ORDER NO. KM40509869CE

Service Manual

Telephone Equipment

ABH and Caller ID Compatible

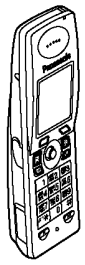
KX-TCD816UAS
KX-TCD816UAT
KX-TCA181UAS
KX-TCA181UAT

Digital Cordless Phone

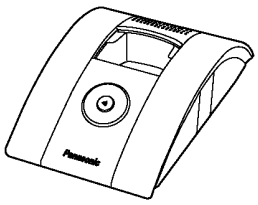
Silver Version

Titanium Black Version

(for Ukraine)



KX-TCA181UAS/UAT
(HANDSET)



KX-TCD816UAS/UAT
(BASE UNIT)

(CHARGER UNIT)

Configuration for each model

Model No	Base Unit	Handset	Charger Unit
KX-TCD816	1	1 (TCA181)	
KX-TCA181*		1 (TCA181)	1

* KX-TCA181 is also an optional accessory, which contains a handset and a charger.

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
Operation range:	Up to 300 m outdoors, Up to 50 m indoors
Analog telephone connection:	Telephone Line

Power source:	AC Adaptor (220 - 240 V AC, 50 Hz)
Power consumption, Base Unit:	Standby: Approx. 1.9 W/Maximum: Approx. 6.4 W
Charger Unit:	Standby: Approx. 2.0 W/Maximum: Approx. 8.0 W
Battery life, Handset (if batteries are fully charged):	Stand-by: Up to 150 hours (Ni-MH) Talk: Up to 14 hours (Ni-MH)
Operating conditions:	5 °C - 40 °C, 20 % - 80 % relative air humidity (dry)
Dimensions, Base Unit (D x W x L):	Approx. 54 mm x 110 mm x 168 mm
Dimensions, Handset (D x W x L):	Approx. 158 mm x 48 mm x 34 mm
Dimensions, Charger Unit (D x W x L):	Approx. 91 mm x 85 mm x 59 mm
Mass (weight), Base Unit:	Approx. 286 g
Mass (weight), Handset:	Approx. 154 g
Mass (weight), Charger Unit:	Approx. 110 g
Optional Headset:	KX-TCA89EX

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

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⚠ WARNING

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

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 is the extract from the Operating Instructions of this model, it is subject to change without notice. You can download and refer to the original Operating Instructions on TSN Server for further information.

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1 ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:

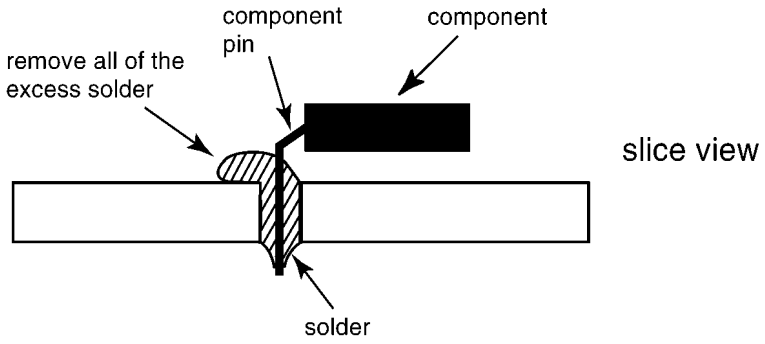
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

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

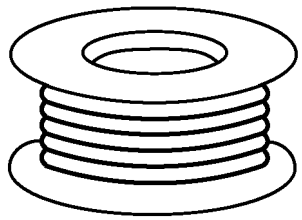
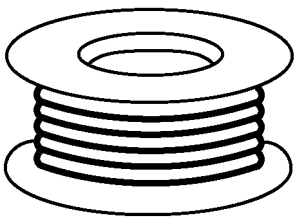
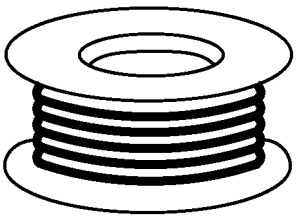
- PbF solder has a melting point that is 50°F ~ 70°F (30°C ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700°F ± 20°F (370°C ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.
- PbF solder will tend 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

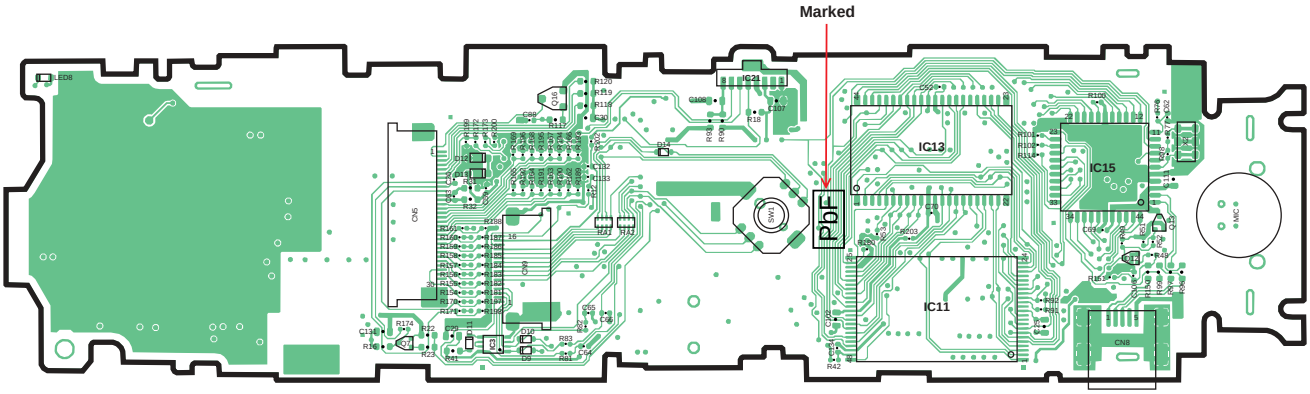
There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper (Sn+Ag+Cu), you can also use Tin and Copper (Sn+Cu) or Tin, Zinc, and Bismuth (Sn+Zn+Bi). Please check the manufacturer's specific instructions for the melting points of their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

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

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

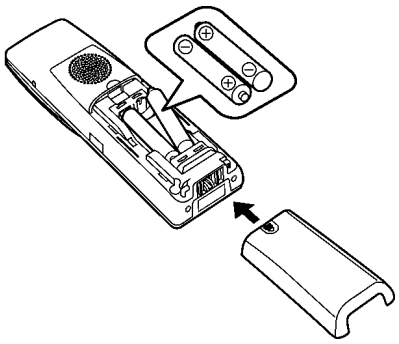
1. Danger of explosion if battery is incorrectly replaced.
2. Replace only with the same or equivalent type recommended by the manufacturer.
3. Dispose of used batteries according to the manufacture’s Instructions.

4 OPERATING INSTRUCTIONS

4.1. Battery

4.1.1. Battery Installation

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



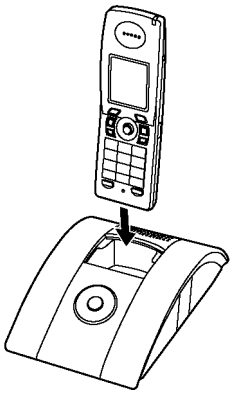
Note:

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

4.1.2. Battery Charge

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

When charging, and battery strength icon are alternately shown on the display. 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.
- If you want to use the unit immediately, charge the batteries for at least 15 minutes.
- 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.

4.1.3. Battery Life

Panasonic Ni-MH batteries (700 mAh)

Operation	Operating Time
While in use (talking)	14 hours max.
While not in use (standby)	150 hours max.

Note:

- Battery operating time may be shortened over time depending on usage conditions and ambient temperature.

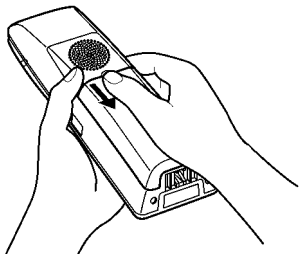
4.1.4. Battery Replacement

Important:

- We recommend the use of Panasonic rechargeable batteries P03P (HHP-4EPT).

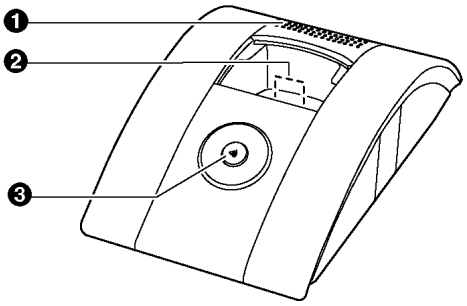
Press the notch on the handset cover firmly and slide it in the direction of the arrow.

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



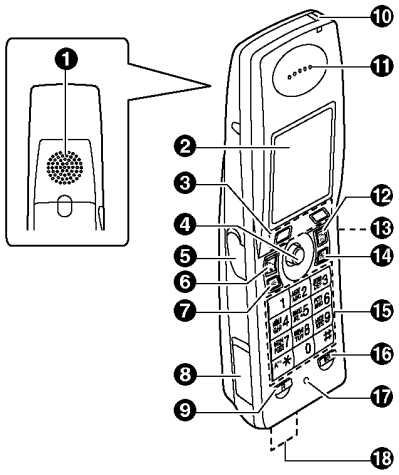
4.2. Location of Controls

4.2.1. Base Unit



❶ Ringer
❷ Charge contacts
❸ 【•))】(Page)

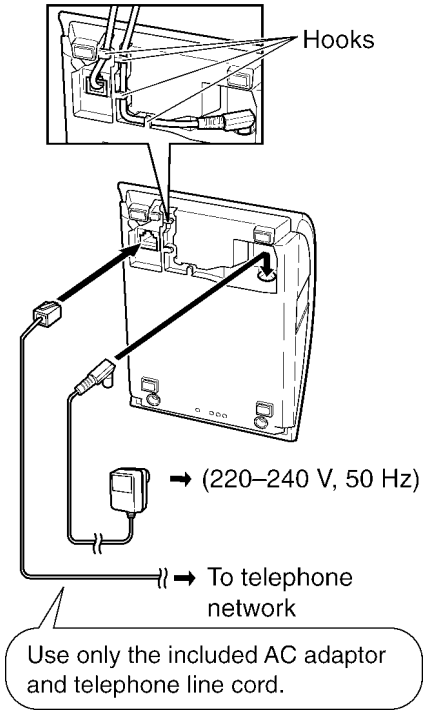
4.2.2. Handset



❶ Speaker
❷ Display
❸ Soft keys
❹ Joystick
❺ Headset jack/Audio jack
❻ 【 】(Talk)
❼ 【 】(Speakerphone)
❽ USB cable jack
❾ 【R】(Recall)
❿ Charge indicator/Ringer indicator
⓫ Receiver
⓬ 【 】(Off/Power)
⓭ Infrared port
⓮ 【C/ 】(Clear/Mute)
⓯ Dial keypad
⓰ 【INT】(Intercom)
⓱ Microphone
⓲ Charge contacts

4.3. Connections

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



Important:

- For information on connecting the handset to a PC, refer to the included “Installation Guide for USB GEAR”.

Note:

- 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.

4.4. 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 highlighted.

4.4.1. Base Unit

- These items are customised using the handset.

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	—	Pulse	Tone/Pulse
	Recall	—	700 msec.	80/90/100/110/160/200/250/300/400/600/700/900 msec
	Pause Length	—	3 sec.	3 sec/5 sec
	Emergency No.	—	03, 01, 02, 04	Up to 5 numbers
	ARS Settings	Carrier Code	Off	On (Up to 5 carrier codes)/Off
		Area Code	—	Up to 25 area codes
	Call Restrict	—	—	Up to 6 numbers
ABH	Mode	—	ABH	ABH/Caller ID
	No. of Digits	—	7 Digits	4 ~ 7 digits
	No. of Signals	—	3	1 ~ 5 times
	Signal Length	—	140	100 ~ 300 ms (divisible by 10)
	Signal Delay	—	200	100 ~ 900 ms (divisible by 50)
	1st Sig. Delay	—	200	100 ~ 900 ms (divisible by 50)
Other Options	Base Unit PIN	—	0000	—
	Repeater Mode	—	Off	On/Off
	Reset Base	—	—	—

Note:

- The items with a mark "**" are not shown on the display.

4.4.2. Handset

Handset settings menu	Sub-menu	Sub-menu 2	Default setting	Remarks (Selectable options)
Media Browser	User Pictures	—	—	—
	User Ringtones	—	—	—
	Memory Status	—	—	—
Time Settings	Set Date & Time	—	—	—
	Memo Alarm	—	Off	Up to 5 memo alarms (Off/Once/Daily)
Ringer Setup	Ringer Volume	—	*Maximum***	Off/1 to 6**
	Ext. Ringtone *(External ringtone)*	Preset Ringtones	Ringtone 1	1 to 20
		User Ringtones	—	—
	Int. Ringtone *(Intercom ringtone)*	Preset Ringtones	Ringtone 1	1 to 20
		User Ringtones	—	—
	Cust. Ringtone *(Customise ringtone)*	Record	—	—
		List	—	—
	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	Wallpaper	No Picture	—	—
		Preset Pictures	Picture 1	1 to 8
		User Pictures	—	—
	Display Colour	—	Colour1	1 to 5
	Standby Display	—	Off	Off/Handset Name/Base Number
	Select Language	—	УКРАЇНСЬКА	6 languages selectable
	Contrast	—	Contrast 4	1 to 6
Baby Monitor	On/Off	—	Off	On/Off *1
	Sensitivity	—	*Middle*	Low/Middle/High level
Call Options	Direct Call	Phone Number	—	—
		On/Off	Off	On/Off
	Calling Code	—	—	24 digits max.
	Auto Talk	—	Off	On/Off
	Auto Intercom	—	Off	On/Off
Registration	Register H.set *(Register handset)*	—	—	—
Select Base	—	—	Auto	Auto/Base 1/Base 2/Base 3/Base 4 *2
Other Options	Handset PIN	—	0000	—
	Handset Name	—	—	—
	Keytones	—	On	On/Off
	Voice ABH	—	On	On/Off
	Reset Handset	—	—	—

*1 Only the handset which is registered can be selected after you set to “On”.

*2 Here, only the case that a handset is registered to a maximum of 4 Base units is mentioned.

Note:

- The items with a mark “**” are not shown on the display.

4.5. For Service Hint

Items	Contents
Battery	You could use other rechargeable batteries sold in a market, but the unit is not guaranteed to work properly.
PIN Code	If you forget Base Unit or Handset PIN code, press ✱7000 as a PIN code. This is called "super password" and is effective when you have forgotten the PIN code.

5 DISASSEMBLY INSTRUCTIONS

5.1. Base Unit

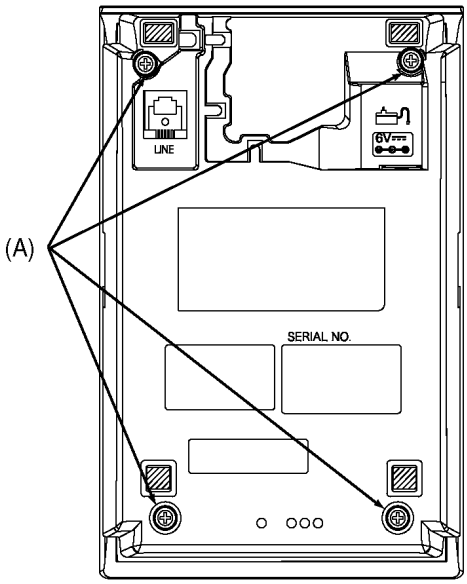


Fig. 1

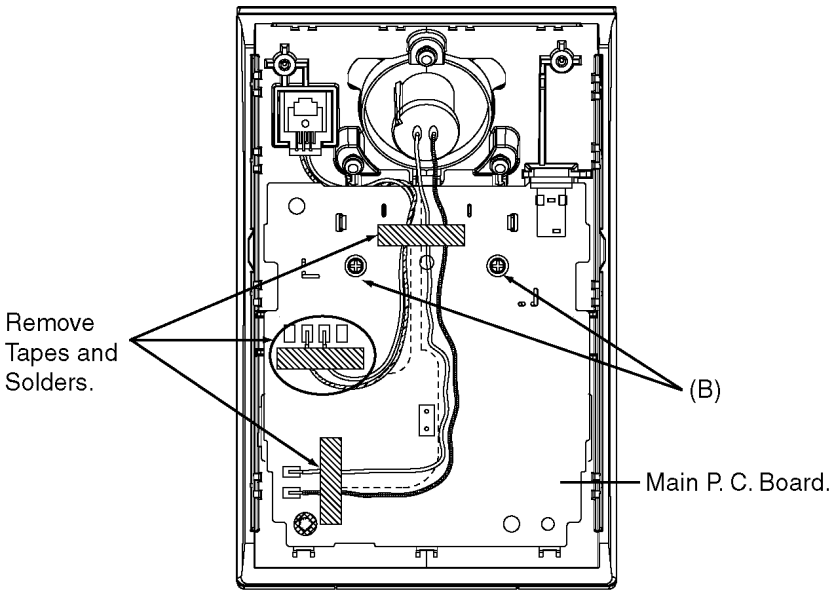


Fig. 2

Shown in Fig.-	To Remove	Remove
1	Cabinet Cover	Screws (2.6 × 12).....(A) × 4
2	Main P.C. Board	Tapes and Solders
		Screws (2.6 x 10).....(B) × 2

5.2. Handset

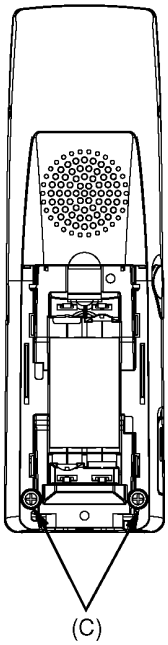


Fig. 3

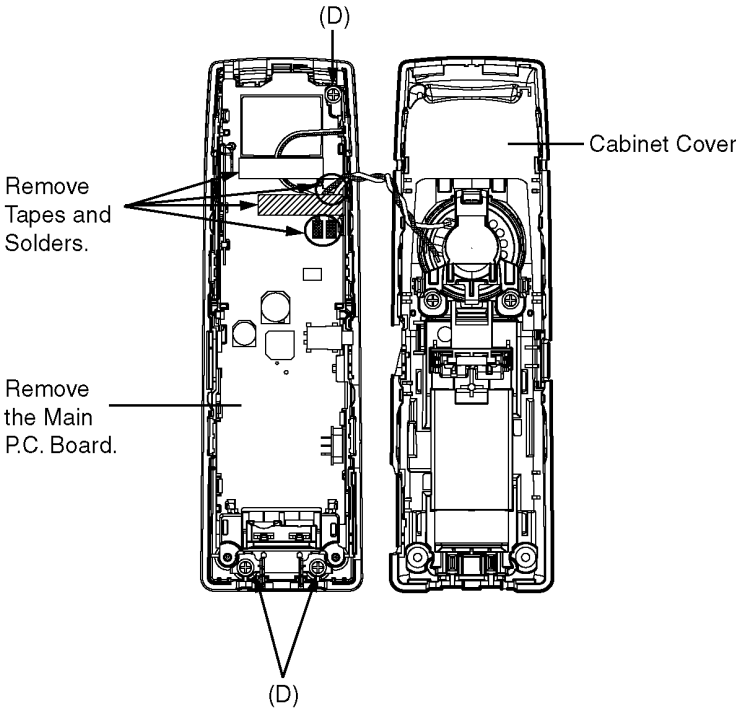
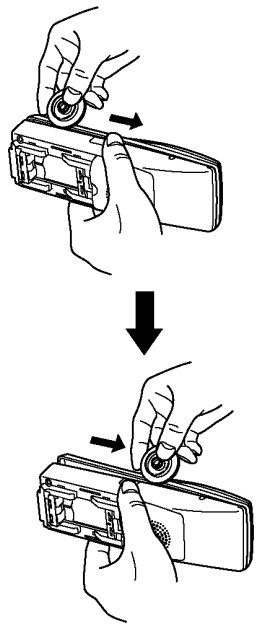
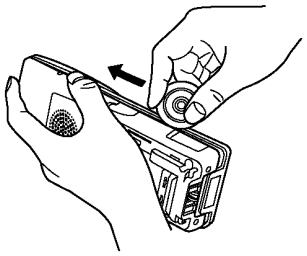


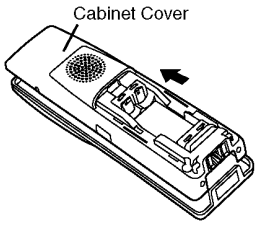
Fig. 5



Insert s 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. 4

Shown in Fig.-	To Remove	Remove
3	Cabinet Cover	Screws (2 × 10).....(C) × 2
4		Follow the procedure.
5	Main P.C. Board	Screws (2 × 10).....(D) × 3
		Tapes and Solders
		Main P.C. Board

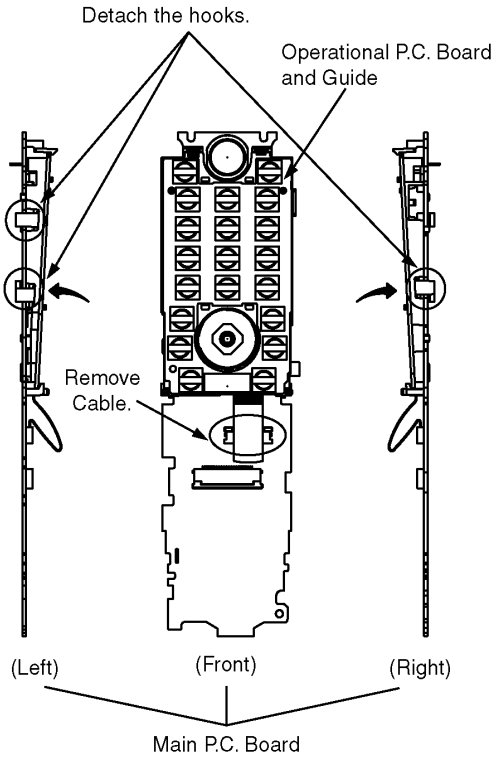


Fig. 6

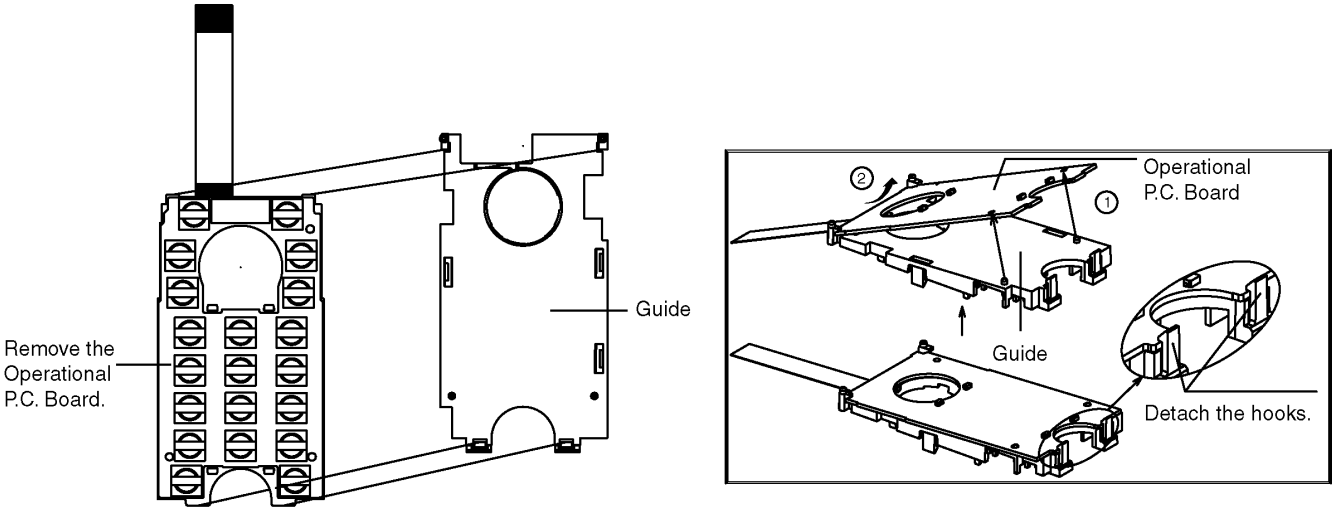


Fig. 7

Shown in Fig.-	To Remove	Remove
6	Operational P.C. Board and Guide	Cable
7	Operational P.C. Board	Guide
		Operational P.C. Board

