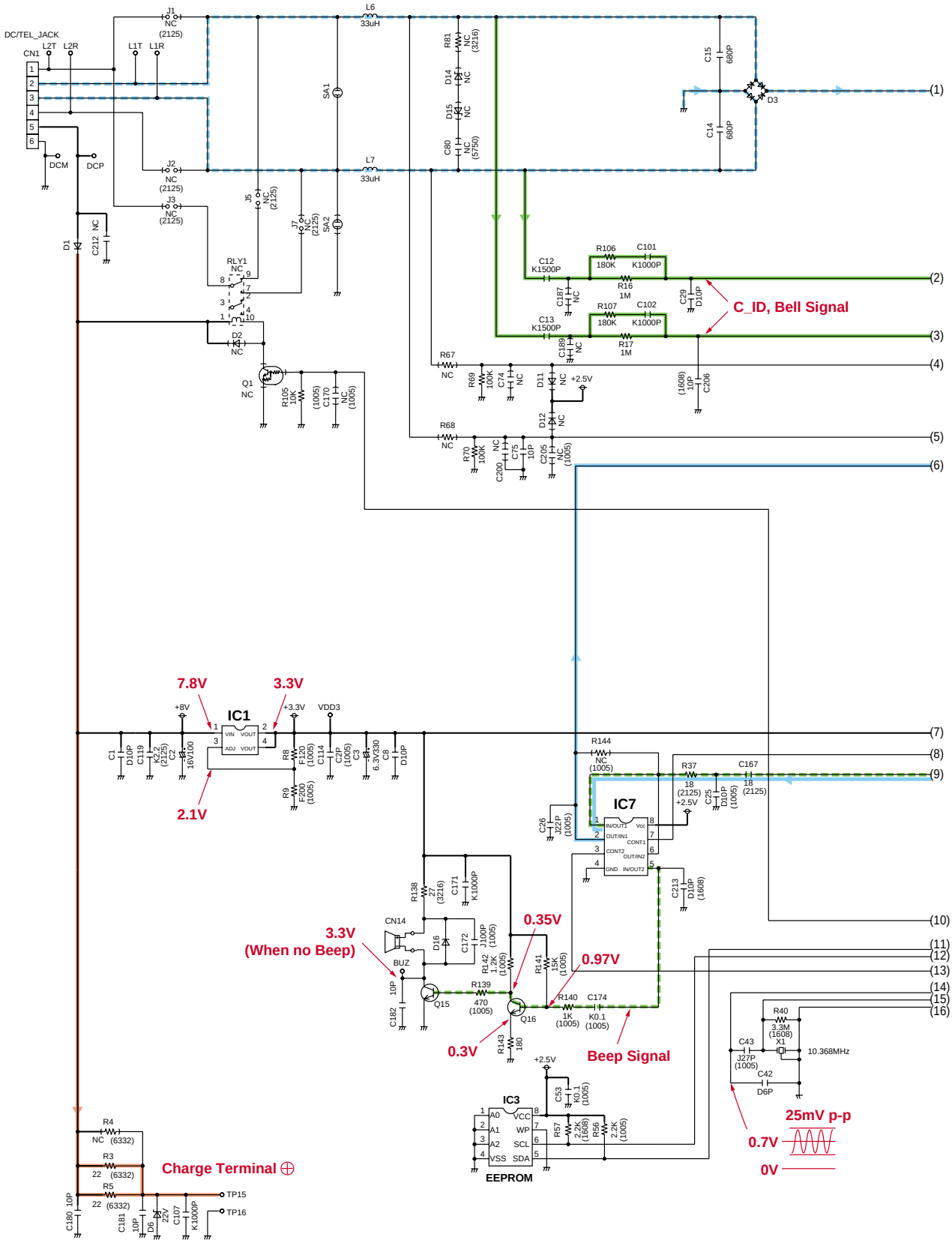
Notes:

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

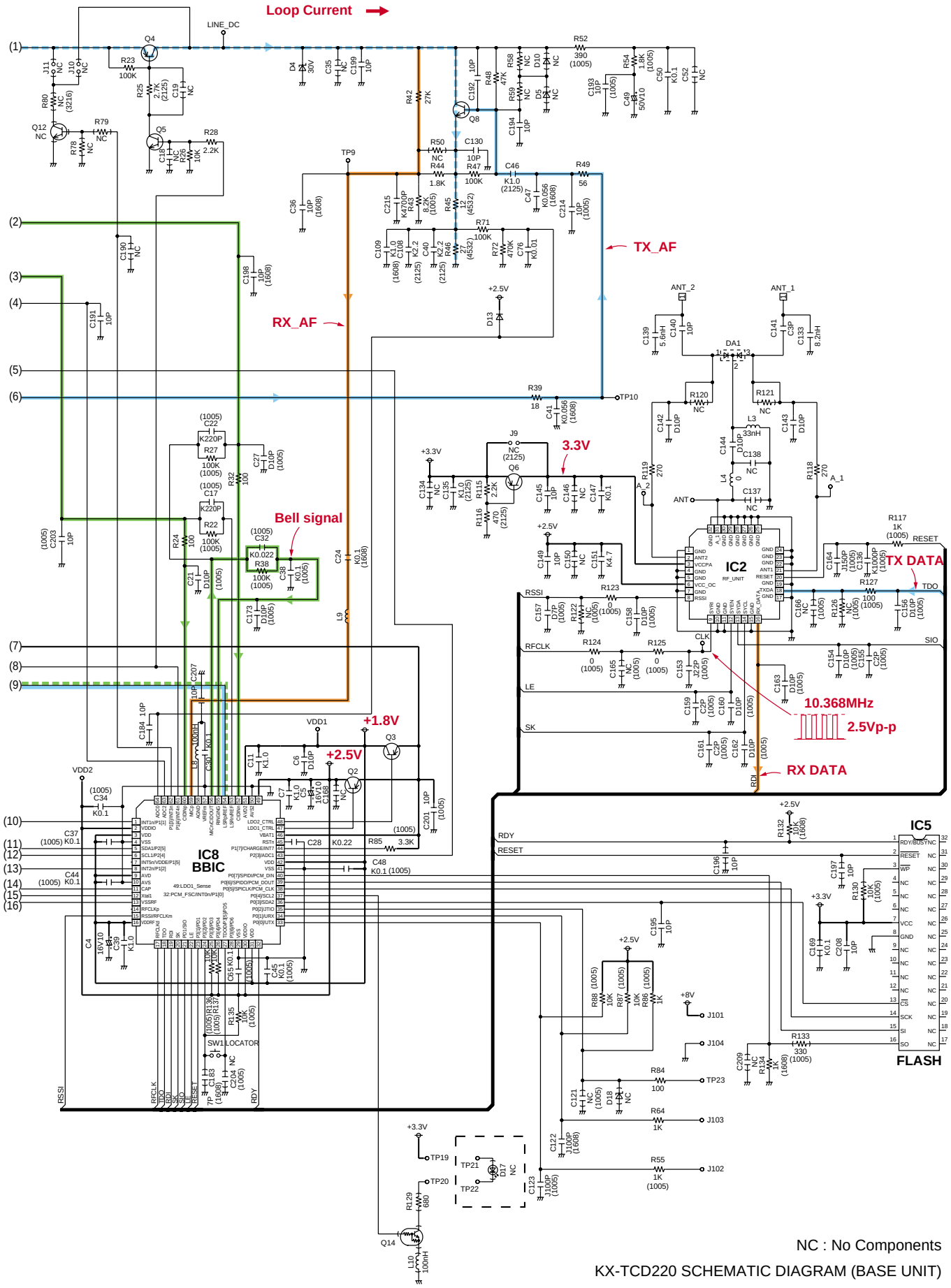
> Important Safety Notice:
> Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