5.3. Charger Unit

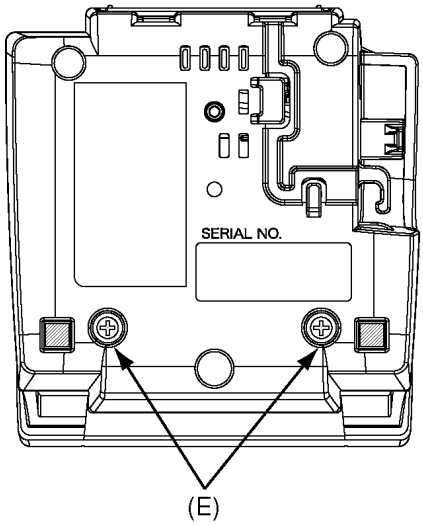


Fig. 8

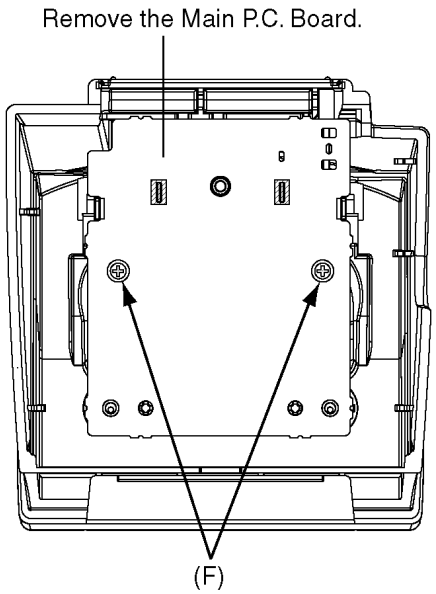
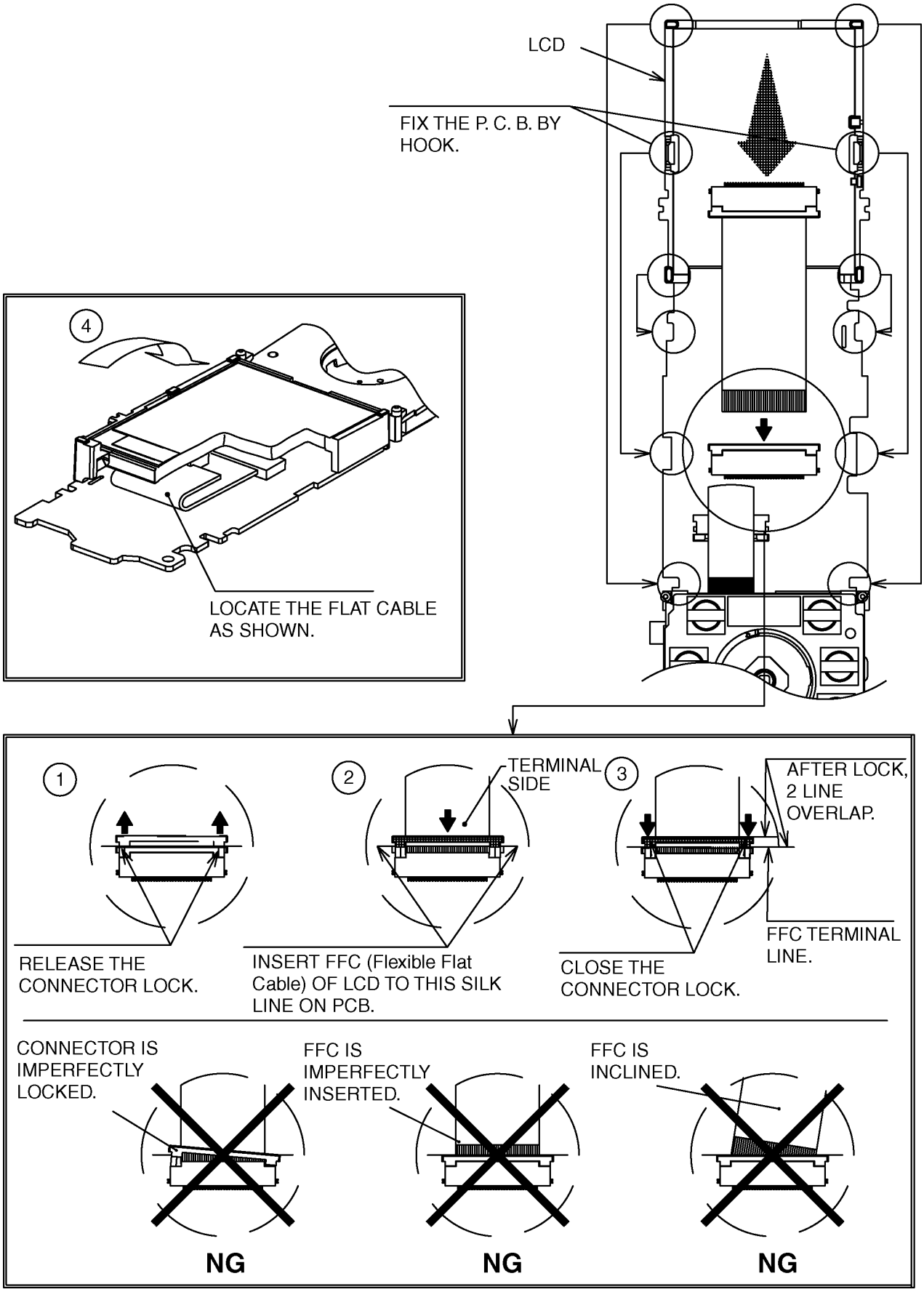


Fig. 9

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

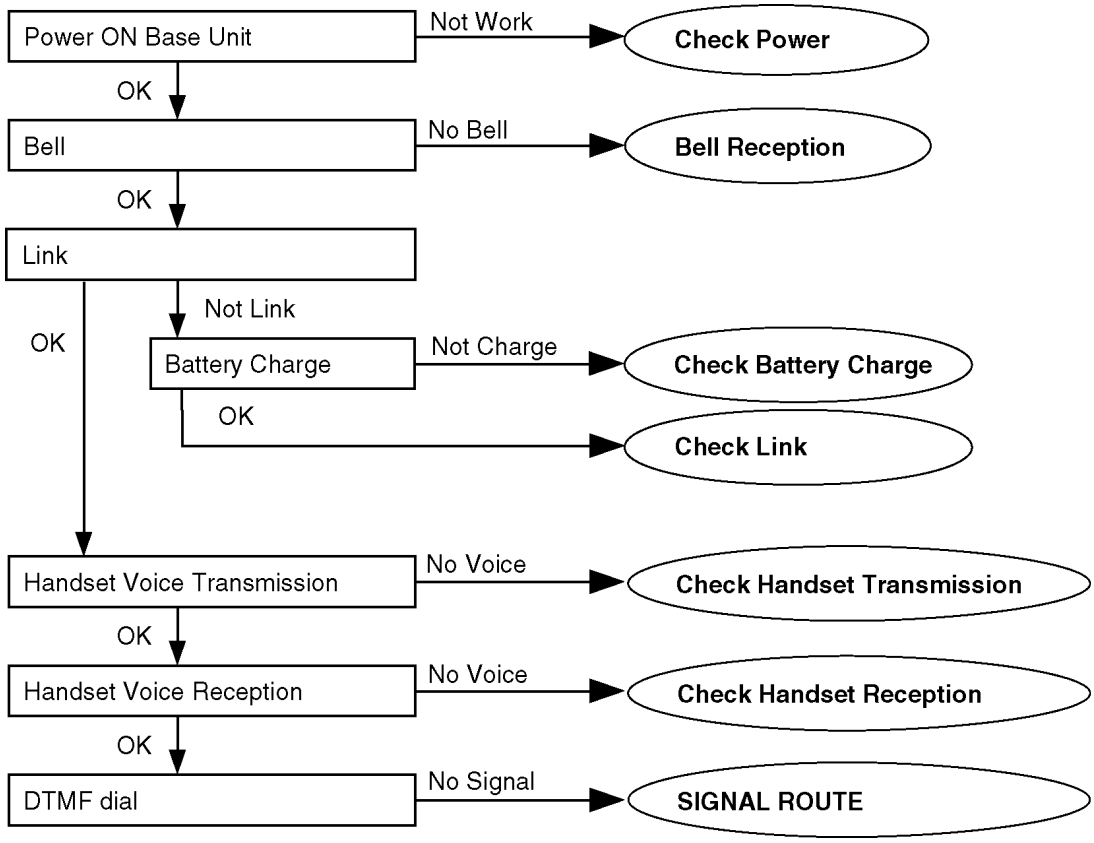
6 ASSEMBLY INSTRUCTIONS

6.1. Fix the LCD to the Main P.C.Board (Handset)



7 TROUBLESHOOTING FLOWCHART

Flow Chart



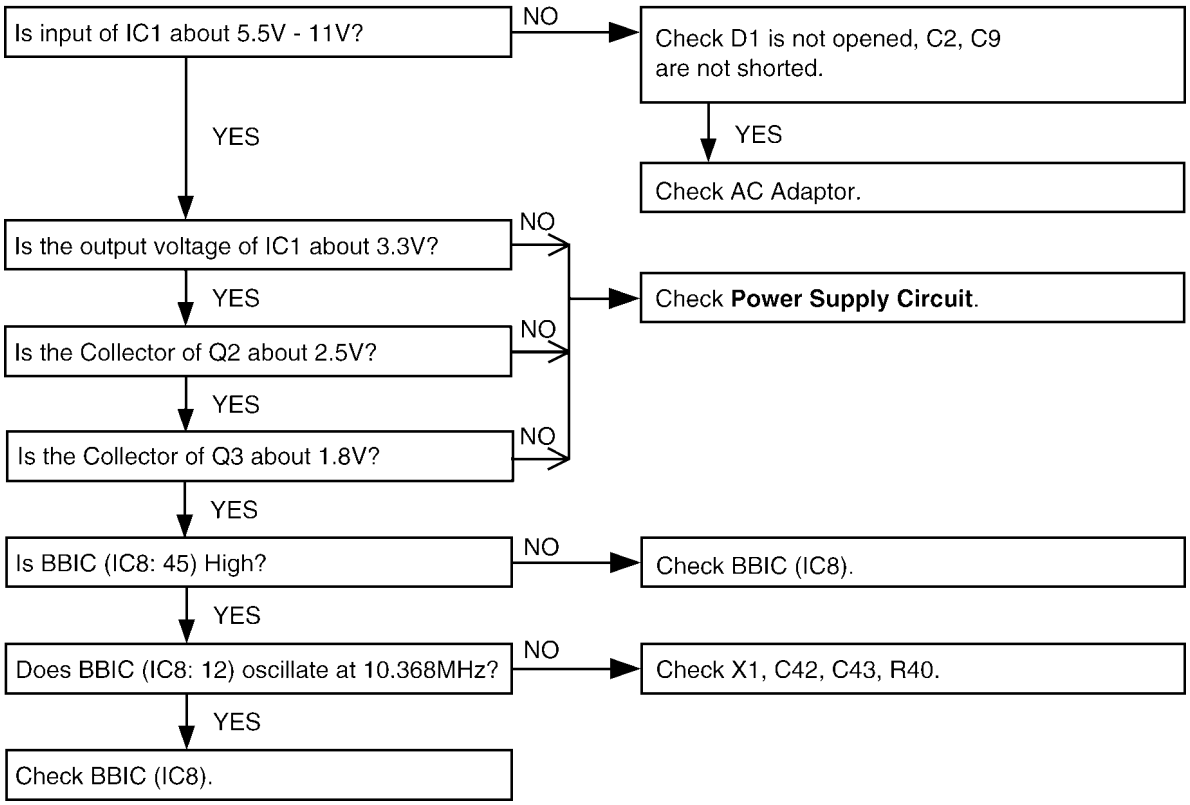
Cross Reference:

Check Power (P.18)
Bell Reception (P.25)
Check Battery Charge (P.19)
Check Link (P.20)
Check Handset Transmission (P.24)
Check Handset Reception (P.24)
SIGNAL ROUTE (P.53)

7.1. Check Power

7.1.1. Base Unit

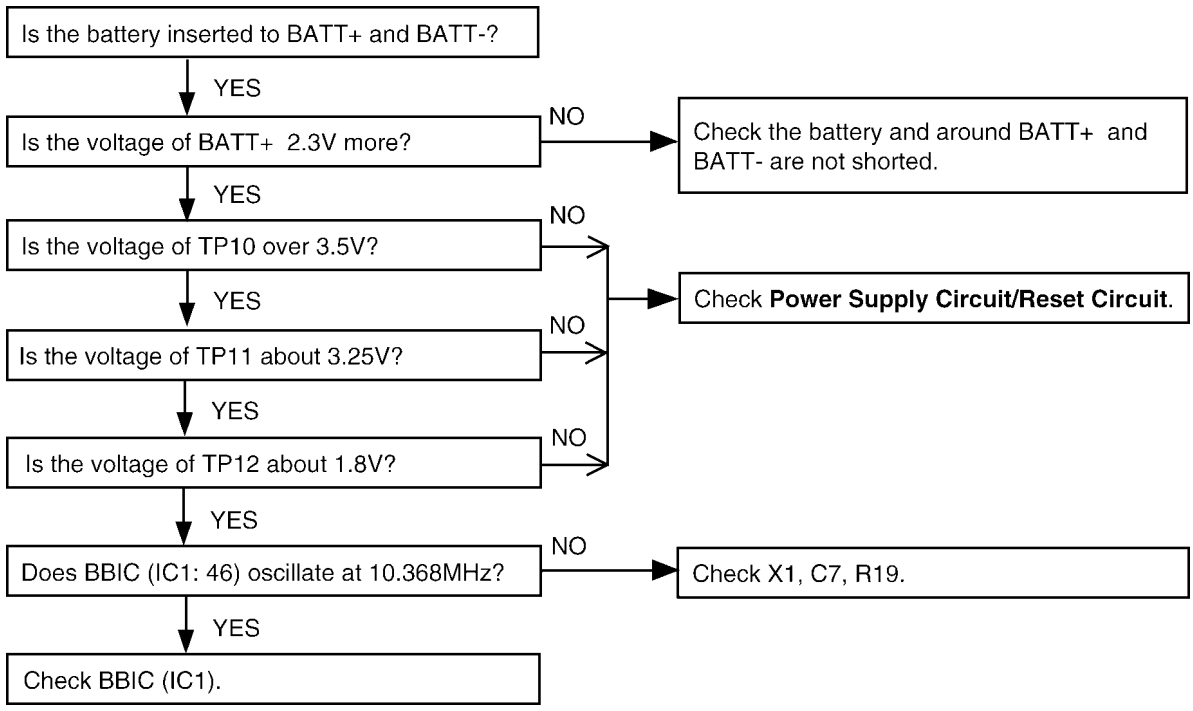
Is the AC Adaptor inserted into AC outlet? (Check AC Adaptor's specification.)



Cross Reference:

Power Supply Circuit (P.47)

7.1.2. Handset

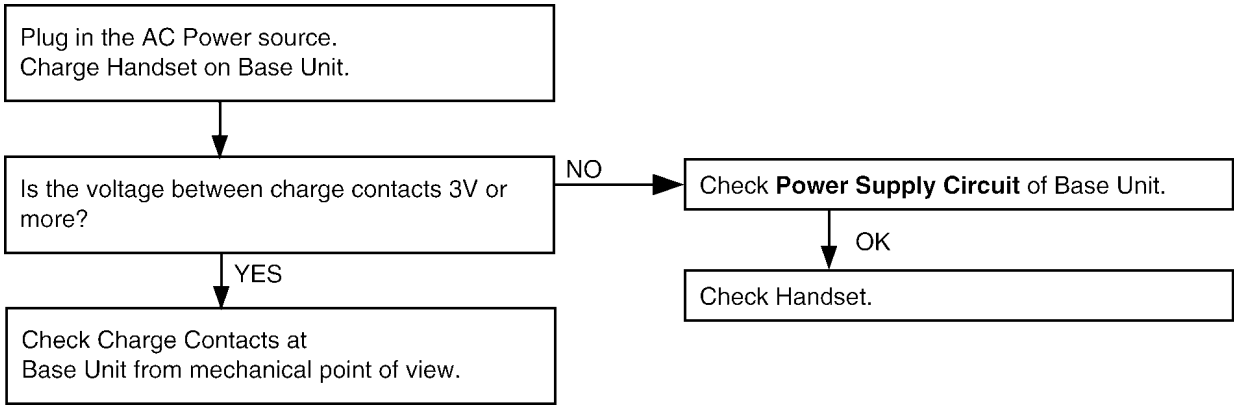


Cross Reference:

Power Supply Circuit/Reset Circuit (P.50)

7.2. Check Battery Charge

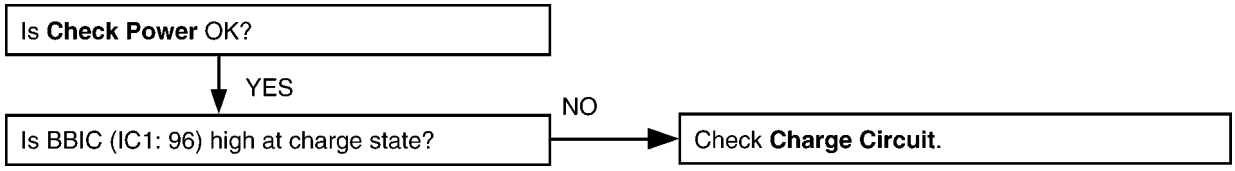
7.2.1. Base Unit



Cross Reference:

Power Supply Circuit (P.47)

7.2.2. Handset

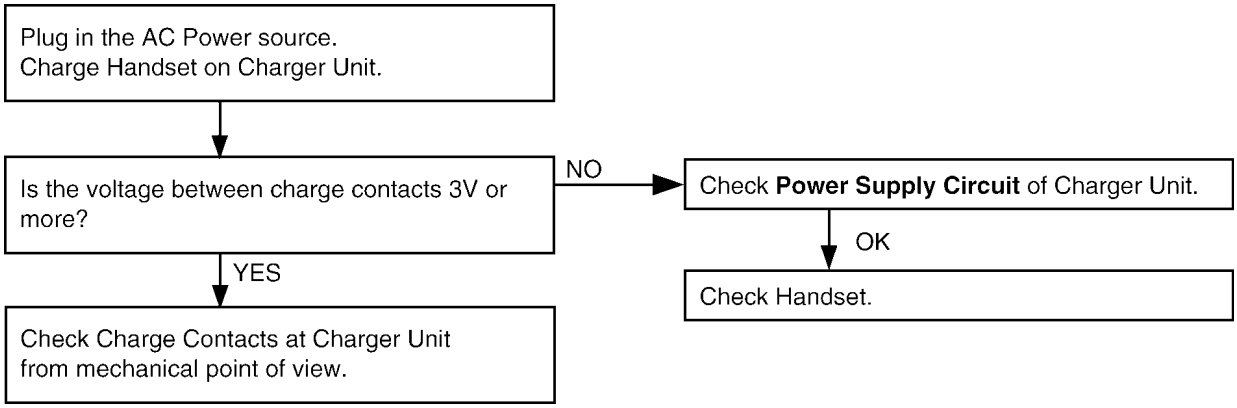


Cross Reference:

Check Power (P.18)

Charge Circuit (P.50)

7.2.3. Charger Unit

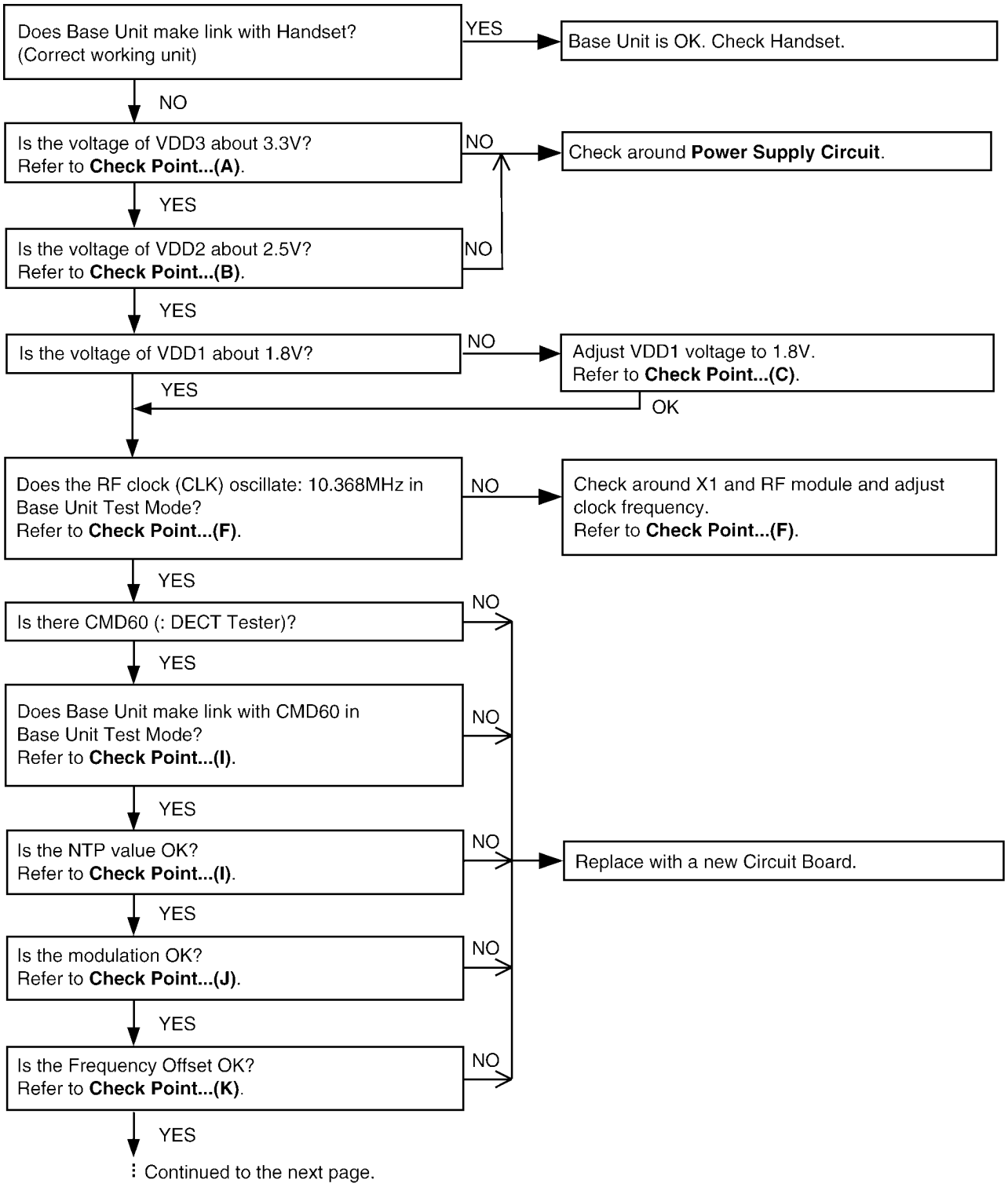


Cross Reference:

Power Supply Circuit (P.52)

7.3. Check Link

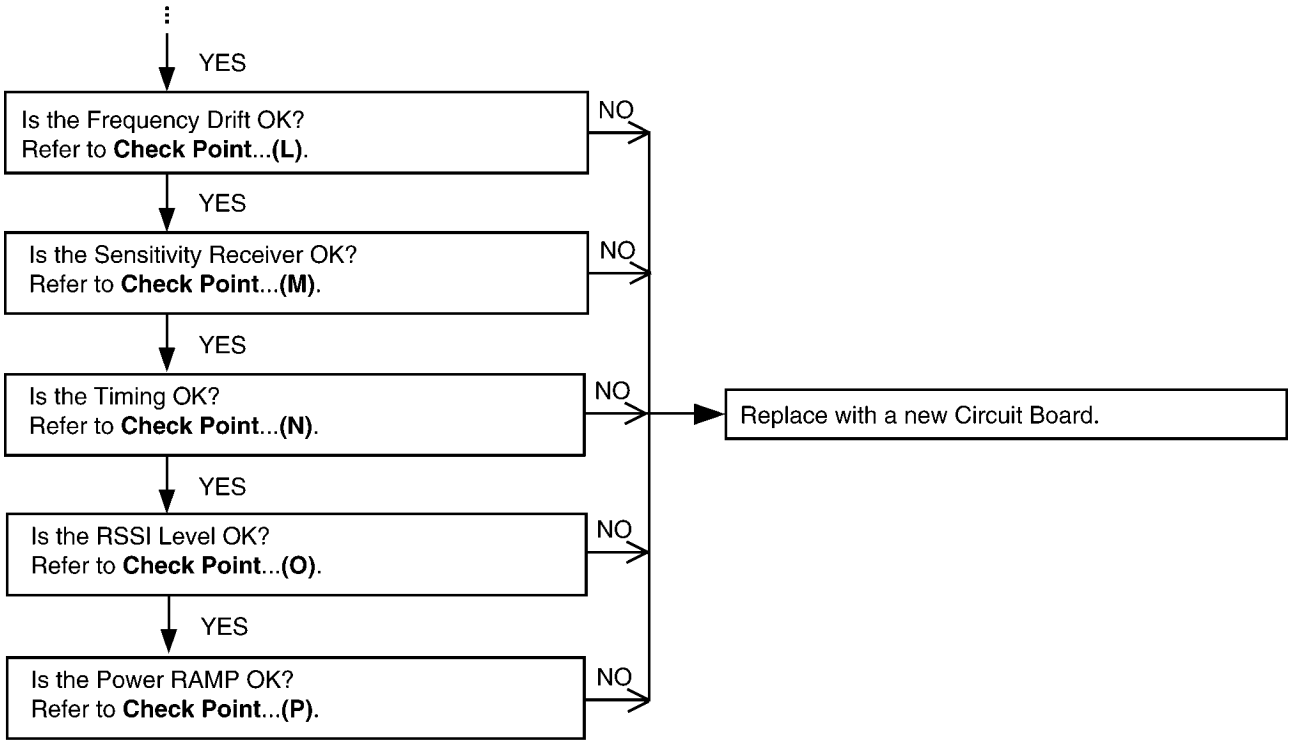
7.3.1. Base Unit



Cross Reference:

Power Supply Circuit (P.47)

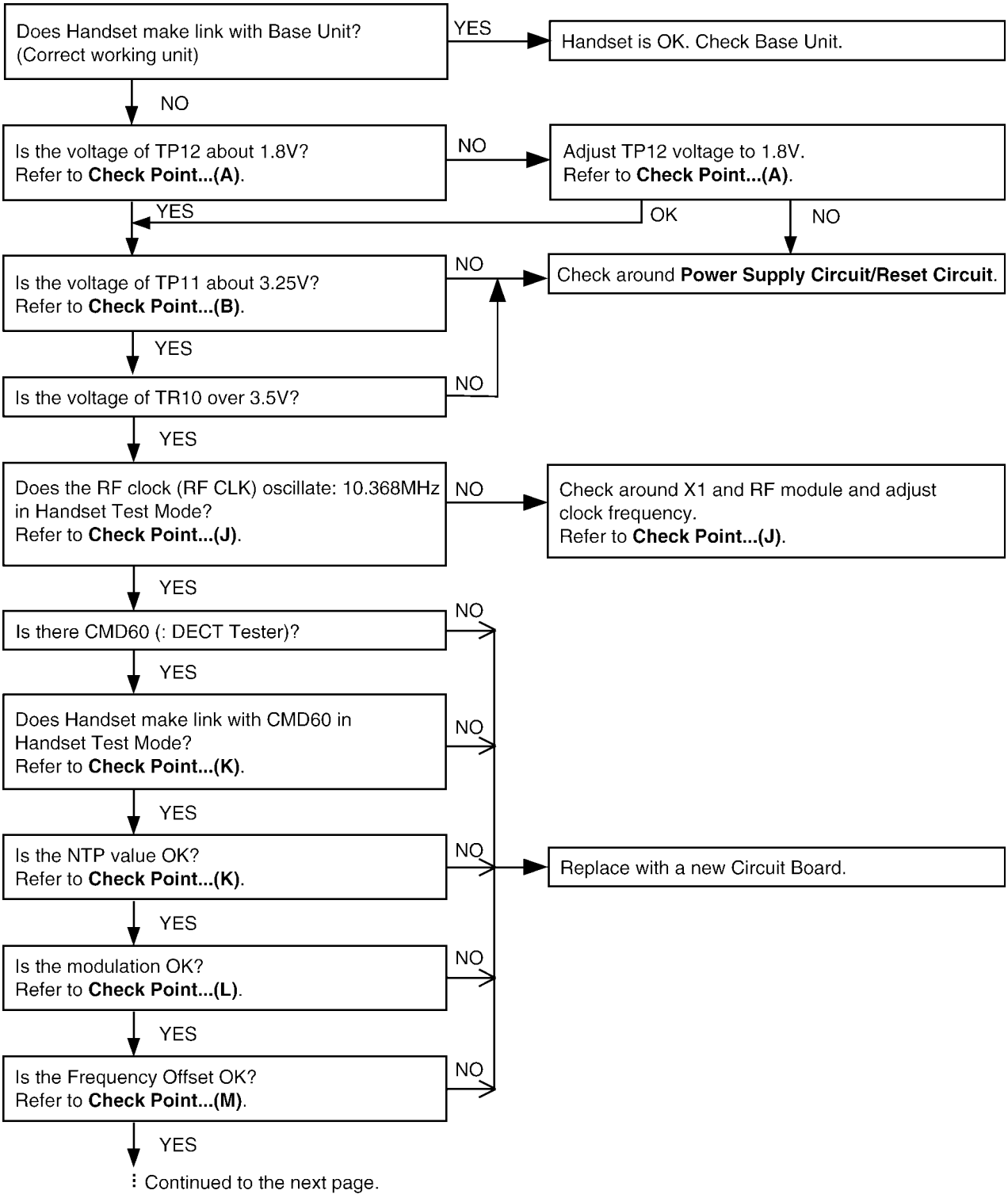
Check Point (Base Unit) (P.26)



Cross Reference:

Check Point (Base Unit) (P.26)

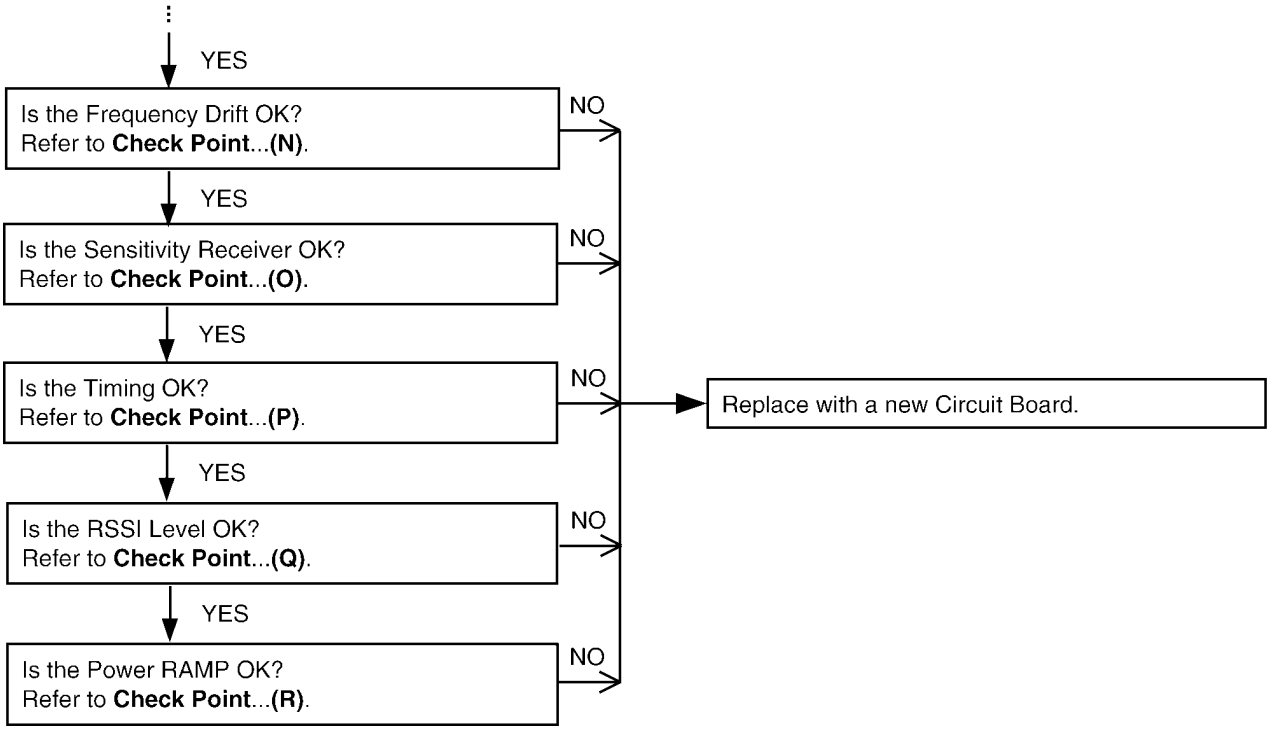
7.3.2. Handset



Cross Reference:

Power Supply Circuit/Reset Circuit (P.50)

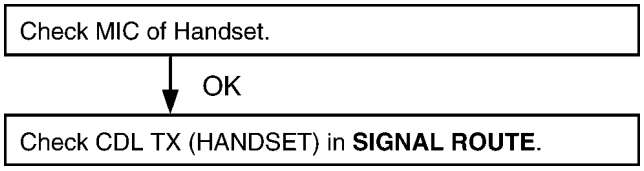
Check Point (Handset) (P.35)



Cross Reference:

Check Point (Handset) (P.35)

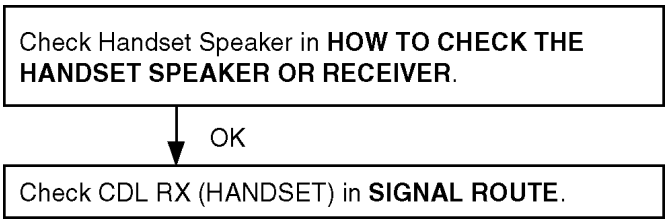
7.4. Check Handset Transmission



Cross Reference:

SIGNAL ROUTE (P.53)

7.5. Check Handset Reception



Cross Reference:

HOW TO CHECK THE HANDSET SPEAKER OR RECEIVER (P.44).

SIGNAL ROUTE (P.53)

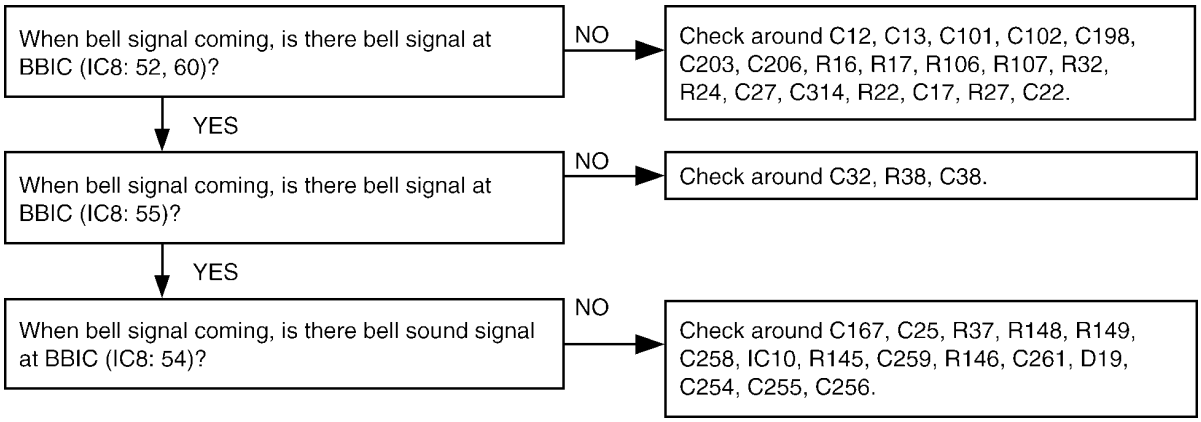
7.6. Check Caller ID

Cross Reference:

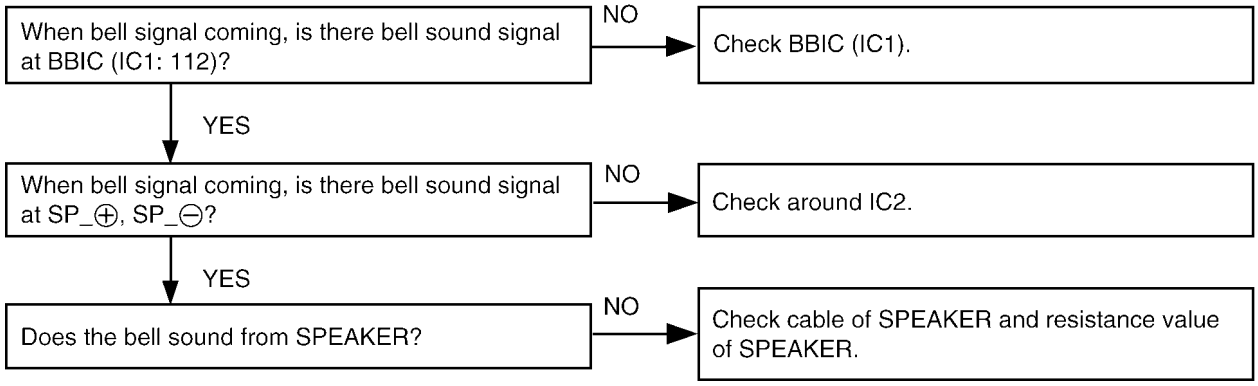
SIGNAL ROUTE (P.53)

7.7. Bell Reception

7.7.1. Base Unit



7.7.2. Handset



Cross Reference:

Telephone Line Interface (P.48)

Check Link (P.20)

HOW TO CHECK THE HANDSET SPEAKER OR RECEIVER (P.44)

8 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**)-(**H**).	Check item (**A**)-(**H**), (**I**)-(**P**).
You cannot hear the caller's voice.	Check item (**A**)-(**F**).	Check item (**A**)-(**F**), (**I**)-(**P**), (**Q**).
You cannot use handset a little away from base unit even if the handset is within range of the base unit.	-	Check item (**I**)-(**P**).
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**).

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.26)

8.1. Check Point (Base Unit)

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

Note:

After the measuring, sock up the solder of TP.

*: **PC Setting** (P.39) is required beforehand.

The connections of simulator equipments are as shown in **Adjustment Standard (Base Unit)** (P.32).

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)	3.3V Supply Confirmation	VDD3	1. Confirm that the voltage between test point VDD3 and GND is 3.3V ± 0.2V.	D1, IC1, C1, C9, C114, C3, C8, C2, R8, R9
(**B**)	2.5V Supply Confirmation	VDD2	1. Confirm that the voltage between test point VDD2 and GND is 2.5V ± 0.2V.	Q2, C5, C7
(**C**)*	1.8V Supply Confirmation	VDD1	1. Confirm that the voltage between test point VDD1 and GND is 1.8V ± 0.1V.	Q3, C11, D20, R161, L15, 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: 6F50 / program number: D661ZB	IC8, X1, C42, C43, R40, C28, R84~R88, R64, R55~R57
(**E**)*	EEP-ROM Confirmation	-	1. EEP-ROM Confirmation (Execute the command "ChkTCD800XXrevYY.bat"). XX: country code YY: revision number 2. Confirm the returned checksum value. 3. The checksum is displayed in the last output line. **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.30).	IC3, C53, R56, R57

	Items	Check Point	Procedure	Check or Replace Parts
(**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, R124, R125, C153, X1, C42, C43, R40
(**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. (Road=600 Ω) 2. Link Handset and push dial key. 3. Confirm DTMF character. 4. Confirm that the high Group is -3dBm ± 2dBm. 5. Confirm that the low Group is -6dBm ± 2dBm.	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-GND and A_2-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

	Items	Check Point	Procedure	Check or Replace Parts
(**K**)	Frequency Offset Check	-	Follow steps 1 to 6 of **(I)**. 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
(**L**)	Frequency Dirft 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 -90dBm. 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

	Items	Check Point	Procedure	Check or Replace Parts
(**O**)*	RSSI Level Confirmation	-	Follow steps 1 to 6 of **(I)**. 7.Execute the command “readrssi”. 8. Confirm that the returned value is 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
(**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, L10, L11, C57, C134, 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 -10.5dBm ± 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 3.10V ± 0.2V.	R4, R5, D6, C107, C180, C181, D1

8.2. The Setting Method of JIG (Base Unit)

8.2.1. Preparation

8.2.1.1. 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

8.2.1.2. JIG and PC

- EEPROM serial JIG
  JIG Cable: PQZZ1CD300E*
- PC which runs in DOS mode
- **Batch file CD-ROM** for setting: PQZZTCD816UA

Note:

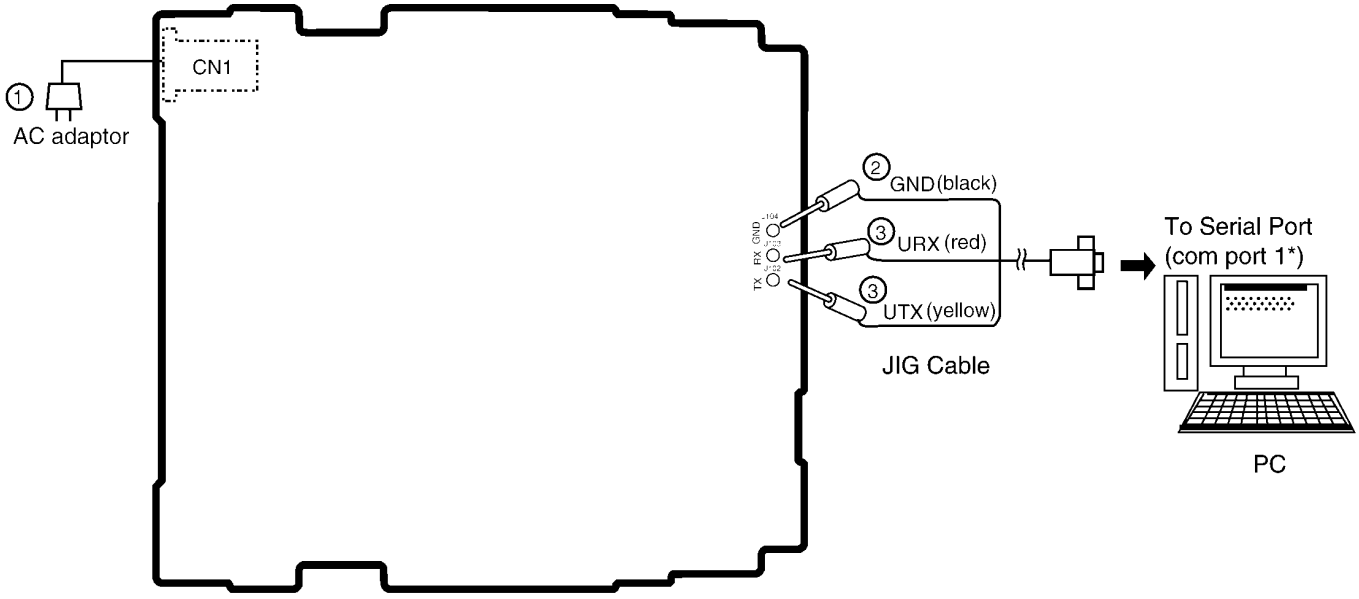
*: If you have the JIG Cable for TCD500 series (PQZZ1CD505E), change the following values of resistance. Then you can use it as a JIG Cable for both TCD300 and TCD500 series. (It is an upper compatible JIG Cable.)

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

8.2.2. PC Setting

8.2.2.1. Connections

①Connect the AC adaptor to CN1 (base unit).
②Connect the JIG Cable GND (black).
③Connect the JIG Cable URX (red) and UTX (yellow).



Base Unit

Note:

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

8.2.2.2. 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:

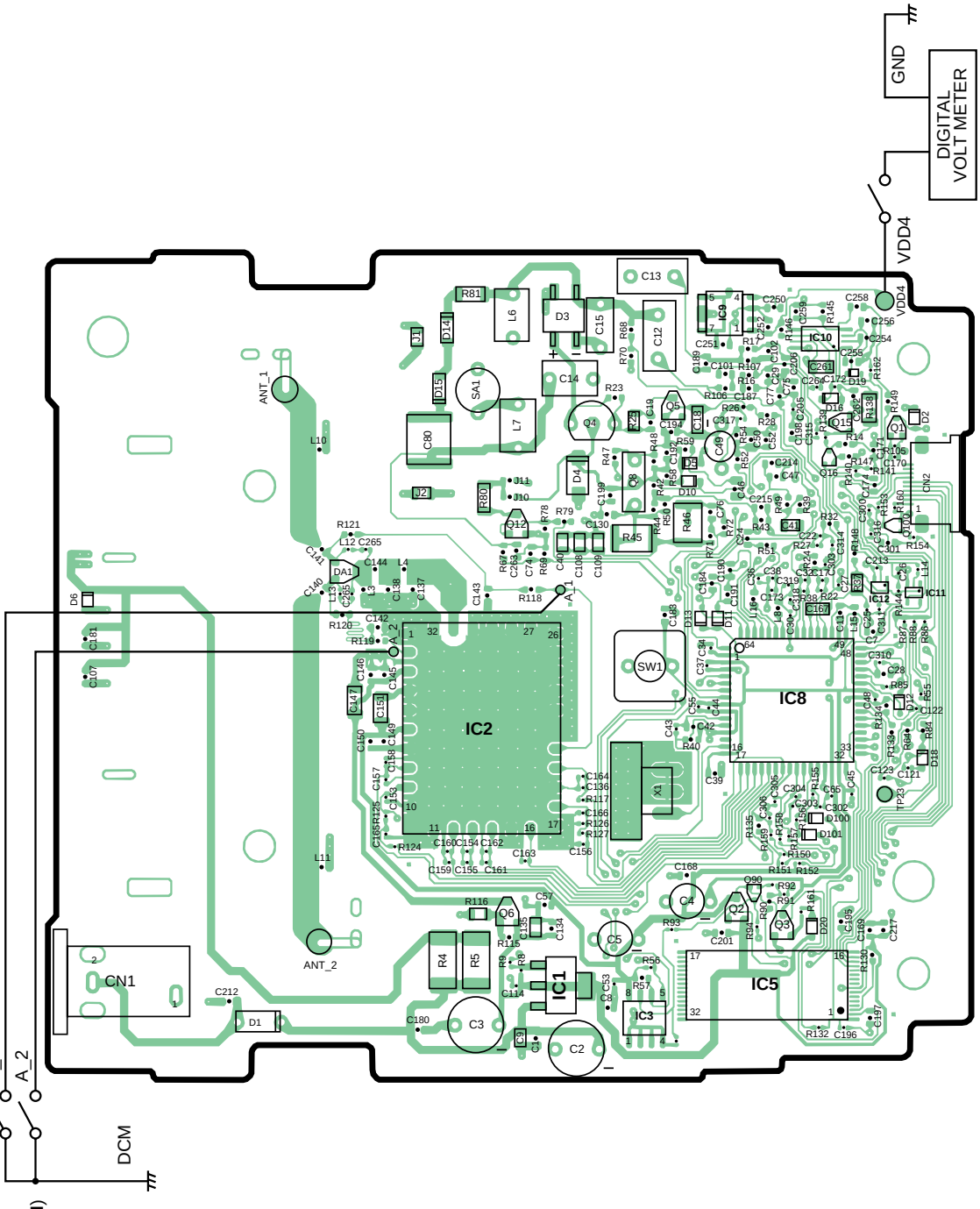
See the table below for frequently used commands.

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.

8.3. Adjustment Standard (Base Unit)

8.3.1. Component View

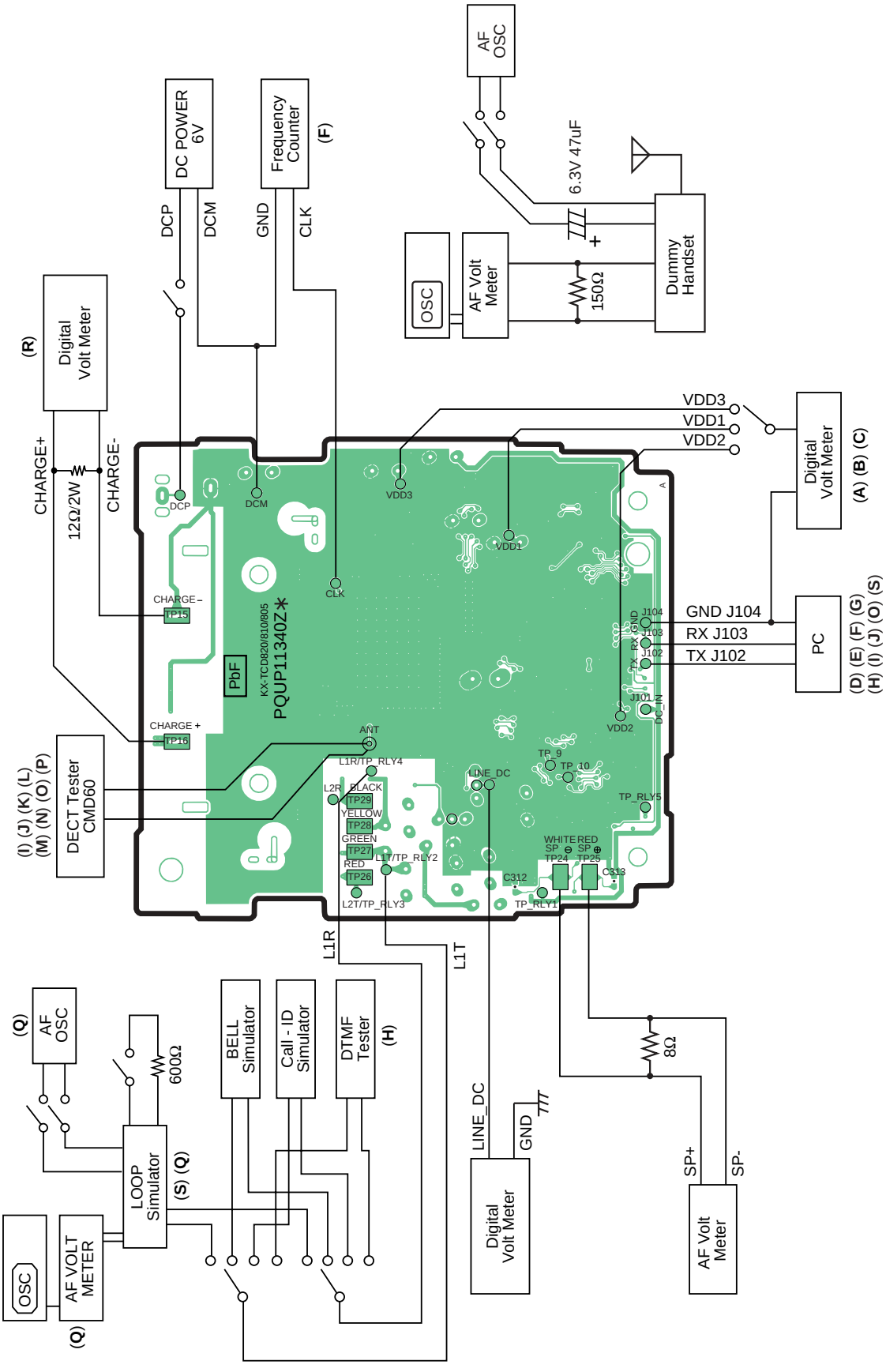
When connecting the Simulator Equipments for checking, please refer to below.