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

38 SCHEMATIC DIAGRAM (BASE UNIT)



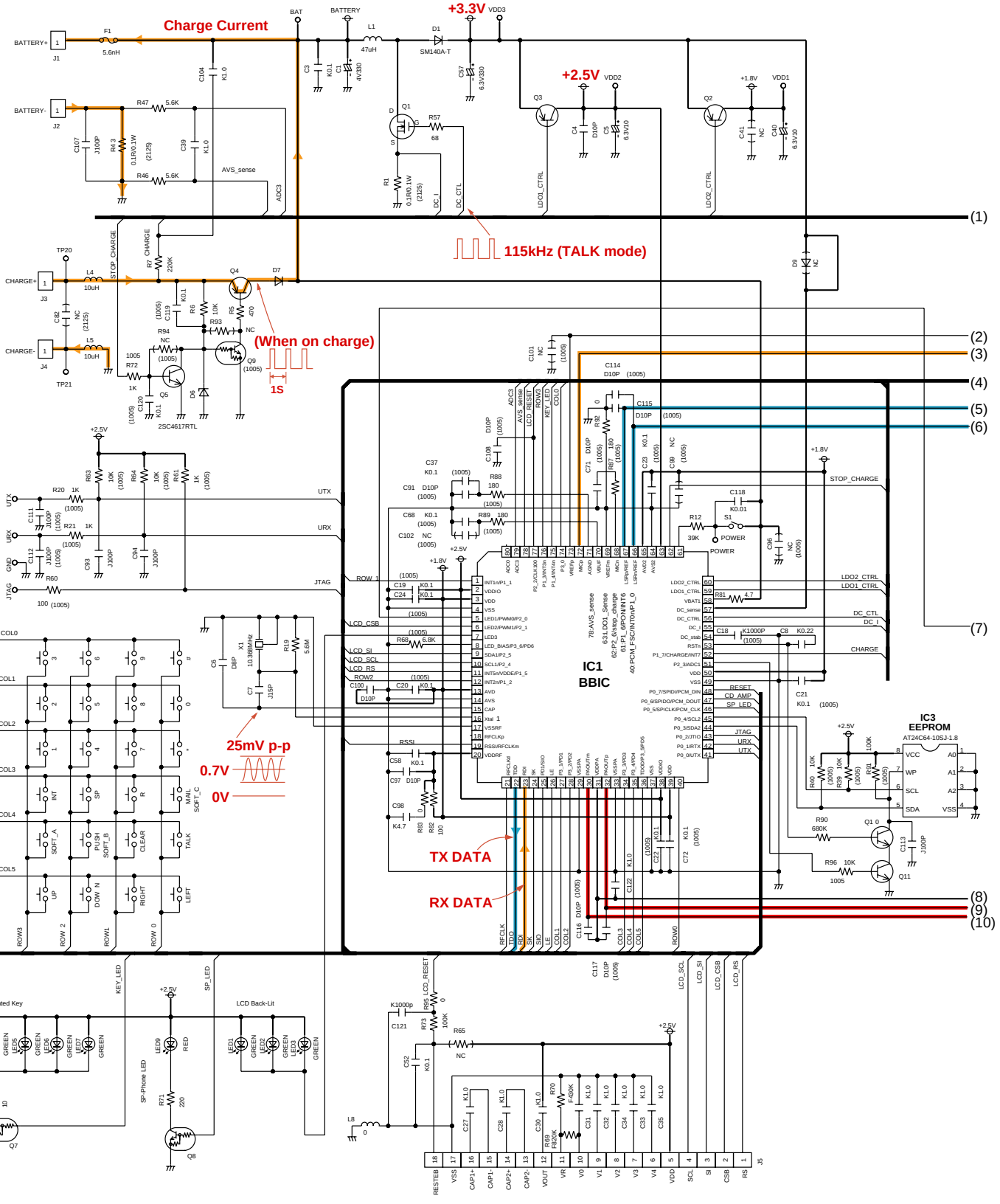
NC : No Components



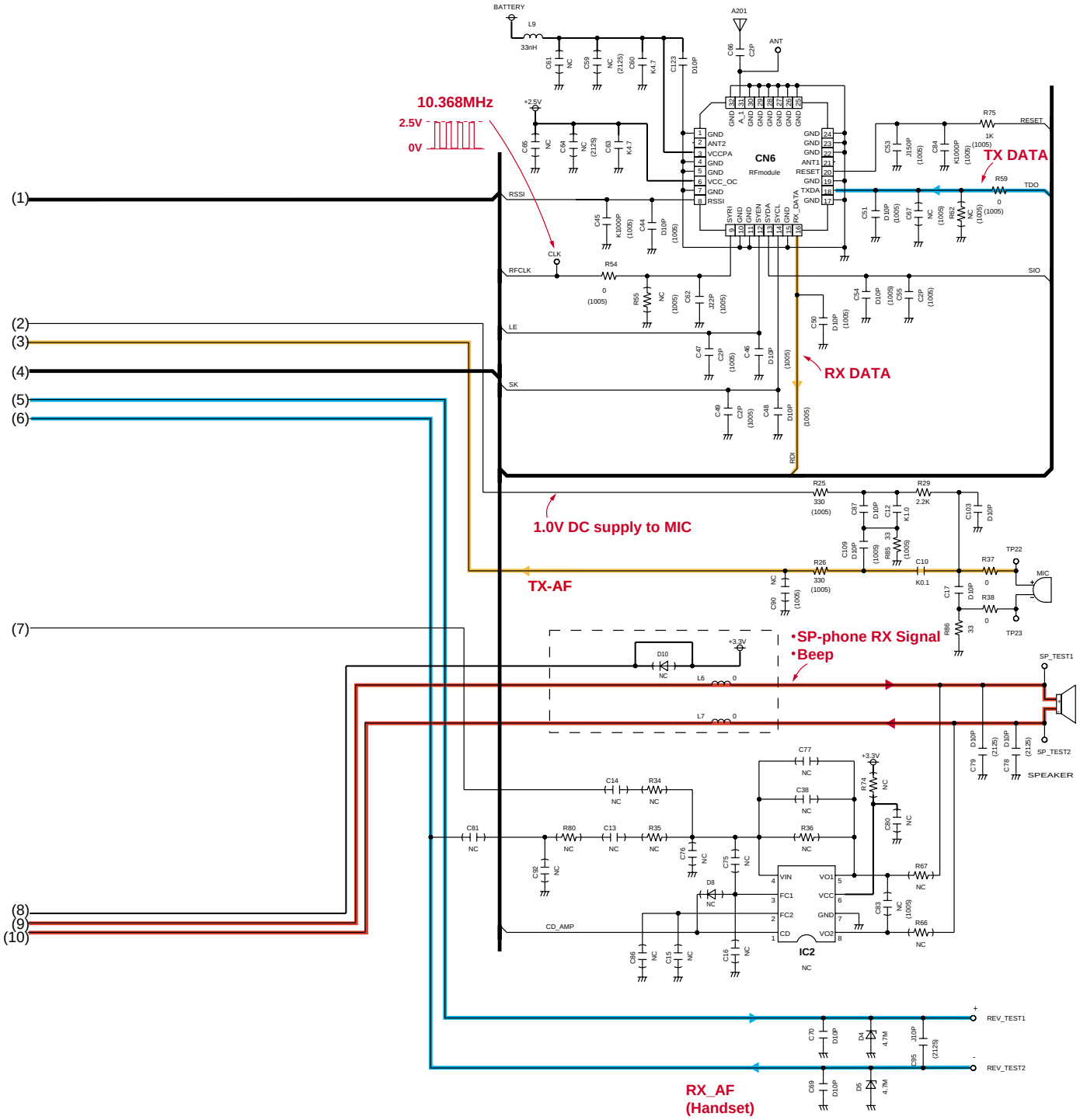
NC : No Components

KX-TCD220 SCHEMATIC DIAGRAM (BASE UNIT)