Note:

(I) - (P) is referred to **Check Point (Base Unit)** (P.26)

8.3.2. Flow Solder Side View



Note:

(A) - **(S)** is referred to **Check Point (Base Unit)** (P.26)

8.4. 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 3.10V ± 0.2V.	D2, R2, R1

Note:

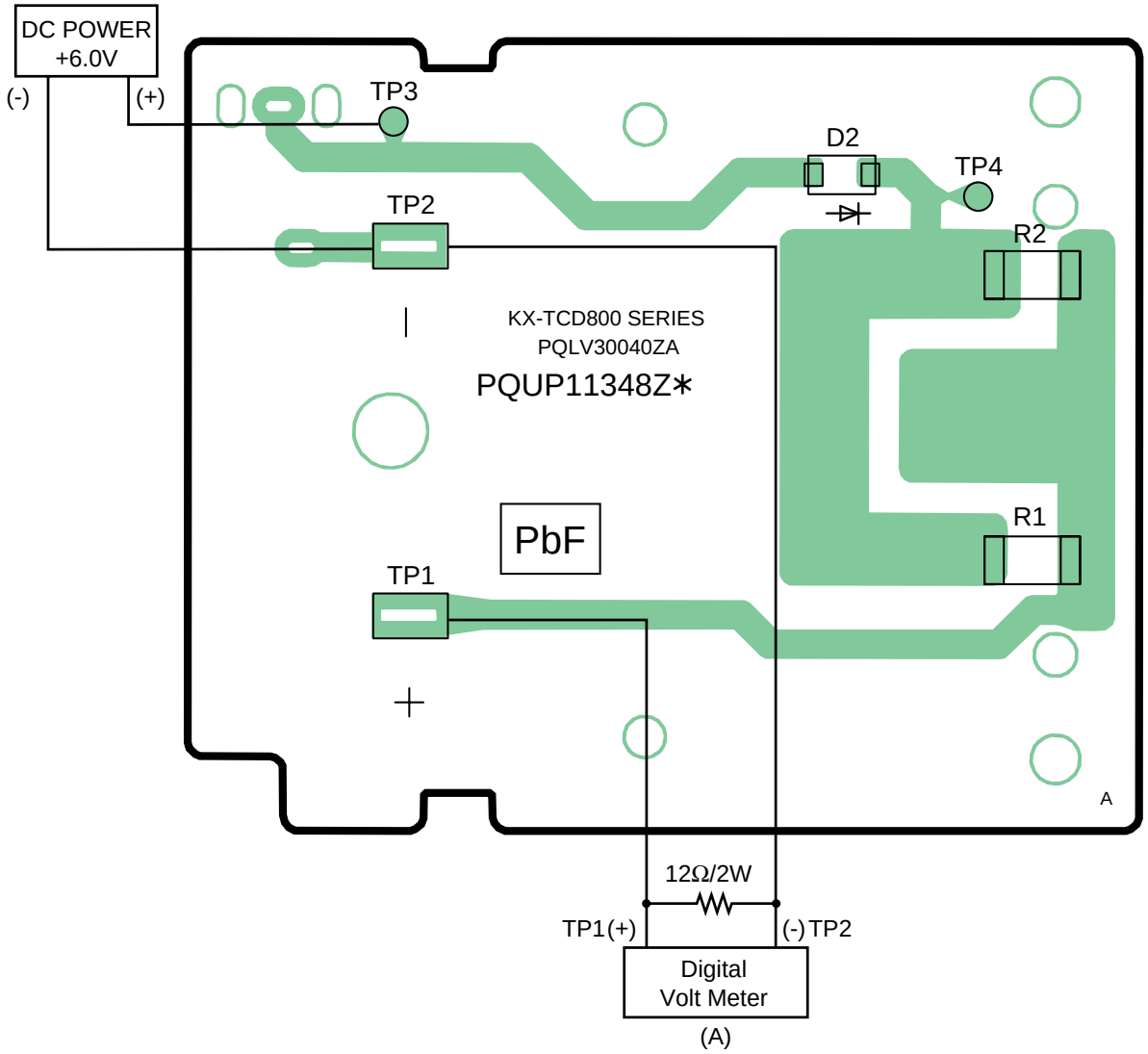
After the measuring, sock up the solder of TP.

The connection of adjustment equipment is as shown in **Adjustment Standard (Charger Unit)** (P.34).

8.5. Adjustment Standard (Charger Unit)

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

8.5.1. Flow Solder Side View



Note:

(**A**) is referred to **Check Point (Charger Unit)** (P.34)

9 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**)-(**E**), (**J**), (**S**).	Check item (**A**)-(**E**), (**J**)-(**S**).
You cannot use handset a little away from base unit even if the handset is within range of the base unit.	(**J**)	Check item (**J**)-(**R**).
Does not link between base unit and handset.	Check item (**A**)-(**E**), (**J**).	Check item (**A**)-(**E**), (**J**)-(**R**).
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.35)

9.1. Check Point (Handset)

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

Note:

After the measuring, sock up the solder of TP.

*: **PC Setting** (P.39) is required beforehand.

The connections of simulator equipments are as shown in **Adjustment Standard (Handset)** (P.41).

	Items	Check Point	Procedure	Check or Replace Parts
(**A**)*	1.8V Supply Adjustment	TP12	1. Confirm that the voltage between test point TP12 and GND is 1.8V ± 0.02V. 2. Execute the command "bandgap", then check the current Value. 3. Adjust the 1.8V voltage of TP12 executing command "bandgap XX"(XX is the value).	IC1, Q2, C40, R4
(**B**)	DC/DC Supply Confirmation	TP10	1. Confirm that the voltage between test point TP10 and GND is 3.68V ± 0.3V (Backlight is OFF)/4.45V ± 0.3V (Backlight is ON).	IC1, F1, C1, C3, C57, R1, R2, R3, Q1, D1, L1
(**C**)	3.25V Supply Confirmation	TP11	1. Confirm that the voltage between test point TP11 and GND is 3.25V ± 0.1V.	IC1, Q3, C4, C5, R9, R10, R11
(**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: B03A / program number: D742ZB	IC1, X1, C7, R19
(**E**)*	FLASH Confirmation	-	1. FLASH Confirmation (Execute the command "ChkTCA181XXrevYY.bat"). XX: country code YY: revision number 2. Confirm the returned checksum value. 3. The checksum is displayed in the last output line. **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.39).	IC10, IC11, R42, C134, R203, C102, C25, R91, R92, R13, Q8, R14, R27, Q20, R33

	Items	Check Point	Procedure	Check or Replace Parts
(**F**)	Charge Control Check & Charge Current Monitor Check	-	1. Apply 3.5V between TR18(+) and TP17(-) with DC power supply and set current limit to 500mA. 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, R5, R6, F1, R58, C136, R72, D7, L6, L7, C129, C135, R7
(**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 00 (hex).	R72, D7, L6, L7, C129, C135, R7, IC1, Q4, Q5, Q9, D6, L4, L5, R5, R6, F1, R58, C136
(**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 FLASH. ex) read data: XX = 1C, write data: YY = 1C read data: XX = 2D, write data: YY = 2D FLASH = 0004(Low Voltage) write “YY” Execute the command “wreeprom 00 04 01 YY”. FLASH = 0005(No Voltage) write “YY - 1D” Execute the command “wreeprom 00 05 01 ZZ”. FLASH = 000A(Low Voltage BL) write “YY - 06” Execute the command “wreeprom 00 0A 01 WW”. **Note:** ZZ = YY - 1D, WW = YY - 06 No Voltage writing data limit is ‘00’. c) XX: 00 ~ 17: Reject XX: 33 ~ FF: Reject	IC1, F1, C1 C3, R24, R73, C9, R8, C61, R43, R46, R47, C39
(**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, R24, R73, C9, R8, C61, R43, R46, R47, C39
(**J**)*	BBIC Clock Adjustment	CLK	1. Apply 2.5V 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 00 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, C7, R127, C117, R19, IC20, R128

	Items	Check Point	Procedure	Check or Replace Parts
(**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 ANT is 20dBm ~ 25dBm.	IC1, C117, R121, C44, C45, C125, IC18, C71, C122, C118, C119, R78, C51, C50, C83, IC20, R123~R130, C46~C49, C53~C55, R66, R76, C115
(**L**)*	Modulation Check and Adjustment	-	Follow steps 1 to 3 of **(K)**. 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, C117, R121, C44, C45, C125, IC18, C71, C122, C118, C119, R78, C51, C50, C83, IC20, R123~R130, C46~C49, C53~C55, R66, R76, C115
(**M**)	Frequency Offset Confirmation	-	Follow steps 1 to 3 of **(K)**. 4.Confirm that the frequency Offset is < ± 45kHz.	IC1, C117, R121, C44, C45, C125, IC18, C71, C122, C118, C119, R78, C51, C50, C83, IC20, R123~R130, C46~C49, C53~C55, R66, R76, C115
(**N**)	Frequency Drift Confirmation	-	Follow steps 1 to 3 of **(K)**. 4.Confirm that the frequency Drift is < ± 30kHz/ms.	IC1, C117, R121, C44, C45, C125, IC18, C71, C122, C118, C119, R78, C51, C50, C83, IC20, R123~R130, C46~C49, C53~C55, R66, R76, C115
(**O**)	Sensitivity Receiver Confirmation	-	Follow steps 1 to 3 of **(K)**. 4.Set DECT tester power to -90dBm. 5.Confirm that the BER is < 1000ppm.	IC1, C117, R121, C44, C45, C125, IC18, C71, C122, C118, C119, R78, C51, C50, C83, IC20, R123~R130, C46~C49, C53~C55, R66, R76, C115

	Items	Check Point	Procedure	Check or Replace Parts
(**P**)	Timing Confirmation	-	Follow steps 1 to 3 of **(K)**. 4.Confirm that the Timing accuracy is < ± 2.0ppm.	IC1, C117, R121, C44, C45, C125, IC18, C71, C122, C118, C119, R78, C51, C50, C83, IC20, R123~R130, C46~C49, C53~C55, R66, R76, C115
(**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 1B ± 8 (hex). 7.Set DECT tester power to -63dBm. 8.Execute the command “readrssi”. 9.Confirm that the returned value is 23 ± 8 (hex).	IC1, C117, R121, C44, C45, C125, IC18, C71, C122, C118, C119, R78, C51, C50, C83, IC20, R123~R130, C46~C49, C53~C55, R66, R76, C115
(**R**)	Power RAMP Confirmation	-	Follow steps 1 to 3 of **(K)**. 4.Confirm that Power RAMP is matching.	IC1, C117, R121, C44, C45, C125, IC18, C71, C122, C118, C119, R78, C51, C50, C83, IC20, R123~R130, C46~C49, C53~C55, R66, R76, C115
(**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 -10.5dBm ± 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 REV-TEST1 and REV-TEST2. 6. Confirm that the level is -20.5dBm ± 2dBm and that the distortion level is < 5% at Receiver. (vol = 2)	IC1, R37, R38, C14, C17, C89, C10, R26, C36, C35, C90, R29, C12, C87, R25, C60, C68, D4, D5, C37, C91, C150, C152, C42, R75, R55, R56
(**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 -20dBm/1KHz to Line I/F and measure Receiving level at SP1 and SP2. 5. Confirm that the level is -8dBm ± 2dBm and that the distortion level is < 5%. (vol = 3)	R80, C92, IC2, D8, C16, C86, C13, R35, C75, R36, C38, C77, R74, C80, C15, IC1, R37, R38, C14, C17, C89, C10, R26, C36, C35, C90, R29, C12, C87, R25, C60, C68, C37, C91, C150, C152, C42, R75

9.2. The Setting Method of JIG (Handset)

9.2.1. Preparation

9.2.1.1. 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.
- 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

9.2.1.2. JIG and PC

- FLASH serial JIG
  JIG Cable: PQZZ1CD300E*
- PC which runs in DOS mode.
- **Batch file CD-ROM** for setting: PQZZTCD816UA

Note:

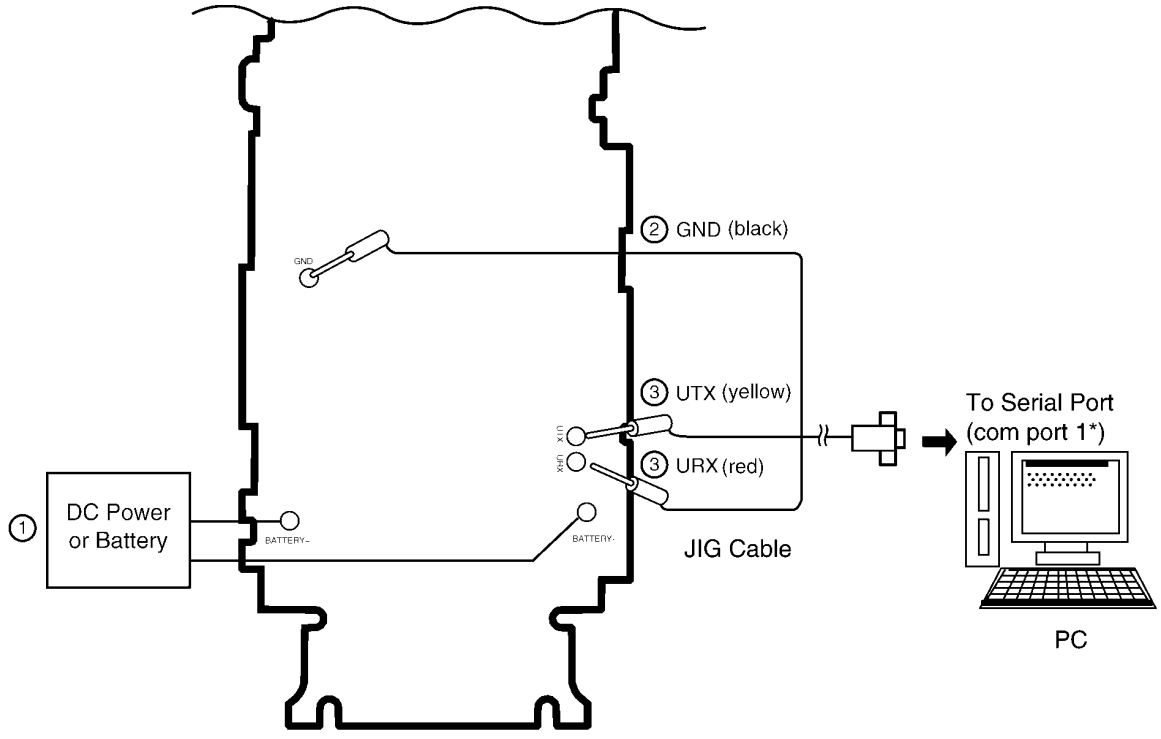
*: If you have the JIG Cable for TCD500 series (PQZZ1CD505E), change the following values of resistance. Then you can use it as a JIG Cable for both TCD300 and TCD500 series. (It is an upper compatible JIG Cable.)

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

9.2.2. PC Setting

9.2.2.1. Connections

①Connect the DC Power or Battery to Battery+ and Battery- (Handset).
②Connect the JIG Cable GND (black).
③Connect the JIG Cable UTX (yellow) and URX (red).



Handset

Note:

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

9.2.2.2. 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”.

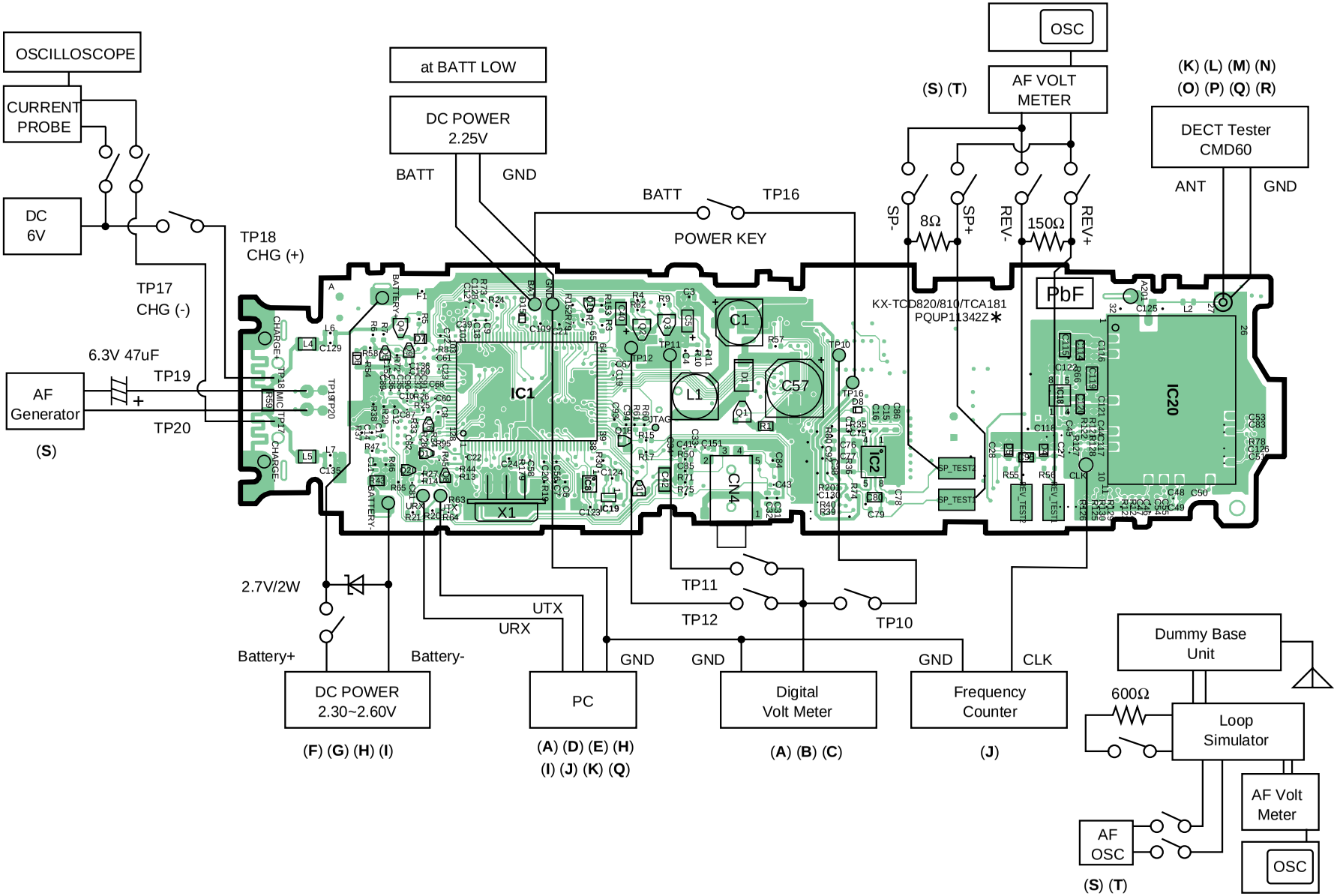
Note:

See the table below for frequently used commands.

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

9.3. Adjustment Standard (Handset)

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



Note:

(**A**) - (**T**) is referred to **Check Point (Handset)** (P.35)

10 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.

10.1. Base Unit

IC		Necessary Adjustment
BBIC	Programs for Voice processing, interface for RF and EEPROM	1. Default batch file: Execute the command “default.bat”. 2. Country version batch file: Execute the command “TCD800XXrevYY.bat”. (*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 “00”. 2. Default batch file: Execute the command “default.bat”. 3. Country version batch file: Execute the command “TCD800XXrevYY.bat”. (*1) 4. Clock adjustment: Refer to Check Point (F). (*2)

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.30).

(*2) Refer to **Check Point (Base Unit)** (P.26)

10.2. Handset

IC		Necessary Adjustment
BBIC	Programs for Voice processing, interface for RF and FLASH	1. Default batch file: Execute the command “default.bat”. 2. Country version batch file: Execute the command “TCA181XXrevYY.bat”. (*3) 3. Clock adjustment: Refer to Check Point (I). (*4) 4. 1.8 V setting and battery low detection: Refer to Check Point (A), (G) and (H). (*4)
FLASH	Program and Adjustment parameter data (country version batch file, default batch file, etc.)	1. Default batch file: Execute the command “default.bat”. 2. Country version batch file: Execute the command “TCA181XXrevYY.bat”. (*3) 3. Clock adjustment: Refer to Check Point (I). (*4) 4. 1.8 V setting and battery low detection: Refer to Check Point (A), (G) and (H). (*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.39).

(*4) Refer to **Check Point (Handset)** (P.35)

11 RF SPECIFICATION

11.1. Base Unit

Item	Value	Refer to -. *
TX Power	20 dBm ~ 25 dBm	**Check Point (Base Unit) (I)**
Modulation	-350 ~ -400/+320 ~ +370 kHz/div	**Check Point (Base Unit) (J)**
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	22 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.26)

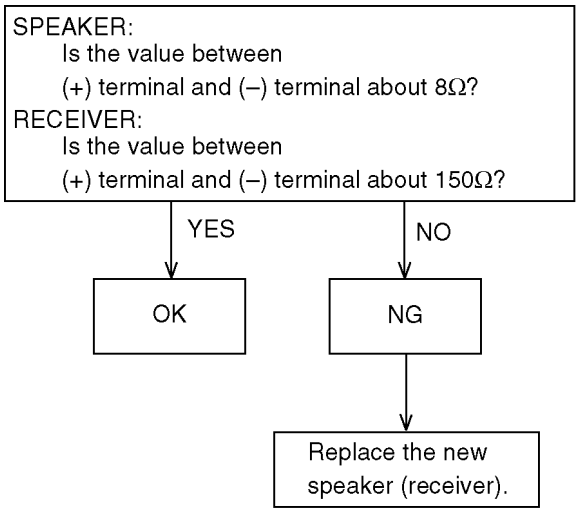
11.2. Handset

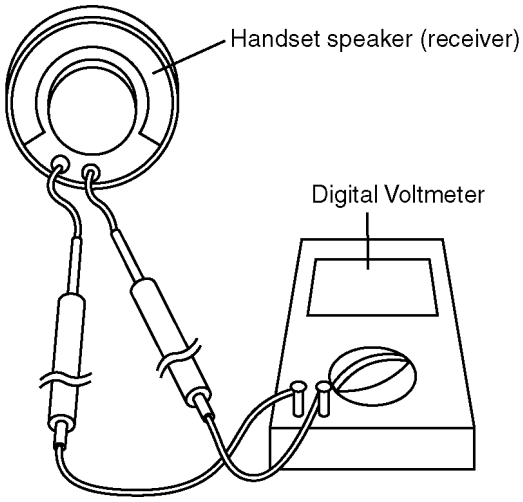
Item	Value	Refer to -. **
TX Power	20 dBm ~ 25 dBm	**Check Point (Handset) (K)**
Modulation	-350 ~ -400/+320 ~ +370 kHz/div	**Check Point (Handset) (L)**
Frequency Offset	-45 kHz ~ +45 kHz	**Check Point (Handset) (M)**
Frequency Drift	< ± 30 kHz / ms	**Check Point (Handset) (N)**
RX Sensitivity	< 1000 ppm	**Check Point (Handset) (O)**
Timing Accuracy	< ± 2.0 ppm	**Check Point (Handset) (P)**
RSSI Level	1B hex ± 8 hex (at -81dBm) 23 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.35)

12 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.





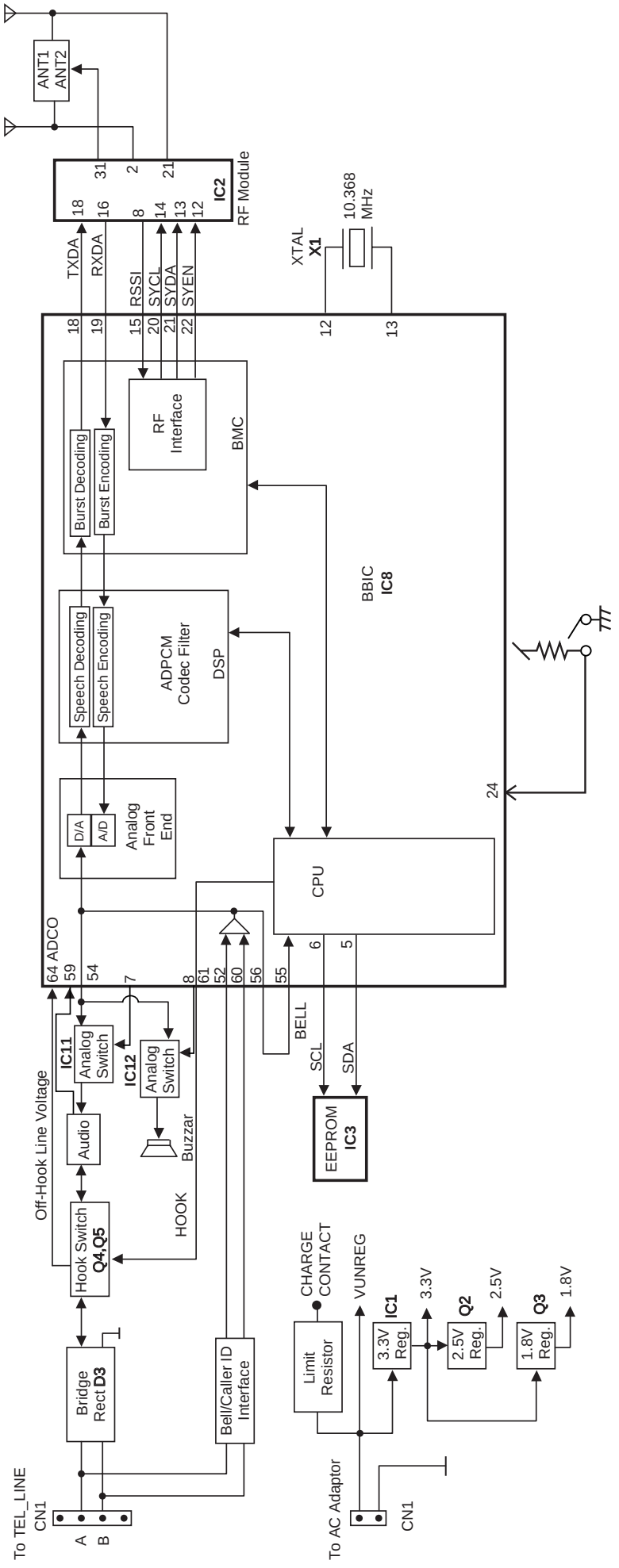
13 FREQUENCY TABLE (MHz)

	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.

14 BLOCK DIAGRAM (BASE UNIT)



KX-TCD816 BLOCK DIAGRAM (BASE UNIT)

15 CIRCUIT OPERATION (BASE UNIT)

15.1. Outline

Base Unit consists of the following ICs as shown in **BLOCK DIAGRAM (BASE UNIT)** (P.45).

- 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 code filter for speech encoding and speech decoding (DSP section)
  - Echo-cancellation and Echo-suppression (DSP section)
  - Any tones (tone, sidetone, ringing tone, etc.) generation (DSP section)
  - DTMF receiver (DSP section)
  - Clock Generation for RF Module
  - ADC, DAC, timer, and power control circuitry
  - All interfaces (ex: RF module, EEPROM, LED, Analog Front End, etc.)
- RF Module: IC2
  - PLL Oscillator
  - Detector
  - Compress/Expander
  - First 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

15.2. 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

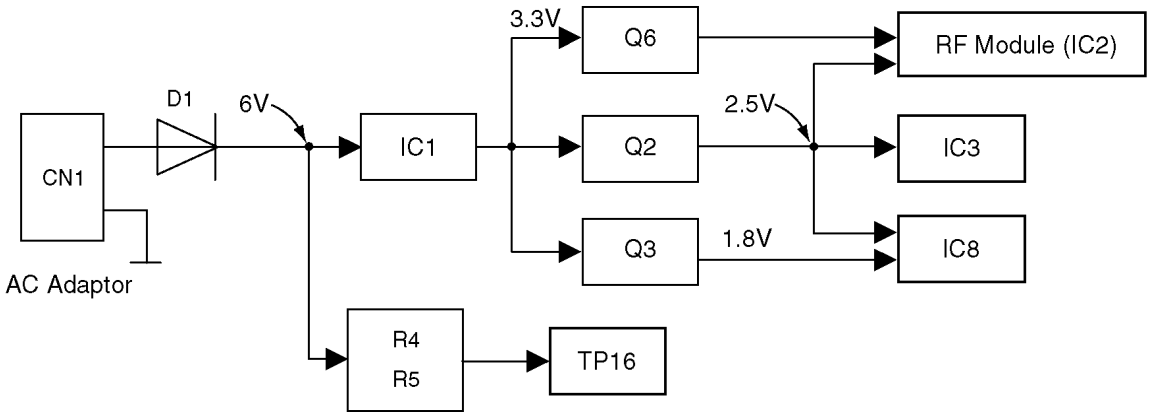
  CN1 (+6V) → D1 → IC1 → Q3 → IC8
- RF Module (IC2):

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

  CN1 (+6V) → D1 → IC1 → Q6 → IC2 (Power AMP)
- EEPROM (IC3):

  CN1 (+6V) → D1 → IC1 → Q2 → IC3
- Charge Contact (TP16):

  CN1 (+6V) → D1 → R4, R5 → TP16



<Fig.101>

15.3. Telephone Line Interface

<Function>

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

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

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

When ring voltage appears at the TP28 (A) and TP27 (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**]

15.4. Transmitter/Receiver

- Audio Circuits and DTMF tone signal circuits.

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

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

Signal Path:

*Refer to **SIGNAL ROUTE** (P.53).

15.4.1. 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.45)

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.

15.4.2. Receiver Block

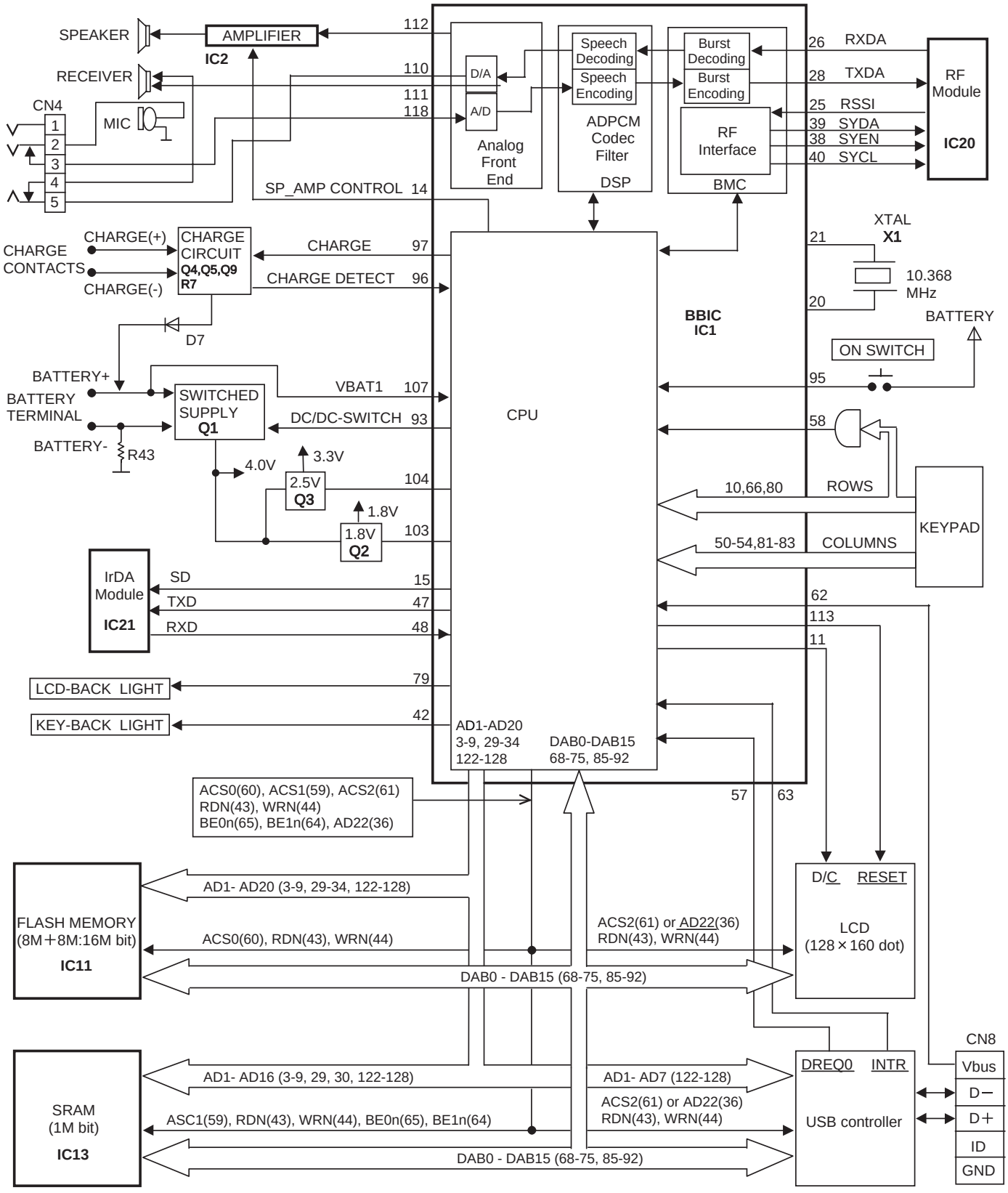
The signal of 1900 MHz band (1881.792 MHz ~ 1897.344 MHz) which is input from antenna is input to IC2 as shown in **BLOCK DIAGRAM (BASE UNIT)** (P.45).

In IC2, the signal of 1900 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.

15.5. Pulse Dialling

During pulse dialing the hookswitch (Q4, Q5) is used to generate the pulses using the HOOK control signal, which is set high during pulses. To force the line impedance low during the “pause” intervals between dial pulses, the PULSE_DIAL signal turns on Q12.

16 BLOCK DIAGRAM (HANDSET)



KX-TCA181 BLOCK DIAGRAM (HANDSET)

17 CIRCUIT OPERATION (HANDSET)

17.1. Outline

Handset consists of the following ICs as shown in **BLOCK DIAGRAM (HANDSET)** (P.49).

- 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, USB_controller, IrDA, RF_module, Rom, Ram, LED, LCD)
- RF Module: IC20
  - PLL Oscillator
  - Detector
  - Compress/Expander
  - Amplifier for transmission and reception
- AMP: IC2
  - Single OP_AMP for SP
- USB controller
  - Data communication with a computer (ex. Personal computer) using the bi-directional serial interface
- IrDA (**I**nfra-**r**ed **D**ata **A**ssociation): IC21
  - Bi-directional communication using the infrared ray
- FLASH MEMORY: IC11
  - Source program data and temporary user data are stored
- RAM: IC13
  - Application data and code are temporary stored

17.2. Power Supply Circuit/Reset Circuit

Circuit Operation:

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

BATTERY(2.2 V ~ 2.6 V: BATTERY+) → F1, L1, D1 → Q2 (1.8 V), Q3 (3.3 V), Q1 (4.0 V)

The Reset signal generates IC1 (120 pin) and 1.8 V.

17.3. 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 → 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.47).

17.4. 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) ≦ 2.05 ± 50mV

  The BBIC detects this level and power down.

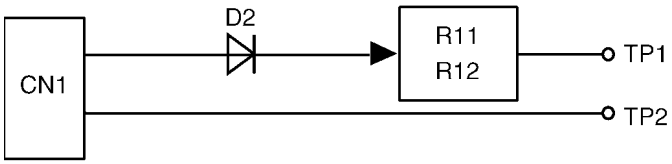
17.5. Speakerphone

The hands-free loudspeaker at SP+ and SP- works as a ringer/alarm as well. IC2 is used to switch off the telephone loudspeaker and is used to amplify the signal to drive the hands-free loudspeaker. They are selected using the SP_AMP line from pin 14 of the BBIC.

18 CIRCUIT OPERATION (CHARGER UNIT)

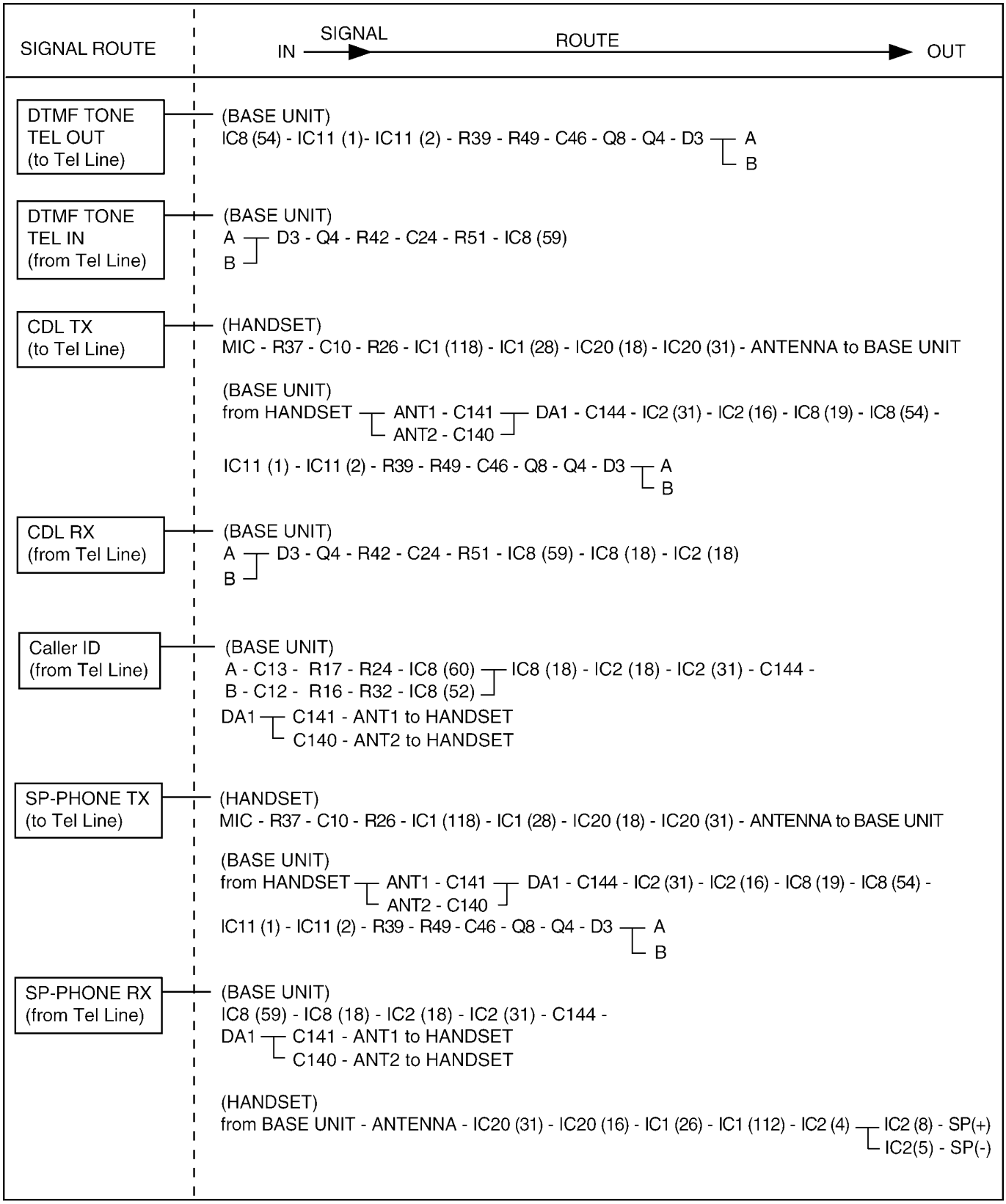
18.1. Power Supply Circuit

The power supply is as shown.



AC Adaptor

19 SIGNAL ROUTE



20 CPU DATA (BASE UNIT)

20.1. 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	VDD3	-	-	-	-
4	VSS4	-	-	-	-
5	SDA1/P2[5]	D,I/O	SDA	I/O	I
6	SCL1/P2[4]	D,O	SCL	O	I
7	INT5n/VDDE/P1[5]	D,I	NC	I	I-PU
8	INT2n/P1[2]	D,O	P1[2]	O-H	I-PU
9	AVD	-	-	-	-
10	AVS	-	-	-	-
11	CAP	A,I	CAP	I	I
12	Xtal1	A,I	Xtall	I	-
13	VSSRF	-	-	-	-
14	RFCLKp	A,O	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,O	P0[4]	O	I-PU
38	P0[5]/SPICLK/PCM_CL	D, I/O	SPICLK	O	I-PU
39	P0[6]/SPIDO/PCM_DOL	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,O	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,O	P1[4]	O	I
62	PULSE_CTRL	D,O	Q12_ON	-	Q12_OFF

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

21 CPU DATA (HANDSET)

21.1. IC1 (BBIC)

Pin No.	Description	I/O	Connection	at Normal mode	at Reset mode
1	VDDIO	-	-	-	-
2	VSS	-	-	-	-
3	AD8	D_O	DIO	O_0/1	O-0/1
4	AD9	D_O	DIO	O_0/1	O-0/1
5	AD10	D_O	DIO	O_0/1	O-0/1
6	AD11	D_O	DIO	O_0/1	O-0/1
7	AD12	D_O	DIO	O_0/1	O-0/1
8	AD13	D_O	DIO	O_0/1	O-0/1
9	AD14	D_O	DIO	O_0/1	O-0/1
10	P3[7]/PD7	D_I	DIO	I_0/1	O-Hi-Z
11	P3[1]/PD1	D_O	DIO	O_0/1	O-Hi-Z
12	P3[5]/PD5	D_O	DIO	O_0/1	O-Hi-Z
13	P3[4]/PD4	D_O	DIO	O_0/1	O-Hi-Z
14	P3[3]/PD3	D_O	DIO	O_0/1	O-Hi-Z
15	P3[2]/PD2	D_O	DIO	O_0/1	O-Hi-Z
16	VDD	-	-	-	-
17	VSS	-	-	-	-
18	RFCLK	D_O	DO	O_0/1	O-0
19	VDDRF	-	-	-	-
20	VSSRF	-	-	-	-
21	Xtal1	A_I	A1	I	I
22	CAP	A_I	A1	I	I
23	AVS	-	-	-	-
24	AVD	-	-	-	-
25	RSSI	I	A3	I	I
26	RDI	D_I	DI/AI	D_I	I(dig)
27	CMPREF	A_I	A1	D_O	I
28	TDO	DO/AO	DO/AO	DO	Hi-Z(dig)
29	AD15	D_O	DIO	O_0/1	O-0/1
30	AD16	D_O	DIO	O_0/1	O-0/1
31	AD17	D_O	DIO	O_0/1	O-0/1
32	AD18	D_O	DIO	O_0/1	O-0/1
33	AD19	D_O	DIO	O_0/1	O-0/1
34	AD20	D_O	DIO	O_0/1	O-0/1
35	AD21	D_O	DIO	O_0/1	O-0/1
36	AD22	D_O	DIO	O_0/1	O-0/1
37	AD23	D_O	DIO	O_0/1	O-0/1
38	LE	D_O	DIO	O_0/1	O-0
39	SO	D_O	DIO	O_0/1	O-Hi-Z
40	SK	D_O	DO	O_0/1	O-0
41	DAC/ADC2	A_I	AIO	A_I	I
42	P3[6]/PD6	D_O	DIO	O_0/1	O-Hi-Z
43	RDN	D_O	DIO	O_0/1	O-1
44	WRN	D_O	DIO	O_0/1	O-1
45	MI/READY	D_IPU	DIOPU	I-PU_0/1	I-PU
46	SCLK	D_O	DO	O_0/1	O-1
47	UTX/P0[0]	D_O	DIOSPU	O-PU_0/1	I-PU
48	RTX/P0[1]	D_I	DIOSPD	I_0/1	I
49	JTIO/P0[2]	D_IPU	DIOSPU	I-PU_0/1	I-PU
50	PCM_FSC1/P0[3]	D_I/O	DIOSPU	O_0/1	I-PU
51	PCM_FSC0/P0[4]	D_I/O	DIOSPU	O_0/1	I-PU
52	PCM_CLK/P0[5]	D_I/O	DIOSPU	O_0/1	I-PU
53	PCM_DOUT/P0[6]	D_I/O	DIOSPU/DIOD	O_0/1	I-PU
54	PCM_DIN/P0[7]	D_I/O	DIOSPU/DIOD	O_0/1	I-PU
55	VDDIO	-	-	-	-
56	VSS	-	-	-	-
57	DREQ0n/INT0n/P1[0]	D_I/O	DIOSPU	O_0	I-PU
58	DACK0n/INT1n/P1[1]	D_I	DIOSPU	I-PU_0/1	I-PU
59	ACS1/DREQ1n/INT2n/P1[2]	D_O	DIOSPU	O_0/1	I-PU
60	ACS0	D_O	DO	O_0/1	O-1

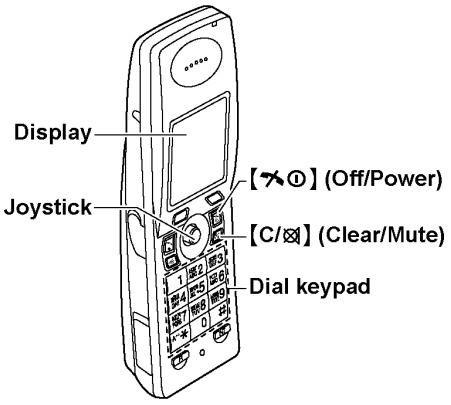
Pin No.	Description	I/O	Connection	at Normal mode	at Reset mode
61	ACS2/DACK1n/INT3n/P1[3]	D_O	DIOSPU	O_0/1	I-PU
62	HOLDn/INT4n/P1[4]	D_I	DIOSPU	I-PU_0/1	I-PU
63	VDDE/HOLDACKn/INT5n/P1[5]	D_I/O	DIOSPU	O_0	I-PU
64	BE1n	D_O	DIO	O_0/1	O-1
65	BE0n	D_O	DIO	O_0/1	O-1
66	SCL2/P3[0]	D_I	DIO	I_0/1	O-Hi-Z
67	SDA2	D_O	DIOD	O_0	I
68	DAB0	D_I/O	DIO	O/I_0/1	O-1
69	DAB8	D_I/O	DIO	O/I_0/1	O-1
70	DAB1	D_I/O	DIO	O/I_0/1	O-1
71	DAB9	D_I/O	DIO	O/I_0/1	O-1
72	DAB2	D_I/O	DIO	O/I_0/1	O-1
73	DAB10	D_I/O	DIO	O/I_0/1	O-1
74	DAB3	D_I/O	DIO	O/I_0/1	O-1
75	DAB11	D_I/O	DIO	O/I_0/1	O-1
76	VSS	-	-	-	-
77	VDD	-	-	-	-
78	VDDIO	-	-	-	-
79	P2[0]/PWM0/SPIDI	D_O	DIO	O_0/1	I
80	P2[1]/PWM1/SPICLK	D_I	DIO	I_0/1	I
81	P2[2]/ADC0/CLK100	D_O	DO	O_0/1	I
82	P2[3]/ADC1	D_O	DO	O_0/1	I
83	P2[4]/SCL1	D_I/O	DIO	O_0/1	I
84	P2[5]/SDA1	D_O	DIO/DIOD	O_0/1	I
85	DAB4	D_I/O	DIO	O/I_0/1	O-1
86	DAB12	D_I/O	DIO	O/I_0/1	O-1
87	DAB5	D_I/O	DIO	O/I_0/1	O-1
88	DAB13	D_I/O	DIO	O/I_0/1	O-1
89	DAB6	D_I/O	DIO	O/I_0/1	O-1
90	DAB14	D_I/O	DIO	O/I_0/1	O-1
91	DAB7	D_I/O	DIO	O/I_0/1	O-1
92	DAB15	D_I/O	DIO	O/I_0/1	O-1
93	P2[7]/DC_CTRL/SPIDO	A_O	A6(fixed 100k pull-down)	O_0/1	O-0
94	DC_I	A_I	A4	I	I
95	P1[6]/PON/INT6	A_I	A3	I	I-PD(160k pull down)
96	P1[7]/CHARTGE/INT7	A_I	A3	I	I-PD(160k pull down)
97	P2[6]/stop_charge	A_I	A4	I	O-0
98	VBAT3/RINGING	A_I	A3	I	I
99	DC_stab	A_I	A4	I	O
100	DC_Sense	A_I	A4	I	I
101	AVS_sense	A_I	A4	I	I
102	ADC3	A_I	AI	I	I
103	LDO1_Sense	A_I	A4	I	I
104	LDO1_CTRL	A_O	A4	O	O-1
105	LDO2_CTRL	A_O	A4	O	O-0
106	VBAT2	A_I	A4	I	I
107	VBAT1	A_I	A4	I	I
108	AVS2	-	-	-	-
109	AVD2	-	-	-	-
110	LSR+/REF	A_O	A1	O	O
111	LSR-/REF	A_O	A1	O	O
112	LSR_HS/CIDIN-	A_O	A1	O	O
113	VREF_HS/CIDOUT	A_O	A1	O_0/1	O
114	MIC-	A_I	A2	I	I
115	VREF-	O	A4	O	O
116	VBUF	O	A4	O	O
117	AGND	O	A4	O	O
118	MIC+	I	A2	I	I
119	VREF+/CIDIN+	I	A2	I	I
120	RSTn	I	A5	I	I-PU(80k pull up)
121	AD0/EXT_MEMORY	D_IPD	DIOPD	D_IPD	I_PD
122	AD1	D_O	DIO	O_0/1	O-0/1
123	AD2	D_O	DIO	O_0/1	O-0/1
124	AD3	D_O	DIO	O_0/1	O-0/1
125	AD4	D_O	DIO	O_0/1	O-0/1

Pin No.	Description	I/O	Connection	at Normal mode	at Reset mode
126	AD5	D_O	DIO	O_0/1	O-0/1
127	AD6	D_O	DIO	O_0/1	O-0/1
128	AD7	D_O	DIO	O_0/1	O-0/1

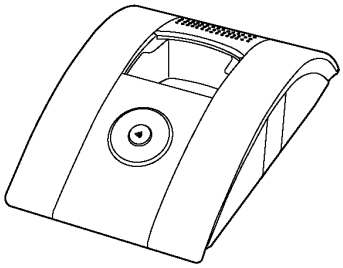
22 ENGINEERING MODE

22.1. Base Unit

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



H/S key operation

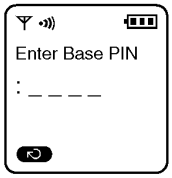


H/S LCD

1). Register a Handset to a Base Unit.