39 SCHEMATIC DIAGRAM (HANDSET)



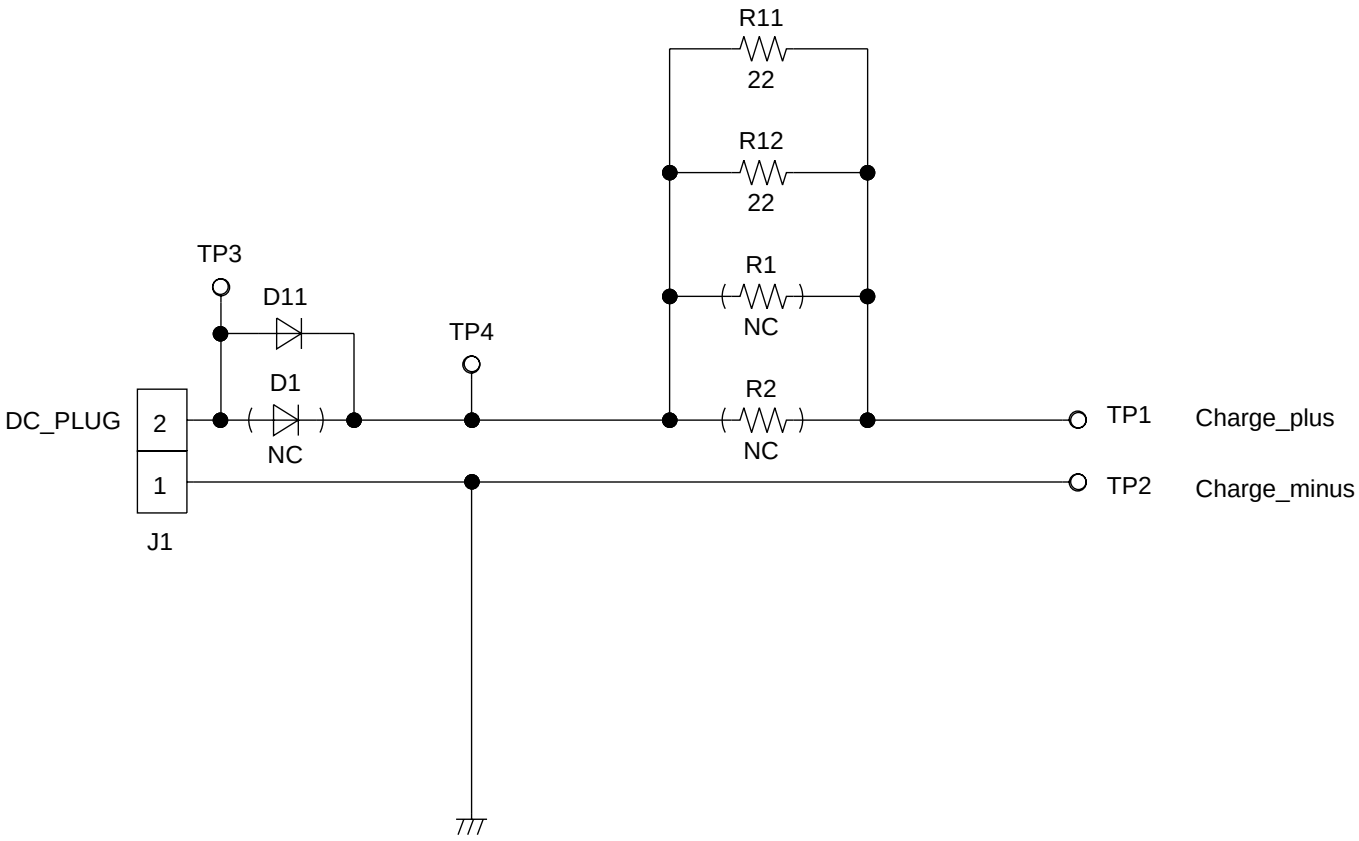
NC : No Components



NC : No Components

KX-TCA122/121 SCHEMATIC DIAGRAM (HANDSET)

40 SCHEMATIC DIAGRAM (CHARGER UNIT)

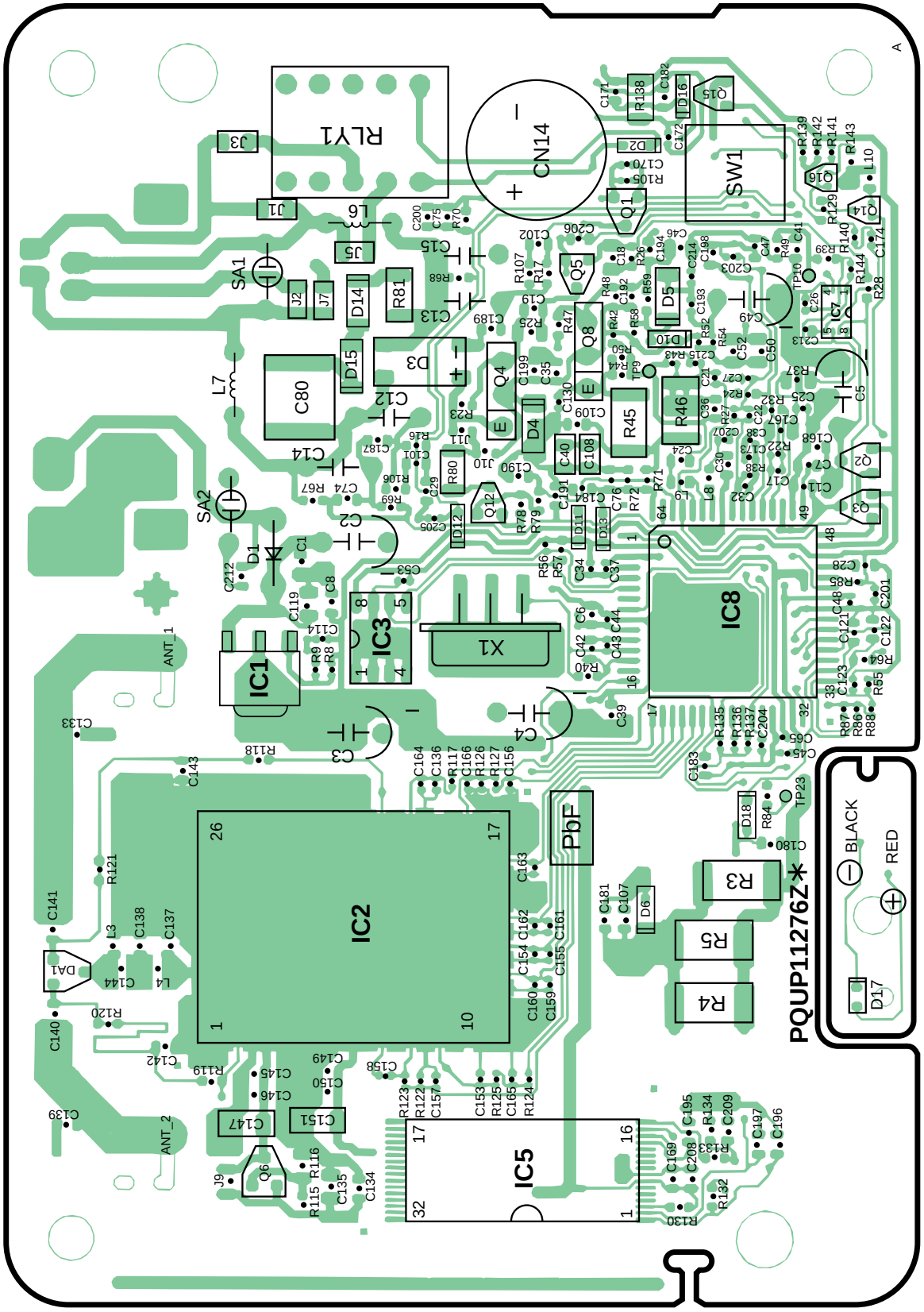


NC : No Components

SCHEMATIC DIAGRAM (CHARGER UNIT)