2). Press "▣" (centre of joystick) key, then select "Base Unit Setup" by joystick.

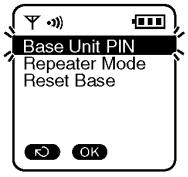
3). Press "OK" (centre of joystick).



4). Enter "0", "0", "0", "0".
Note: This 4 digits are default setting.

5). Select "Other Options", then Press "OK" (centre of joystick).

6). Select "Base Unit PIN".



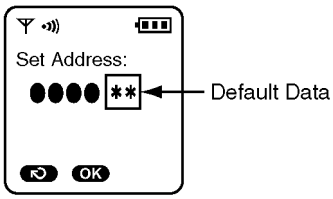
7). Press "OK" (centre of joystick).

8). Enter "7", "2", "6", "2", "7", "6", "6", "4", then press "OK" (centre of joystick).
Note: 7262 7664 = PANA SONI
(see alphabets printed on dial keys)

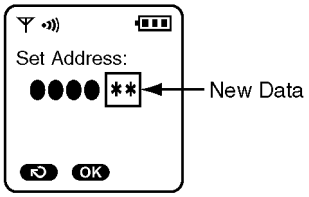
9). Select "Write EEPROM".

10). Press "OK" (centre of joystick).

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



12). Enter "＊", "＊" (New Data).



13). Press "OK" (centre of joystick).
A long confirmation beep will be heard.

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

ex.)

Items (*2)	**Address**	**Default Data**	**New Data**		**Remarks**
C-ID (FSK) sensitivity	04 6F	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 7D	50	60 (6dB up)	70 (12dB up)	When hex changes from “50” to “60” or “70”, 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)
PULSE Dial speed (10PPS -> 20PPS)	03 5C	28 (40msec) (*1)	14 (20msec)	-	This is pulse make time. (Unit:1ms)
	03 5D	3C (60msec) (*1)	1E (30msec)	-	This is pulse break time. (Unit:1ms)
	01 E4	57 (870msec) (*1)	2C (440msec)	-	This is inter-digit time in pulse mode. (Unit:10ms)

(*1)

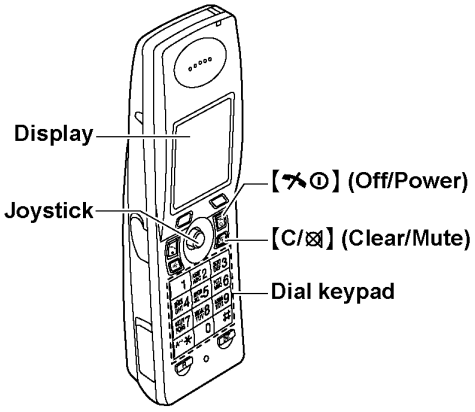
Bell length	32(hex) = 50(dec) → 50 × 100msec = 5000msec (5sec)
PULSE Dial speed (10PPS -> 20PPS)	28(hex) = 40(dec) → 40 × 1msec = 40msec
	3C(hex) = 60(dec) → 60 × 1msec = 60msec
	57(hex) = 87(dec) → 87 × 10msec = 870msec

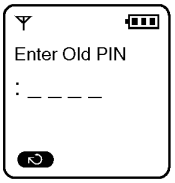
(*2)

Items	**Description**
C-ID (FSK) sensitivity	FSKGain_shiftgain
C-ID (DTMF) sensitivity	Foutgains:HPFilter Foutgains
Frequency	Setting value of FREQ_TRIM_REG
ID	ID
Bell length	Time until it stops bell.
PULSE Dial speed (10PPS -> 20PPS)	Pulse MakeTime and BreakTime. bMakeTime:Pulse MakeTime Unit: 1ms bBreakTime:Pulse Break Time Unit: 1ms
	Inter-digit time in Pulse mode. Unit:10ms

22.2. Handset

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

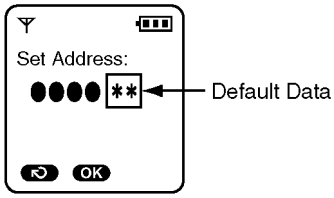


H/S key operation	H/S LCD
1). Press "▦" (centre of joystick) key, then select "Handset Setup" by joystick.	
2). Press "OK" (centre of joystick).	
3). Select "Other Options" by joystick, then Press "OK" (centre of jostick).	
4). Select "Handset PIN", then press "OK" (centre of jostick).	
5). Enter "0", "0", "0", "0". **Note:** This 4 digits are default setting.	
6). Enter "7", "2", "6", "2", "7", "6", "6", "4", then press "OK" (centre of joystick). **Note:** 7262 7664 = PANA SONI (see alphabets printed on dial keys)	

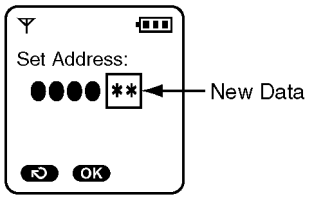
8). Select "Write EEPROM".

9). Press "OK" (centre of joystick).

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



11). Enter "*", "*" (New Data).



12). Press "OK" (centre of joystick).
A long confirmation beep will be heard.

13). Press "⏻" (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 in **Note:** of **ENGINEERING MODE** (P.59).

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 1.0dB.

ex.)

Item	Default Data	New Data	
	3A	3E	36
Sending level	-10.5dBm	-9.5dBm	-11.5dBm

(*2) When reducing “01” (hex) from default value, receiving level increases by 1.0dB.

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 handset.

(*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

23 EEPROM LAYOUT (BASE UNIT)

23.1. Scope

The purpose of this section is to describe the layout of the EEPROM (IC3) for the KX-TCD816 Base Unit.

The EEPROM contains hardware, software, and user specific parameters. Some parameters are set during production of the base unit, some are set by the user configuration, and some are set during normal use of the phone.

23.2. Introduction

The base unit uses a 32k bit serial EEPROM (IC3) for storing volatile parameters. All parameters are set up before the base unit leaves the factory. Some of these are vital for the operation of the hardware so a set of default parameters is programmed before the actual hardware fine-tuning can be initiated. This document lists all default settings with a short description.

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

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

23.3. EEPROM Layout

23.3.1. General Setup1

Address	Initial Type	Name	Description	Default value	Country Setting
0000	-	EEP_EepromType	**EEPROM type** 0x00:32kbit type 0x55:64kbit type 0xAA:128kbit type other:32kbit type	0x00	x
0007	F	EEP_ModelInfo	**Model information** Bit0:TAM...1:Enable, 0:Disable Bit1:Base Phonebook...1:Enable, 0:Disable Bit2:Audible Call...1:Enable, 0:Disable Bit3:SP-PHONE...1:Enable, 0:Disable Bit4:FAX...1:Enable, 0:Disable Bit5:TalkOver...1:Enable, 0:Disable Bit6-7:Not used	0x00	x
01E0	1	EEP_MenusEnabled	**Menus Enabled** Bit0:Menu of Select Dial Mode...1:Enable, 0:Disable Bit1:Flash Menu...1:Enable, 0:Disable Bit2-3:Don´t Used Bit4:Menu of Select Pause time...1:Enable, 0:Disable Bit5:Battery Type Bit6:Repeater Mode Bit7:Ringer Menu	0xDE	0xDF

23.3.2. General Setup2

Address	Initial Type	Name	Description	Default value	Country Setting
0001	F	EEP_FreqTrim_L	**Setting value of FREQ_TRIM_REG**	0x75	x
0002	F	EEP_BandGap	**Setting value of BandGap REG**	0x08	x
0010	-	EEP_Rfpi	**Base ID** written data by adjustment checker or ID writer RFPI (5Byte)	0xFF, 0xFF, 0xFF, 0xFF, 0xFF	x
0300	1	EEP_Rc0	**BMC internal Register 0**	0x40	x
0022	0	EEP_Ps0_InUseFlag	**IN-Use Flag** 00:Invalid / 01:Valid	0x00	x
0023	0	EEP_Ps0_DectPsNo	**DECT PS No.** 00-3F:PS No. / FF:Invalid	0xFF	x
0024	0	EEP_Ps0_PsType	**PS Type** 00:KME´s PS (Group Page) 01:KME´s PS (Group Page/Message Waiting) 02:TD-7500 or TD-7590 / FF:Another Maker´s PS	0xFF	x

Address	Initial Type	Name	Description	Default value	Country Setting
0025	0	EEP_Ps0_Ipui	**PS ID** first byte:0xA8 (Length Information) from second byte:IPUI (Normal:5byte, Max:13byte)	0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00	x
006A	0	EEP_Ps1_InUseFlag	**IN-Use Flag** 00:Invalid / 01:Valid	0x00	x
006B	0	EEP_Ps1_DectPsNo	**DECT PS No.** 00-3F:PS No. / FF:Invalid	0xFF	x
006C	0	EEP_Ps1_PsType	**PS Type** 00:KME´s PS (Group Page) / 01:KME´s PS (Group Page/Message Waiting) 02:TD-7500 or TD-7590 / FF:Another Maker´s PS	0xFF	x
006D	0	EEP_Ps1_Ipui	**PS ID** IPUI (14Byte)	0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00	x
00B2	0	EEP_Ps2_InUseFlag	**IN-Use Flag** 00:Invalid / 01:Valid	0x00	x
00B3	0	EEP_Ps2_DectPsNo	**DECT PS No.** 00-3F:PS No. / FF:Invalid	0xFF	x
00B4	0	EEP_Ps2_PsType	**PS Type** 00:KME´s PS (Group Page) / 01:KME´s PS (Group Page/Message Waiting) 02:TD-7500 or TD-7590 / FF:Another Maker´s PS	0xFF	x
00B5	0	EEP_Ps2_Ipui	**PS ID** IPUI (14Byte)	0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00	x
00FA	0	EEP_Ps3_InUseFlag	**IN-Use Flag** 00:Invalid / 01:Valid	0x00	x
00FB	0	EEP_Ps3_DectPsNo	**DECT PS No.** 00-3F:PS No. / FF:Invalid	0xFF	x
00FC	0	EEP_Ps3_PsType	**PS Type** 00:KME´s PS (Group Page) / 01:KME´s PS (Group Page/Message Waiting) 02:TD-7500 or TD-7590 / FF:Another Maker´s PS	0xFF	x
00FD	0	EEP_Ps3_Ipui	**PS ID** IPUI (14Byte)	0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00	x
0142	0	EEP_Ps4_InUseFlag	**IN-Use Flag** 00:Invalid / 01:Valid	0x00	x
0143	0	EEP_Ps4_DectPsNo	**DECT PS No.** 00-3F:PS No. / FF:Invalid	0xFF	x
0144	0	EEP_Ps4_PsType	**PS Type** 00:KME´s PS (Group Page) / 01:KME´s PS (Group Page/Message Waiting) 02:TD-7500 or TD-7590 / FF:Another Maker´s PS	0xFF	x
0145	0	EEP_Ps4_Ipui	**PS ID** IPUI (14Byte)	0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00	x
018A	0	EEP_Ps5_InUseFlag	**IN-Use Flag** 00:Invalid / 01:Valid	0x00	x
018B	0	EEP_Ps5_DectPsNo	**DECT PS No.** 00-3F:PS No. / FF:Invalid	0xFF	x
018C	0	EEP_Ps5_PsType	**PS Type** 00:KME´s PS (Group Page) / 01:KME´s PS (Group Page/Message Waiting) 02:TD-7500 or TD-7590 / FF:Another Maker´s PS	0xFF	x
018D	0	EEP_Ps5_Ipui	**PS ID** IPUI (14Byte)	0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00	x
0D51	3	EEP_System Password	**System Password**	0x00, 0x00	x

23.3.3. Flash Time Setting

Address	Initial Type	Name	Description	Default value	Country Setting
0365	1	EEP_FlashTime1	**Calibrated loop-break time for "80 ms"** Unit: 10 ms, defaults to 80 ms	0x08	x
0366	1	EEP_FlashTime2	**Calibrated loop-break time for "90 ms"** Unit: 10 ms, defaults to 90 ms	0x09	x
0367	1	EEP_FlashTime3	**Calibrated loop-break time for "100 ms"** Unit: 10 ms, defaults to 100 ms	0x0A	x

23.3.4. Clip (Caller ID) configuration

Address	Initial Type	Name	Description	Default value	Country Setting
0228	1	EEP_ClipDetectConfig	**CLIP detect configuration** Bit0-2:Mode...1:DTMF only, 2:FSK only, 3:FSK/DTMF both, 4:Russian CLIP Bit3:Onhook...1=enable, 0=disable Bit4:Offhook...1=enable, 0=disable Bit5:MsgWaiting...1=enable, 0=disable Bit6:KpnVmwi...1=enable, 0=disable Bit7:Unused	0x3B	0x3C
0229	1	EEP_FskInterdigitTimeout	**FSK Interdigit timeout** Unit: 10ms, Defalut: 80ms	0x08	x
022A	1	EEP_RuClipReqLev	**RCID REQ signal Level** Default: -4.3dBm	0x00, 0x13	0x60, 0x15
03B1	1	EEP_ClipRingConfig	**Ring configuration** Bit0:Rpas...1=enable, 0=disable Bit1:RpasAlert...1=enable, 0=disable Bit2:Rpas2LongAlert...1=enable, 0=disable Bit3:Suppress1stRing...1=enable, 0=disable Bit4:Check1stRing...1=enable, 0=disable Bit5:RingEarlier...1=enable, 0=disable Bit6-7:Unused	0x20	x
03B2	1	EEP_ImpSetConfig	**Impedance Set configuration** Bit0:Polarity...1=enable, 0=disable Bit1:Dtas...1=enable, 0=disable Bit2:Rpas...1=enable, 0=disable Bit3:PowerRing...1=enable, 0=disable Bit4:LearnImpPattern...1=enable, 0=disable Bit5:CheckPolStatus...1=enable, 0=disable Bit6-7: Unused	0x15	x
03B3	1	EEP_ImpRemConfig	**Impedance Remove configuration** Bit0:Polarity...1=enable, 0=disable Bit1:Ringing...1=enable, 0=disable Bit2:ClipReceived...1=enable, 0=disable Bit3:Offhook...1=enable, 0=disable Bit4:ChszDet...1=enable, 0=disable Bit5-7:Unused	0x0F	x
03B4	1	EEP_CasAckDtmf	**CAS Acknowledge DTMF tone** 00:DTMF 0 - 09:DTMF 9 0A:DTMF A 0B:DTMF B 0C:DTMF C 0D:DTMF D 0E:DTMF ✳ 0F:DTMF #	0x0D	x
03B5	1	EEP_DtmfReceiveDataCount	**Valid Receive data Count (for INDIA)**	0x04	x
03B6	1	EEP_ClipPhaseConfig	**CLIP phase set configuration** Bit0:ForwardNumber...1=enable, 0=disable Bit1:CallingNumber...1=enable, 0=disable Bit2:Dutch...1=enable, 0=disable Bit3:Chinese...1=enable, 0=disable Bit4:PriorityCheck...1=enable, 0=disable (for France) Bit5-6:AddZero...0:no add zero, 1:add zero absolutely 2:Check Number's top is zero. If it is zero, add zero. Bit7:TwDtmf...1=enable, 0=disable Bit8:FskRemoveParity...1=enable, 0=disable Bit9:AutoRappel...1=enable, 0=disable Bit10:KpnStartEndNg Bit11:CheckCidSendFlg Bit12:If DTMF CLIP come in series, 0:First data is available, 1:Last data is available Bit13-15:Unused	0x01, 0x04	x

Address	Initial Type	Name	Description	Default value	Country Setting
03B8	1	EEP_AddZeroDataCount	**Valid data for Add Zero (for NewZealand)**	0x05	x
03B9	1	EEP_KpnVmwiConfig	**CLIP RingVmwi set configuration** Bit0:LongBellFuncOff...1=enable, 0=disable Bit1:StatusSucceed...1=enable, 0=disable Bit2-7:Unused	0x01	x
03BA	1	EEP_RpasMinDuration	**RPAS minimum duration** Unit: 10ms, Default: 180ms	0x12	x
03BB	1	EEP_RpasMaxDuration	**RPAS maximum duration** Unit: 10ms, Default: 320ms	0x20	x
03BC	1	EEP_DtasDataTimeout	**DTAS to FSK data timeout** Unit: 100ms, Default: 1s	0x0A	x
03BD	1	EEP_ImpSetTimeout	**Impedance Set timeout (RPAS for France)** Unit: 10ms, Default: 250ms [Standard: 200-350ms]	0x14	x
03BE	1	EEP_ImpRemRpasTimeout	**Impedance Remove timeout (RPAS)** Unit: 10ms, Default: 1250ms [Standard: 1450ms (subtract Impedance Set timeout)]	0x7D	x
03BF	1	EEP_ImpRemChszTimeout	**Impedance Remove timeout (Channel Seizure)** Unit: 10ms, Default: 450ms [Standard: 420-570ms]	0x2D	x
03C0	1	EEP_ImpRemContTimeout	**Impedance Remove timeout** Unit: 100ms, Default: 1s	0x0A	x
03C1	1	EEP_CasAckDelayTimeout	**CAS to Acknowledge DTMF Delay Timeout** Unit: 1ms, Default: 0ms	0x00	x
03C2	1	EEP_CasAckDuration	**Acknowledge DTMF tone duration** Unit: 1ms, Default: 70ms	0x46	x
03C3	1	EEP_CasAckDataTimeout	**CAS to FSK data timeout** Unit: 10ms, Default: 600ms	0x64	x
03C4	1	EEP_FskMarkoutTimeout	**FSK Markout timeout after FSK received** Unit: 10ms, Default: 100ms	0x0A	x
03C5	1	EEP_DtmfInterdigitTimeout	**DTMF Interdigit timeout** Unit: 10ms, Default: 500ms	0x32	x
03C6	1	EEP_DtmfMuteTimeout	**Mute timeout when OFFHOOK CLIP received (for DK)** Unit: 100ms, Default: 5s	0x32	x
03C7	1	EEP_DtmfBellWaitTimeout	**Bell Wait timeout** Unit: 100ms, Default: 10s	0x6E	x
03C8	1	EEP_RingVmwiMinDuration	**Bell Ring minimum duration (for KPN VoiceMail)** Unit: 1s, Default: 14s	0x0E	x
03C9	1	EEP_RingVmwiMaxDuration	**Bell Ring maximum duration (for KPN VoiceMail)** Unit: 1s, Default: 22s	0x16	x
03CA	1	EEP_RingPulseMin	**Bell Ring on minimum duration (for KPN VoiceMail)** Unit: 10ms, Default: 600ms	0x3C	x
03CB	1	EEP_VmwiRingInterdigitMax	**Bell Ring Interdigit maximum (for KPN VoiceMail)** Unit: 100ms, Default: 5000ms	0x32	x
03CC	1	EEP_RuConfig	**Russian CLIP Configuration** Bit0:Unused Bit1:RuClipMode...1=Auto, 0=Manual Bit2:RuClipRbtOnOff...1=on, 0=off Bit3:CategoryNo.Display...1=on (T/A), 0=off (MP) Bit4-7:Unused	0x00	x
03CD	1	EEP_RuClipBackTraceTimeout	**Back Trace Start Timeout** Unit: 10ms, Default: 600ms	0x3C	x
03CE	1	EEP_RuRcvDigitBeforeReq	**Receive Digit Before REQ** Default: 2digit	0x02	x
03CF	1	EEP_PseudoBellLength	**Pseudo Bell/RBT Length** Unit: 10ms, Default: 800ms	0x50	x
03D0	1	EEP_PseudeBellToRbtLen	**Pseudo Bell to RBT/RBT to Pesude Bell Length** Unit: 100ms, Default: 1200ms	0x0C	x
03D1	1	EEP_PseudoBellEndTimeout	**Pseudo Bell End Timeout** Unit: 1s, Default: 120s	0x78	x
03D2	1	EEP_DtasMinDuration	**DTAS minimum duration** Unit: 10ms, Default: 60ms	0x06	x
03D3	1	EEP_DtasMaxDuration	**DTAS maximum duration** Unit: 10ms, Default: 130ms	0x0D	x

Address	Initial Type	Name	Description	Default value	Country Setting
03D4	1	EEP_CasMinDuration	**CAS minimum duration** Unit: 10ms, Default: 60ms	0x06	x
03D5	1	EEP_CasMaxDuration	**CAS maximum duration** Unit: 10ms, Default: 130ms	0x0D	x
03D6	1	EEP_DtmfMinDuration	**DTMF minimum duration** Unit: 10ms, Default: 20ms	0x02	x
03D7	1	EEP_DtmfMaxDuration	**DTMF maximum duration** Unit: 10ms, Default: disable(0xFF)	0xFF	x
03D8	1	EEP_RuDtmfDurationMin	**RU_DTMF minimum duration** Unit: 10ms, Default: 10ms	0x01	x
03D9	1	EEP_RuDtmfDurationMax	**RU_DTMF maximaum duration** Unit: 10ms, Default: 70ms	0x07	x
03DA	1	EEP_RuDtmfDurationOff	**RU_DTMF Off duration** Unit: 10ms, Default: 50ms	0x05	x
0D4B	3	EEP_RuClipReqLength	**Length of REQ signal** Unit: 10ms, Default: 140ms	0x0E	x
0D4C	3	EEP_RuClipDelayBetweenReq	**Delay between REQ signal** Unit: 10ms, Default: 200ms	0x14	x
0D4D	3	EEP_RuClipRepeatReq	**Number of repeat REQ request Sent** Default: 3 repeat	0x03	x
0D4E	3	EEP_RuClipDelayBeforeReq	**Delay before Send REQ signal** Unit: 10ms, Default: 200ms	0x14	x
0D4F	3	EEP_RuClipOnOff	**Russian CLIP On/Off**	0x01	x
0D50	3	EEP_RuClipRingNumBeforeSequence	**Number Of Rings Patterns Before Start Sequence** Default: 1	0x01	x
0D7B	3	EEP_RuClipDisplayDigit	**Number Of digits to be displayed** Default:7 digits	0x07	x

24 FLASH LAYOUT (HANDSET)

24.1. Scope

The purpose of this section is to describe the layout of the FLASH (IC11) for the KX-TCA181 Handset.

The FLASH contains hardware, software, and user specific parameters. Some parameters are set during production of the handset, some are set by the user when configuring the handset, and some during normal use of the phone.

24.2. Introduction

The handset uses a 32k bit serial FLASH (IC11) for storing volatile parameters. All parameters are set up before the handset the factory. Some of these are vital for the operation of the hardware so a set of default parameters is programmed before the actual hardware fine-tuning can be initiated. This document lists all default settings with a short description.

This document lists all default parameters with a short description.

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

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

24.3. FLASH contents

24.3.1. General Setup

Address	Initial Type	Name	Description	Default value	Country Setting
0001	F	EEP_FreqTrim_L	**Setting value of FREQ_TRIM_REG**	0x75	x
0002	F	EEP_BandGap	**Setting value of BandGap REG**	0x08	x
0010	-	EEP_Ipei	**International Portable Part Equipment Identities.** A concatenation of an EMC and a unique 20 bit Serial Number.	0x00, 0x00, 0x00, 0x00, 0x00	x
01C2	1	EEP_LowQualityLevel	**Signal quality level at which handover is initiated (CRC error count).**	0x02	x
01C9	1	EEP_RxMuteSyncError	**Continuous SYNC error times for the Rx Mute (0-0xFF: Error times)**	0x01	x
001D	0	EEP_HandsetNumber	HandsetNumber of Subscription0.	0xFF, 0xFF	x
001F	0	EEP_HandsetNumber1	HandsetNumber of Subscription1.	0xFF, 0xFF	x
0021	0	EEP_HandsetNumber2	HandsetNumber of Subscription2.	0xFF, 0xFF	x
0023	0	EEP_HandsetNumber3	HandsetNumber of Subscription3.	0xFF, 0xFF	x
0025	0	EEP_Subscription0	**GAP Subscription Data. Storage for 4 subscriptions each with 53bytes.** <Subscription> 020 : SUB_boAssignedIPUI 021 : SUB_abIPUI[14] 02F : SUB_abPARK[5] 034 : SUB_abSARI[4] 038 : SUB_bPLI 039 : SUB_bLAL 03A : SUB_abARIplusRPN[5] 03F : SUB_boZAP 040 : SUB_bZAP 041 : SUB_boServiceClass 042 : SUB_bServiceClass 043 : AK_boUAKavailable 044 : AK_boUAKproven 045 : AK_abUAK_or_AC [16]	All 0x00	x
03EF	3	EEP_HSPinCode	**Handset Pin : 4 BCD Digits**	0x00, 0x00	x

24.3.2. MMI Setting

Address	Initial Type	Name	Description	Default value	Country Setting
01DC	1	EEP_FactoryLanguageSetting	**Selected Language for LCD** GERAM:0 ENGLISH:1 SPANISH:2 NORWEGIAN:3 FRENCH:4 ITALIAN:5 DENISH:6 DUTCH:7 SWEDISH:8 FINNISH:9 GREEK:10 TURKISH:11 HUNGARIAN:12 PORTUGUESE:13 RUSSIAN:14 POLISH:15 SLOVAKIAN:16 CZECH:17 CROATIAN:18 CATALAN:19	0x01	0x14
01DD	1	EEP_Available_Language	**Select Available Language** 0:Disable, 1:Enable Bit0:German Bit1:English Bit2:Spanish Bit3:Norwegian Bit4:French Bit5:Italian Bit6:Danish Bit7:Dutch	0xFF	0x17
01DE			**Select Available Language** 0:Disable, 1:Enable Bit0:Swedish Bit1:Finnish Bit2:Greek Bit3:Turkish Bit4:Hungarian Bit5:Portuguese Bit6:Russian Bit7:Polish	0x2F	0x40
01DF			**Select Available Language** 0:Disable, 1:Enable Bit0:Slovakian Bit1:Czechs Bit2:Croatian Bit3:Catalan Bit4:Ukrinian Bit5:Spanish for Mexico Bit6:Slovenian Bit7:Estonian	0x08	0x10
01E0			**Select Available Language** 0:Disable, 1:Enable Bit0:Lithuanian Bit1:Latvian Bit2:Romanian Bit3:Bulgarian Bit4:Seribian Bit5:Macedonian Bit6:Albanian Bit7:Reserve	0x00	x
0414	3	EEP_Language	**User_Setting Language** GERAM:0 ENGLISH:1 SPANISH:2 NORWEGIAN:3 FRENCH:4 ITALIAN:5 DENISH:6 DUTCH:7 SWEDISH:8 FINNISH:9 GREEK:10 TURKISH:11 HUNGARIAN:12 PORTUGUESE:13 RUSSIAN:14 POLISH:15 SLOVAKIAN:16 CZECH:17 CROATIAN:18 CATALAN:19	0x01	0x14
0415	3	EEP_SmsEatoniLanguage	**Eatoni Setting Language** GERAM:0 ENGLISH:1 SPANISH:2 NORWEGIAN:3 FRENCH:4 ITALIAN:5 DENISH:6 DUTCH:7 SWEDISH:8 FINNISH:9 GREEK:10 TURKISH:11 HUNGARIAN:12 PORTUGUESE:13 RUSSIAN:14 POLISH:15 SLOVAKIAN:16 CZECH:17 CROATIAN:18 CATALAN:19	0x01	0x14

Address	Initial Type	Name	Description	Default value	Country Setting
0362	1	EEP_CountryFunction	**Country parameter** 0bit: Reset Ear-SP Vol. after Talk...0: Hold, 1: Reset 1bit: PBX Phone-Book...0: Enable, 1: Disable 2bit: Ringer Option Menu (Base Setting)...0: Off, 1: On 3bit: SMS Print...0: Off, 1: On 4-7bit: Reserve	0x02	x

24.3.3. MMI1 Setting

Address	Initial Type	Name	Description	Default value	Country Setting
0102	1	EEP_DspSdtLevel	**DSP Parameter SideTone2** Main:SideTone2 Main route level MictoRcv:SideTone2 MIc to Receiver level	0x00, 0x0E	x
0104	1	EEP_DspToneLevel	**DSP Parameter ToneLevel** Talk:Tone Level in Talk mode Spp:Tone Level in Spp mode	0x00, 0x20, 0x00, 0x30	x
000E	F	EEP_LcdContrast	**LCD contrast**	0x20	x
01A4	1	EEP_CountryFunction01	**Country parameter** Bit0:Call waiting Tone on/off...1:on, 0:off Bit1:Clock Back Up...1:on, 0:off Bit2:Charge ON Tone...1:Tone on, 0:KeyTone operating Bit3:BackUpTime revise...1:on, 0:off Bit4:On Charge Partial...1:none, 0:Partial Display Bit5:Start Talk Count Delay on/off...1:on, 0:off Bit6:Russian Model 1: Russian Model 0: Not Russian Model Bit7:Reserve	0x3E	0x7E
01A7	3	EEP_EEToneConfig	**Tone Option Data** Bit0:Keytone on/off00 - 0000 = Off / 0001 = Tone On Bit1:Keytone on/off01 - Reserve Bit2:Keytone on/off02 - Reserve Bit3:Keytone on/off03 - Reserve Bit4:Call waiting on/off - 1/0 Bit5:Range alarm on/off - 1/0 Bit6:Battery low alarm on/off - 1/0	0x51	x

24.3.4. Battery Paramters

Address	Initial Type	Name	Description	Default value	Country Setting
0004	F	EEP_LowVoltage	**ADC value for battery low detection**	0x25	x
0005	F	EEP_NoVoltage	**ADC value for shutdown voltage**	0x08	x

25 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.

25.1. 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)

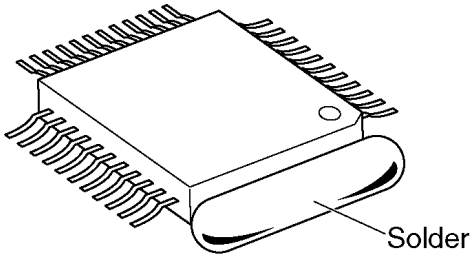
  Note: See **ABOUT LEAD FREE SOLDER (PbF: Pb free)** (P.4).

25.2. FLAT PACKAGE IC REMOVAL PROCEDURE

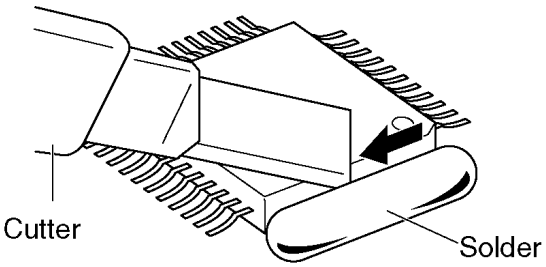
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

   Note:

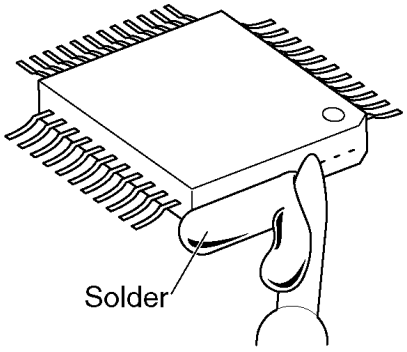
   If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



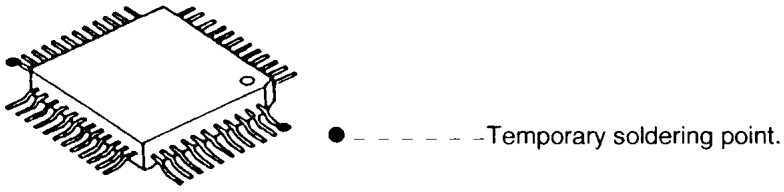
3. While the solder melts, remove it together with the IC pins.



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.

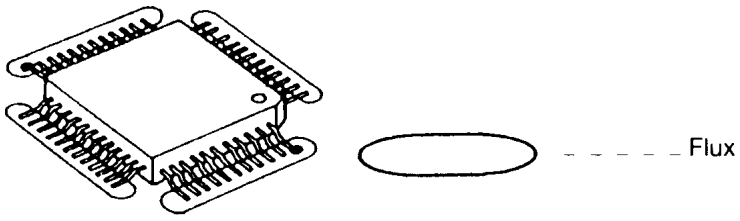
25.3. FLAT PACKAGE IC INSTALLATION PROCEDURE

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

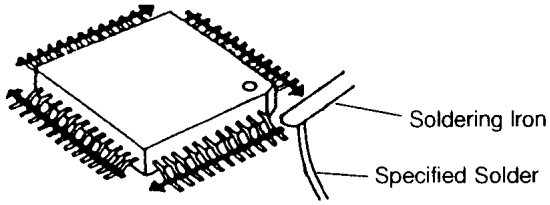


*Check the accuracy of the IC setting with the corresponding soldering foil.

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

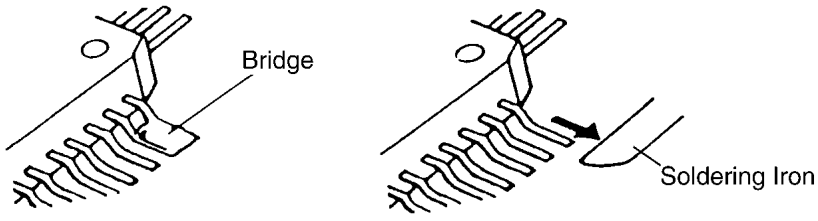


3. Solder the pins, sliding the soldering iron in the direction of the arrow.

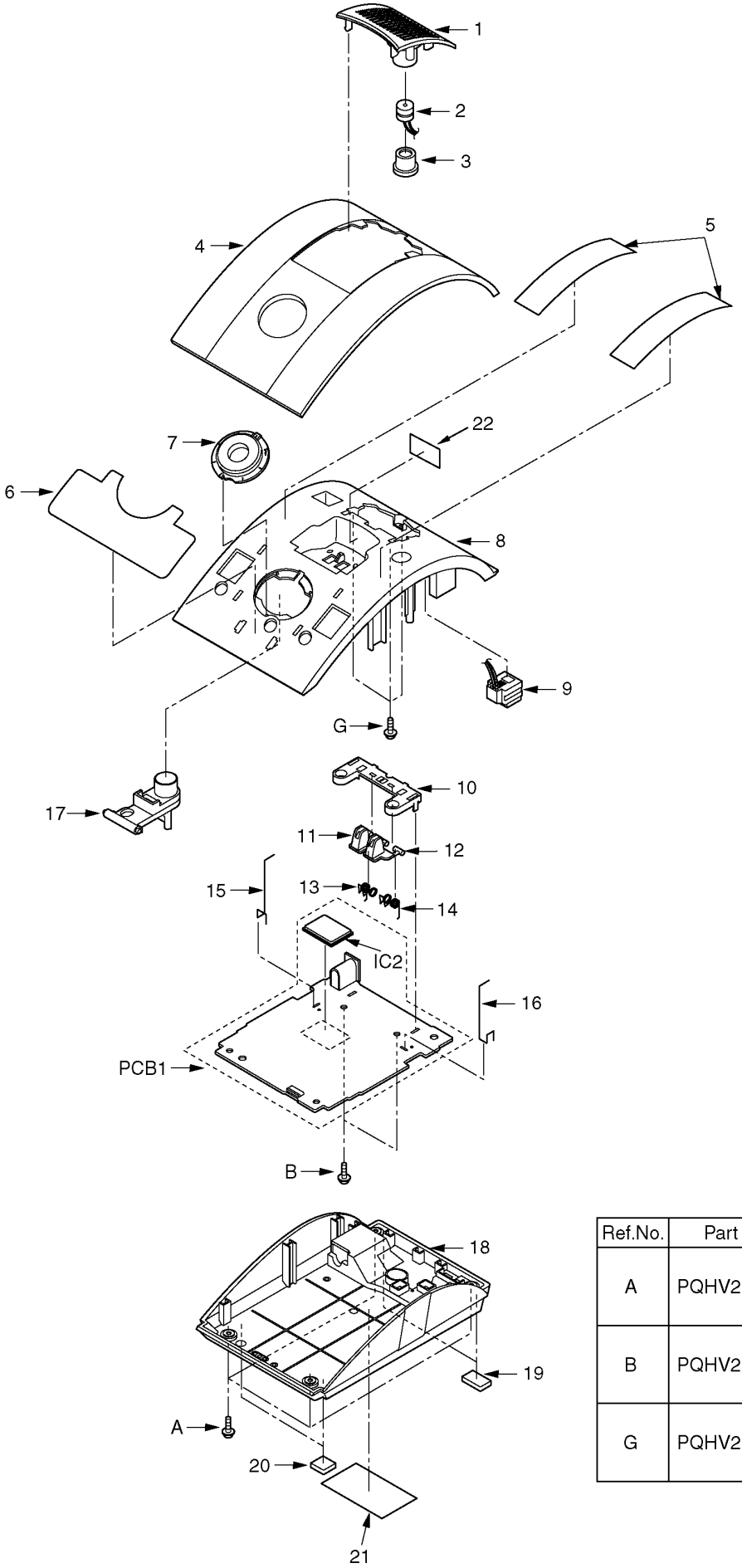


25.4. BRIDGE MODIFICATION PROCEDURE

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

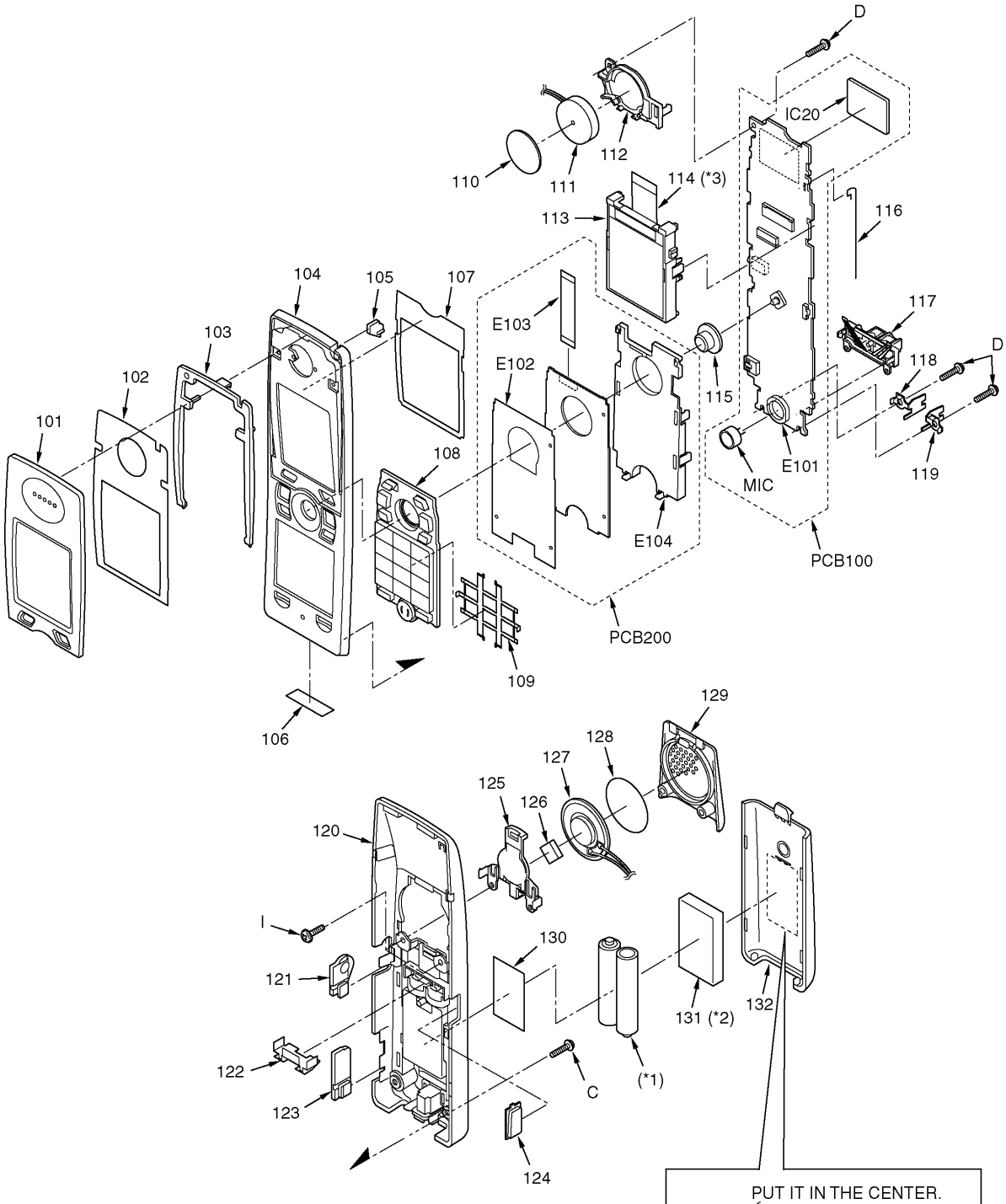


26 CABINET AND ELECTRICAL PARTS (BASE UNIT)



Ref.No.	Part No.	Figure
A	PQHV2612PJ65	ϕ2.6 × 12mm
B	PQHV2610PJ65	ϕ2.6 × 10mm
G	PQHV2610PJ65	ϕ2.6 × 10mm

27 CABINET AND ELECTRICAL PARTS (HANDSET)



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

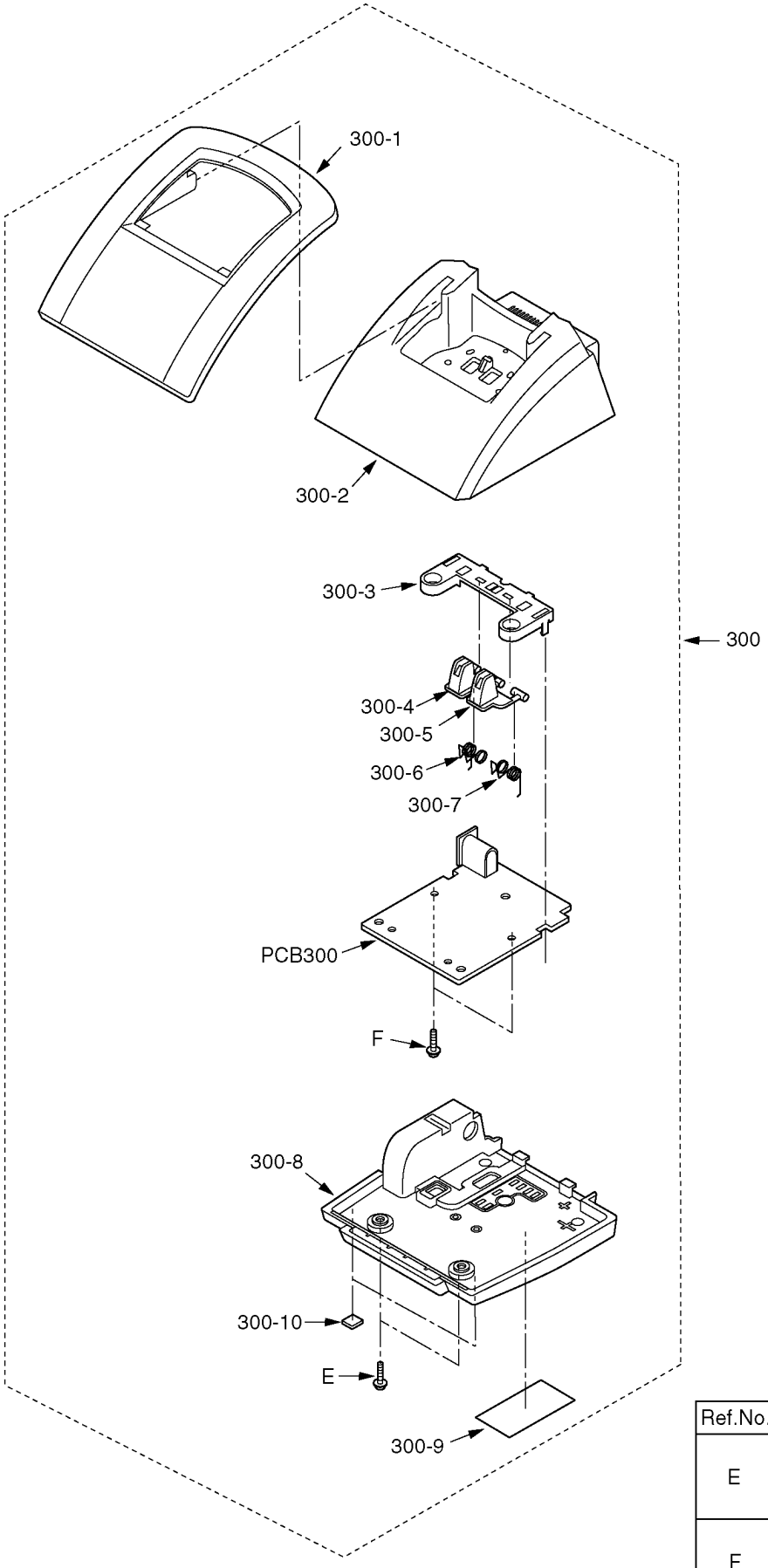
Note:

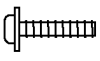
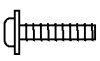
(*1) The rechargeable Ni-MH battery P03P (HHR-4EPT) is available through sales route of Panasonic.

(*2) Attach the spacer (No. 131) to the exact location described above.

(*3) This cable is fixed by connector lock. Refer to **Fix the LCD to the Main P.C.Board (Handset)** (P.16).