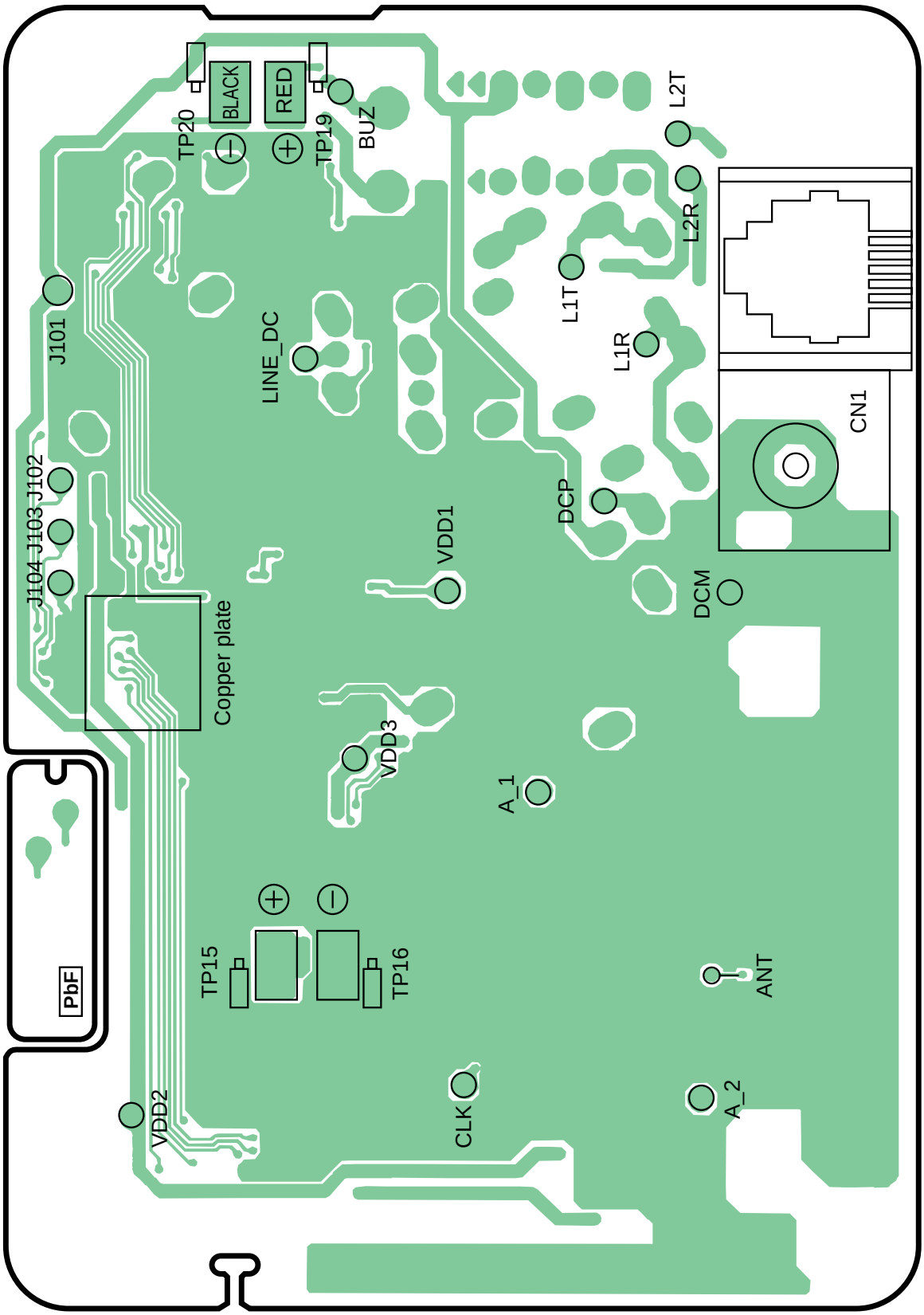
41 CIRCUIT BOARD (BASE UNIT)

41.1. Component View



KX-TCD220 CIRCUIT BOARD (Base Unit_Main (Component View))

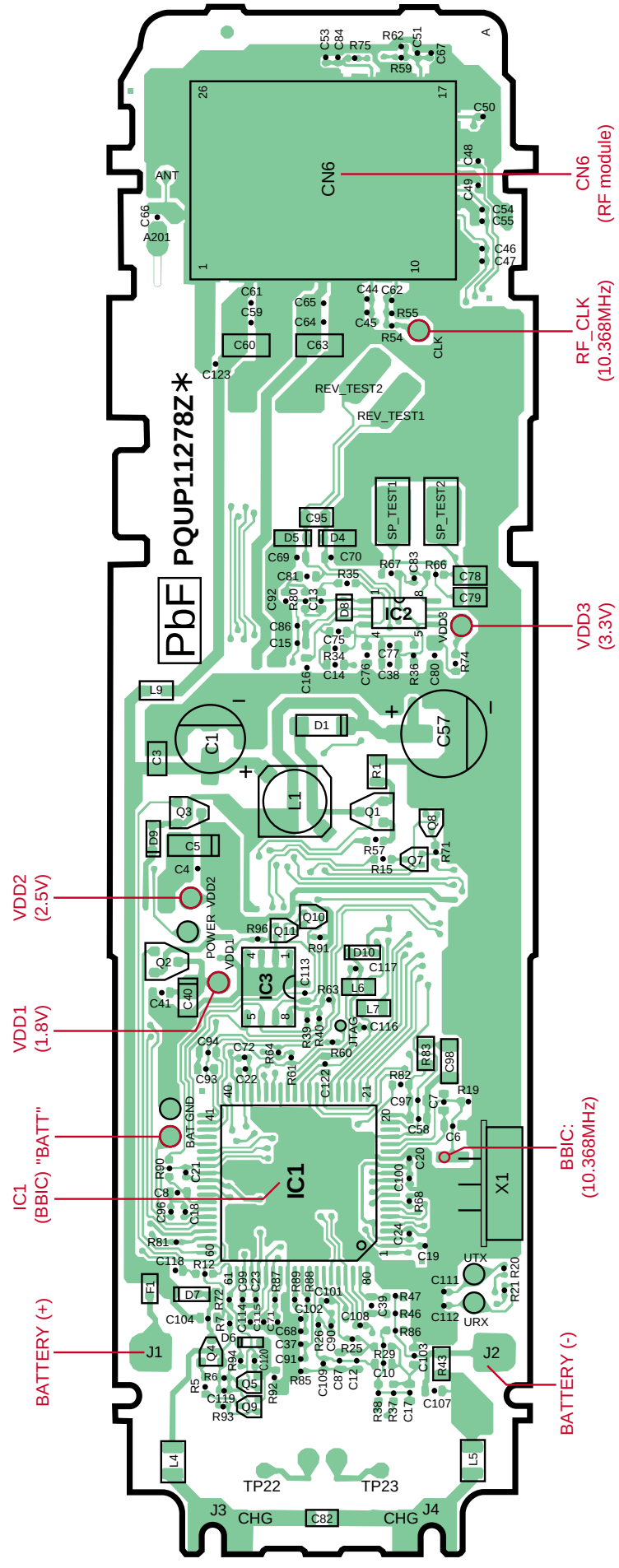
41.2. Flow Solder Side View



KX-TCD220 CIRCUIT BOARD (BASE UNIT) Flow Solder Side View

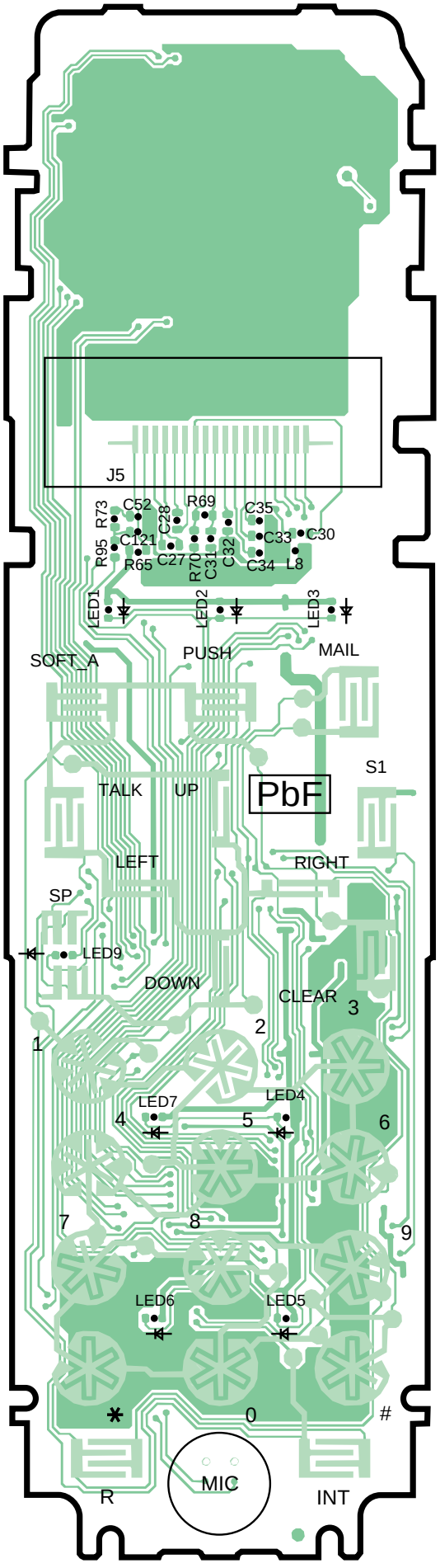
42 CIRCUIT BOARD (HANDSET)

42.1. Component View



KX-TCA122/121 CIRCUIT BOARD (HANDSET) Component View

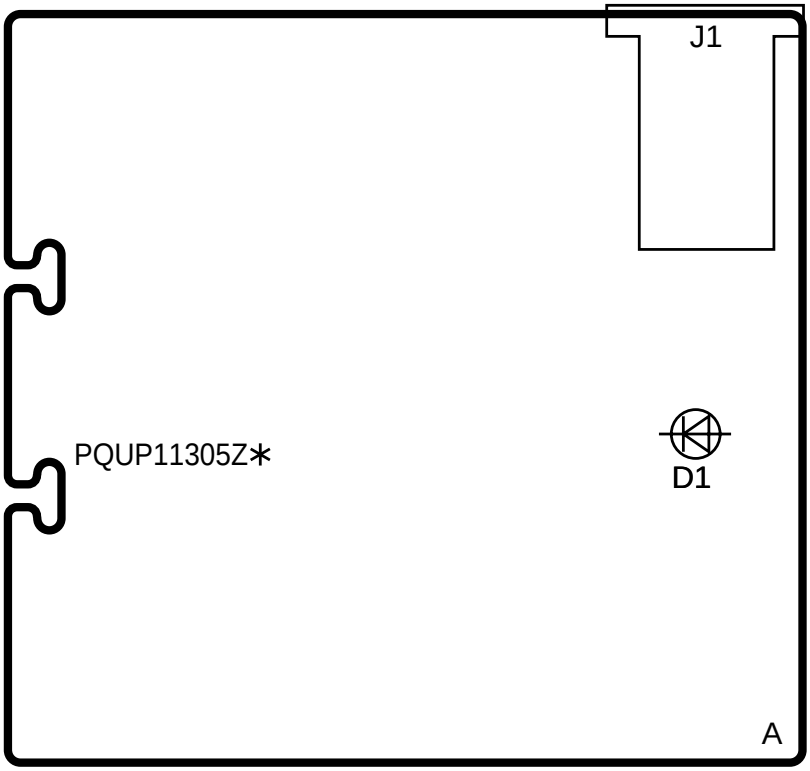
42.2. Flow Solder Side View



KX-TCA122/121 CIRCUIT BOARD (HANDSET) Flow Solder Side View

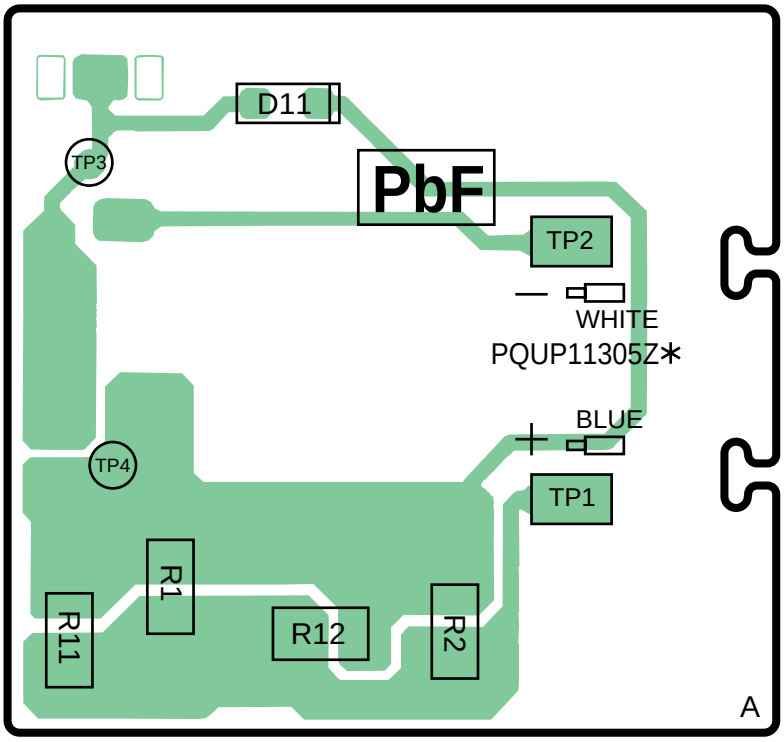
43 CIRCUIT BOARD (CHARGER UNIT)

43.1. Component View



CIRCUIT BOARD (CHARGER UNIT) Component View

43.2. Flow Solder Side View



CIRCUIT BOARD (CHARGER UNIT) Flow Solder Side View