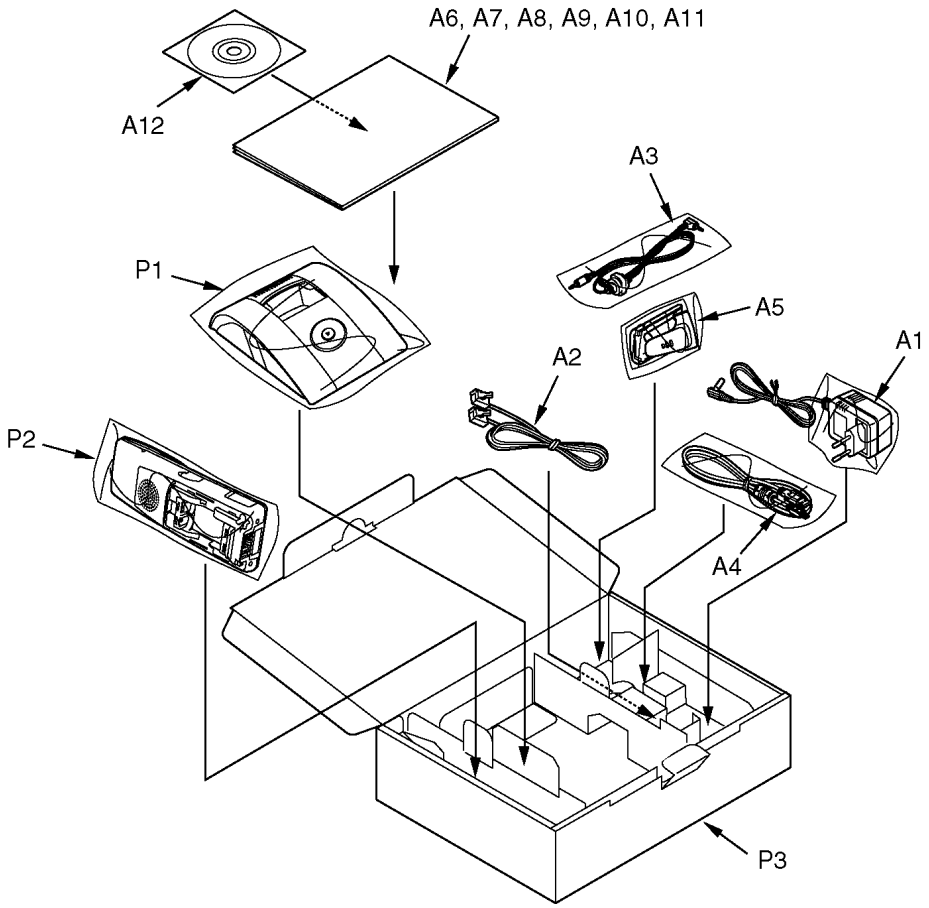
28 CABINET AND ELECTRICAL PARTS (CHARGER UNIT)



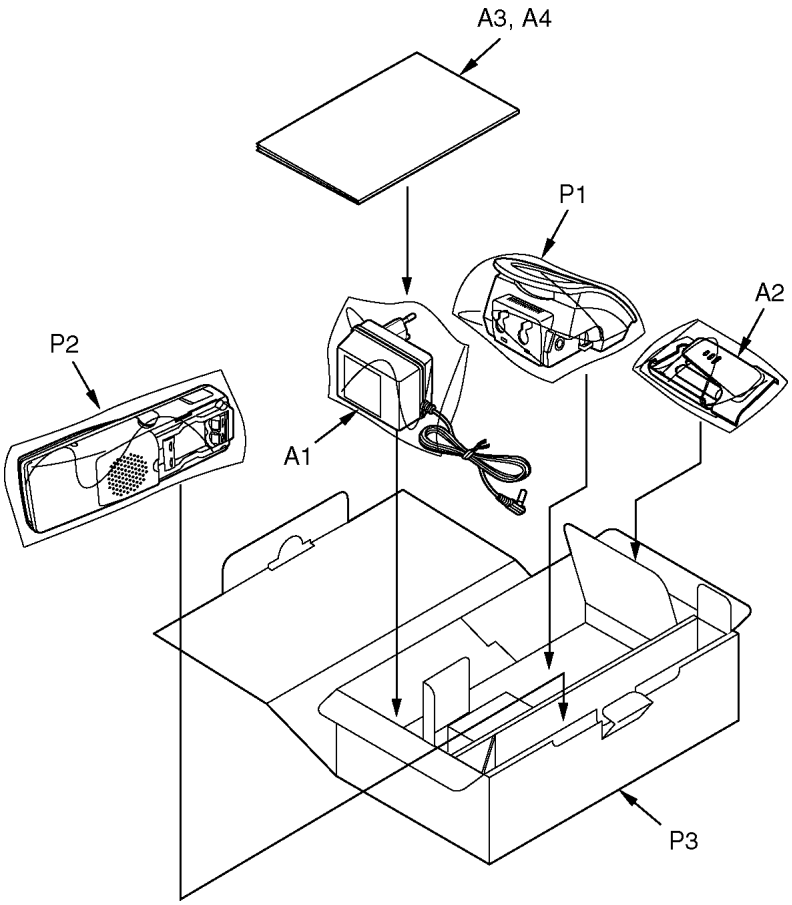
Ref.No.	Part No.	Figure
E	PQHV2610PJ65	 ϕ2.6 × 10mm
F	PQHV2610PJ65	 ϕ2.6 × 10mm

29 ACCESSORIES AND PACKING MATERIALS

29.1. KX-TCD816UAS/UAT



29.2. KX-TCA181UAS/UAT



30 TERMINAL GUIDE OF THE ICs, TRANSISTORS AND DIODES

30.1. Base Unit

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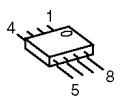
<td> 

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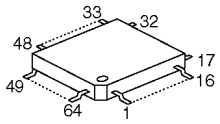
<td> 

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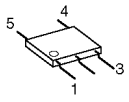
<td> 

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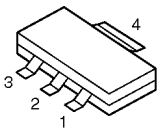
<td> 

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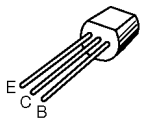
<td> 

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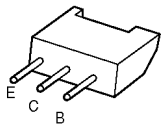
<td> 

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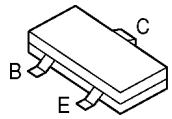
<td colspan="2"> 

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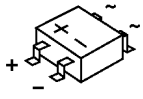
<td> 
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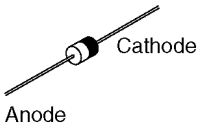
<td> 

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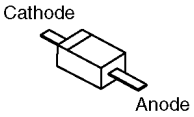
<td> 

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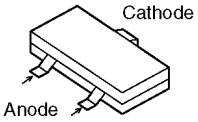
<td> 

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30.2. Handset

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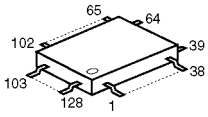
<td> 

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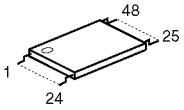
<td> 

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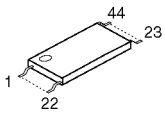
<td> 

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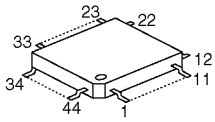
<td colspan="2"> 

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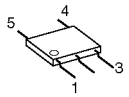
<td> 

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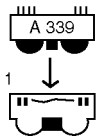
<td> 

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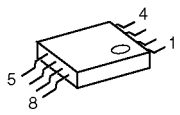
<td> 

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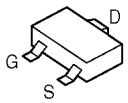
<td> 

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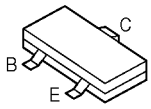
<td> 

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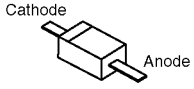
<td colspan="2"> 

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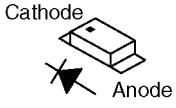
<td> 

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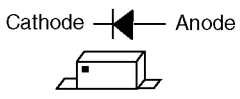
<td> 

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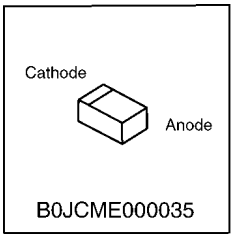
30.3. Charger Unit



31 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

31.1. Base Unit

31.1.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQGG10302Z2	GRILLE, BUZZER (for KX-TCD816UAS)	ABS-HB
1	PQGG10302Z3	GRILLE, BUZZER (for KX-TCD816UAT)	ABS-HB
2	L0DACD000004	BUZZER	
3	PQHG10690Z	RUBBER PARTS, BUZZER	
4	PQGG10300Z2	GRILLE (for KX-TCD816UAS)	ABS-HB
4	PQGG10300Z4	GRILLE (for KX-TCD816UAT)	ABS-HB
5	PQHS10682Z	TAPE, DOUBLE SIDED (SIDE)	
6	PQHS10678Z	TAPE, DOUBLE SIDED (FRONT)	
7	PQGG10301Z1	GRILLE, LOCATOR (for KX-TCD816UAS)	ABS-HB
7	PQGG10301Z2	GRILLE, LOCATOR (for KX-TCD816UAT)	ABS-HB
8	PQKM10687Y1	CABINET BODY	ABS-HB
9	PQJJ1T029Y	JACK SOCKET	
10	PQHR11132Z	CASE, CHARGE TERMINAL	PS-HB
11	PQKE10401Z1	HOLDER, CHARGE TERMINAL (L)	POM-HB
12	PQKE10402Z1	HOLDER, CHARGE TERMINAL (R)	POM-HB
13	PQJT10227Z	CHARGE TERMINAL (L)	
14	PQJT10228Z	CHARGE TERMINAL (R)	
15	PQSA10163Z	ANTENNA (L)	
16	PQSA10166Z	ANTENNA (R)	
17	PQBC10436Z1	BUTTON, LOCATOR (for KX-TCD816UAS)	ABS-HB
17	PQBC10436Z2	BUTTON, LOCATOR (for KX-TCD816UAT)	ABS-HB
18	PQKF10677Z2	CABINET COVER (for KX-TCD816UAS)	PS-HB
18	PQKF10677Y3	CABINET COVER (for KX-TCD816UAT)	PS-HB
19	PQHA10029Z	RUBBER PARTS, LEG CUSHION	
20	PQHA10018Z	RUBBER PARTS, FOOT CUSHION	
21	PQGT18307Z	NAME PLATE (for KX-TCD816UAS)	
21	PQGT18307X	NAME PLATE (for KX-TCD816UAT)	
22	PQQT23028Z	ATTENTION LABEL	

31.1.2. Main P.C.Board Parts

Note:

(*1) When replacing IC3 and IC8, data need to be written to it with PQZZTCD816UA. Refer to **Base Unit** (P.42) of **THINGS TO DO AFTER REPLACING IC**.

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWPCD806UAH	MAIN P.C.BOARD ASS´Y (RTL)	
		(ICs)	
IC1	C0CBAYF00015	IC	
IC3	PQWID300NEHR	IC (EEPROM) (*1)	
IC8	C1CB00002047	IC (BBIC) (*1)	S
IC11	C0JBAS000249	IC	
IC12	C0JBAS000249	IC	
		(TRANSISTORS)	
Q2	B1ADGE000004	TRANSISTOR(SI)	
Q3	B1ADGE000004	TRANSISTOR(SI)	
Q4	B1ACGP000007	TRANSISTOR(SI)	
Q5	PQVTBF822T7	TRANSISTOR(SI)	
Q6	B1ADGE000004	TRANSISTOR(SI)	
Q8	2SD1994A	TRANSISTOR(SI)	
Q12	B1ABCE000009	TRANSISTOR(SI)	
Q15	B1ABGE000006	TRANSISTOR(SI)	
Q16	B1ABCF000103	TRANSISTOR(SI)	
Q90	B1ADCF000040	TRANSISTOR(SI)	
		(DIODES)	
D1	B0JAME000095	DIODE(SI)	
D3	B0EDER000009	DIODE(SI)	
D4	MA1Z300	DIODE(SI)	S
D6	MA8220	DIODE(SI)	S
D13	1SS355	DIODE(SI)	S
D16	1SS355	DIODE(SI)	S
D20	MA112	DIODE(SI)	S
DA1	B0DDCM000001	DIODE(SI)	
		(COILS)	
L3	PQLQR2M33NKT	COIL	S
L6	PQLQXF330K	COIL	S
L7	PQLQXF330K	COIL	S
L8	MQLRER10JFA	COIL	
L10	PQLQR2M4N7K	COIL	S
L11	PQLQR2M15NKT	COIL	S

Ref. No.	Part No.	Part Name & Description	Remarks
L12	ELJRF8N2JFB	COIL	
L15	MQLRER10JFA	COIL	
L16	MQLRER10JFA	COIL	
		(JACK)	
CN1	PQJJ1B4Y	JACK	S
		(VARISTOR)	
SA1	J0LF00000026	VARISTOR (SURGE ABSORBER)	
		(RESISTORS)	
R4	ERJ1WYJ180U	18	
R5	ERJ1WYJ180U	18	
R8	ERJ2RKF1200	0.12K	
R9	ERJ2RKF2000	0.2K	
R16	ERJ3GEYJ105	1M	
R17	ERJ3GEYJ105	1M	
R22	ERJ2GEJ104	100K	
R23	ERJ3GEYJ104	100K	
R24	ERJ3GEYJ101	100	
R25	PQ4R10XJ272	2.7K	S
R26	ERJ3GEYJ103	10K	
R27	ERJ2GEJ104	100K	
R28	ERJ3GEYJ222	2.2K	
R32	ERJ3GEYJ101	100	
R37	ERJ6GEY0R00	0	
R38	ERJ2GEJ154	150K	
R39	ERJ3GEYJ180	18	
R40	ERJ3GEYJ335	3.3M	
R42	ERJ3GEYJ273	27K	
R43	ERJ3GEYJ822	8.2K	
R44	ERJ3GEYJ222	2.2K	
R45	ERJ12YJ120	12	
R46	ERJ12YJ270	27	
R47	ERJ3GEYJ104	100K	
R48	ERJ3GEYJ473	47K	
R49	ERJ3GEYJ560	56	
R50	ECUV1H100DCV	10P	
R51	ERJ3GEY0R00	0	
R52	ERJ3GEYJ471	470	
R54	ERJ3GEYJ821	820	
R55	ERJ2GEJ102	1K	
R56	ERJ2GEJ222	2.2K	
R57	ERJ3GEYJ222	2.2K	
R64	ERJ3GEYJ102	1K	
R69	ERJ3GEYJ104	100K	
R70	ERJ3GEYJ104	100K	
R71	ERJ3GEYJ104	100K	
R72	ERJ3GEYJ474	470K	
R78	ERJ3GEYJ103	10K	
R79	ERJ3GEYJ681	680	
R80	PQ4R18XJ100	10	S
R81	ERJ8GEYJ123	12K	
R84	ERJ3GEYJ101	100	
R85	ERJ2GEJ332	3.3K	
R86	ERJ2GEJ102	1K	
R87	ERJ2GEJ103	10K	
R88	ERJ2GEJ103	10K	
R90	ERJ3GEYJ392	3.9K	
R91	ERJ2GEJ682	6.8K	
R92	ERJ2GEJ222	2.2K	
R93	ERJ2GEJ102	1K	
R94	ERJ2GEJ223	22K	
R105	ERJ2GEJ103	10K	
R106	ERJ3GEYJ184	180K	
R107	ERJ3GEYJ184	180K	
R115	ERJ3GEYJ222	2.2K	
R116	PQ4R10XJ471	470	S
R117	ERJ2GEJ102	1K	
R118	ERJ3GEYJ181	180	
R119	ERJ3GEYJ271	270	
R124	ERJ2GE0R00	0	
R125	ERJ2GE0R00	0	
R127	ERJ2GEJ101	100	
R132	ERJ2GEJ103	10K	
R134	ERJ3GEYJ102	1K	

Ref. No.	Part No.	Part Name & Description	Remarks
R135	ERJ3GEYJ103	10K	
R138	ERJ8GEYJ270	27	
R139	ERJ2GEJ471	470	
R140	ERJ2GEJ102	1K	
R141	ERJ2GEJ153	15K	
R142	ERJ3GEYJ122	1.2K	
R147	ERJ3GEYJ181	180	
R161	ERJ2GEJ150	15	
C167	PQ4R10XJ180	18	S
D14	ERJ8GEY0R00	0	
D15	ERJ8GEY0R00	0	
J10	ERJ3GEY0R00	0	
L4	ERJ3GEY0R00	0	
L14	ERJ2GEJ121	120	
		(CAPACITORS)	
C2	ECEA1CK101	100	S
C3	ECEA0JU331	330	
C4	ECEA1CKS100	10	
C5	ECEA1CKA100	10	
C7	ECUV1A105KBV	1	
C9	PQCUV1A225KB	2.2	
C11	ECUV1A105KBV	1	
C12	F1B2H152A048	1500P	
C13	F1B2H152A048	1500P	
C14	ECKD2H681KB	680P	S
C15	ECKD2H681KB	680P	S
C17	ECUE1H221KBQ	220P	
C22	ECUE1H221KBQ	220P	
C24	ECUV1C104KBV	0.1	
C26	ECUE1H102KBQ	0.001	S
C27	ECUE1H100DCQ	10P	S
C28	ECUV1A224KBV	0.22	
C30	F1G1A1040003	0.1	
C32	ECUE1A223KBQ	0.022	
C34	F1G1A1040003	0.1	
C36	F1G1H221A541	220P	
C37	F1G1A1040003	0.1	
C38	F1G1A1040003	0.1	
C39	ECUV1A105KBV	1	
C40	PQCUV1A225KB	2.2	
C41	PQCUV1H103KB	0.01	
C42	ECUV1H060DCV	6P	
C43	ECJ0EC1H270J	27P	
C44	F1G1A1040003	0.1	
C45	F1G1A1040003	0.1	
C46	PQCUV1A105KB	1	
C47	ECUV1C563KBV	0.056	
C48	F1G1A1040003	0.1	
C49	ECEA1HKA100	10	
C50	PQCUV1H104ZF	0.1	S
C53	F1G1A1040003	0.1	
C57	ECUV1H100DCV	10P	
C65	F1G1A1040003	0.1	
C76	ECUV1H103KBV	0.01	
C80	PSCUV2ET474K	0.47	S
C90	ECJ0EB1C103K	0.01	
C101	ECUV1H102KBV	0.001	
C102	ECUV1H102KBV	0.001	
C107	ECUV1H102KBV	0.001	
C109	PQCUV1A105KB	1	
C114	ECUE1H020CCQ	2P	S
C122	ECUE1H101JCQ	100P	S
C123	ECUE1H101JCQ	100P	S
C134	ECUV1H100DCV	10P	
C135	PQCUV1A105KB	1	
C136	ECUE1H102KBQ	0.001	S
C140	ECUV1H020CCV	2P	
C141	ECUV1H030CCV	3P	
C142	ECUV1H100DCV	10P	
C143	ECUV1H100DCV	10P	
C144	ECUV1H100DCV	10P	
C145	ECUV1H100DCV	10P	
C147	ECUV1H104MD	0.1	S

Ref. No.	Part No.	Part Name & Description	Remarks
C149	ECUV1H100DCV	10P	
C151	ECUV1A475KB	4.7	
C153	ECJ0EC1H220J	22P	
C154	ECUE1H100DCQ	10P	S
C155	ECUE1H020CCQ	2P	S
C156	ECUE1H100DCQ	10P	S
C157	ECJ0EC1H070D	7P	
C158	ECUE1H100DCQ	10P	S
C159	ECUE1H020CCQ	2P	S
C160	ECUE1H100DCQ	10P	S
C161	ECUE1H020CCQ	2P	S
C162	ECUE1H100DCQ	10P	S
C163	ECUE1H100DCQ	10P	S
C164	F1G1H151A541	150P	S
C171	ECUV1H102KBV	0.001	
C172	ECUE1H101JCQ	100P	S
C173	ECUE1H100DCQ	10P	S
C174	ECUV1C104KBV	0.1	
C181	ECUV1H100DCV	10P	
C183	ECUV1H100DCV	10P	
C184	ECUV1H100DCV	10P	
C191	ECUV1H100DCV	10P	
C197	ECUV1H030CCV	3P	
C198	ECUV1H100DCV	10P	
C201	ECUV1H100DCV	10P	
C203	ECUE1H100DCQ	10P	S
C206	ECUV1H100DCV	10P	
C213	ECUE1H100DCQ	10P	S
C215	ECJ1VB1H472K	0.0047	
C262	ECUV1H100DCV	10P	
C264	ECUE1H100DCQ	10P	S
C265	ECUE1H100DCQ	10P	S
C306	ECUE1H100DCQ	10P	S
C311	ECUE1H100DCQ	10P	S
C312	ECUV1H100DCV	10P	
C313	ECUV1H100DCV	10P	
C314	ECUE1H100DCQ	10P	S
C315	ECUE1H100DCQ	10P	S
C316	ECUE1H100DCQ	10P	S
C317	ECUE1H100DCQ	10P	S
C319	ECJ0EB1H471K	470P	
		(OTHERS)	
IC2	PQLP10263Z	RF UNIT	
X1	H0D103500003	CRYSTAL OSCILLATOR	
SW1	EVQQJJ05Q	SPECIAL SWITCH	

31.2. Handset

31.2.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
101	PQGP10290Z2	PANEL, LCD (for KX-TCA181UAS)	AS-HB
101	PQGP10290Z3	PANEL, LCD (for KX-TCA181UAT)	AS-HB
102	PQHS10711Z	TAPE, DOUBLE SIDED (LCD)	
103	PQGG10407Z1	GRILLE, OUTER	ABS-HB
104	PQKM10690Z1	CABINET BODY (for KX-TCA181UAS)	ABS-HB
104	PQKM10690Z2	CABINET BODY (for KX-TCA181UAT)	ABS-HB
105	PQHR11148Z	OPTIC CONDUCTIVE PARTS, LED LENS	PS-HB
106	PQGT18304Z	NAME PLATE (for KX-TCA181UAS)	
106	PQGT18304X	NAME PLATE (for KX-TCA181UAT)	
107	PQHS10712Z	SPACER, LCD	
108	PQSX10298V	KEYBOARD SWITCH, RUBBER	
109	PQHR11146Z	OPTIC CONDUCTIVE PARTS, KEY LENS	PMMA-HB
110	PQHS10467Z	COVER, SP NET	
111	L0AD02A00015	RECEIVER	
112	PQHR11142Z	GUIDE, RECEIVER	ABS-HB
113	L5DZDED00002	LIQUID CRYSTAL DISPLAY	
114	PQJE10153Z	LEAD WIRE, FFC	
115	PQBC10427Z1	BUTTON, CURSOR	ABS-HB
116	PQSA10159Z	ANTENNA	
117	PQWE10041Z	BATTERY TERMINAL	
118	PQJT10233Z	CHARGE TERMINAL (L)	
119	PQJT10232Z	CHARGE TERMINAL (R)	
120	PQKF10680Z1	CABINET COVER (for KX-TCA181UAS)	ABS-HB
120	PQKF10680Z2	CABINET COVER (for KX-TCA181UAT)	ABS-HB
121	PQKE10408Z1	COVER, E/P (for KX-TCA181UAS)	
121	PQKE10408Z2	COVER, E/P (for KX-TCA181UAT)	
122	PQJC10056Z	BATTERY TERMINAL	
123	PQKE10409Z1	COVER, USB (for KX-TCA181UAS)	
123	PQKE10409Z2	COVER, USB (for KX-TCA181UAT)	
124	PQHR11149Z	COVER, IrDA LENS	PMMA-HB
125	PQHR11145Z	GUIDE, MONITOR SP	ABS-HB
126	PQHG10702Z	RUBBER PARTS, SPEAKER	
127	L0AD02A00026	SPEAKER	
128	PQHS10622Z	SPACER, SP NET	
129	PQGG10303Z1	GRILLE, MONITOR SP	ABS-HB
130	PQHX11353Z	PLASTIC PARTS, BATTERY COVER SHEET	
131	PQHS10561Y	SPACER, BATTERY COVER	
132	PQKK10591Z1	LID, BATTERY COVER	ABS-HB

31.2.2. Main P.C.Board Parts

Note:

(*1) When replacing IC1 or IC11, data need to be written to them with PQZZTCD816UA. Refer to **Handset** (P.42) of **THINGS TO DO AFTER REPLACING IC**.

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWP1D826UAR	MAIN P.C.BOARD ASS´Y (RTL) (for KX-TCD816UAS/UAT)	
PCB100	PQWP1A181UAR	MAIN P.C.BOARD ASS´Y (RTL) (for KX-TCA181UAS/UAT)	
		(ICs)	
IC1	C1CB00001830	IC (BBIC) (*1)	
IC2	C1BB00000265	IC	
IC3	C0JBAA000386	IC	
IC8	C0JBAE000352	IC	
IC11	PQWICA181UAR	IC (FLASH MEMORY) (*1)	
IC13	C3BBHG000103	IC	
IC15	C1CB00001839	IC	
IC18	C0DBZFD00054	IC	
IC19	C0JBAB000675	IC	
IC21	B3RBC0000026	IC	
		(TRANSISTORS)	
Q1	PQVTFDN335N	TRANSISTOR(SI)	S
Q2	B1ADGE000004	TRANSISTOR(SI)	
Q3	B1ADGE000004	TRANSISTOR(SI)	
Q4	B1ADGE000004	TRANSISTOR(SI)	
Q5	B1ABCF000103	TRANSISTOR(SI)	
Q6	B1ABCF000103	TRANSISTOR(SI)	
Q7	B1ABCF000103	TRANSISTOR(SI)	
Q8	B1ABCF000103	TRANSISTOR(SI)	
Q9	UN9219J	TRANSISTOR(SI)	S
Q10	PSVTDTC143X	TRANSISTOR(SI)	S
Q11	B1ADCF000040	TRANSISTOR(SI)	
Q12	B1ABCF000103	TRANSISTOR(SI)	
Q16	B1ABGE000006	TRANSISTOR(SI)	
Q18	PSVTDTC143X	TRANSISTOR(SI)	S
Q19	B1ABCF000103	TRANSISTOR(SI)	
Q20	B1ABCF000103	TRANSISTOR(SI)	
		(DIODES)	
D1	B0JCME000035	DIODE(SI)	
D4	MA8047	DIODE(SI)	S
D5	MA8047	DIODE(SI)	S
D6	B0BC2R1A0006	DIODE(SI)	
D7	MA2Z72000	DIODE(SI)	
D8	B0JCDD000002	DIODE(SI)	
D9	B0JCDD000002	DIODE(SI)	
D10	B0JCDD000002	DIODE(SI)	

Ref. No.	Part No.	Part Name & Description	Remarks
D11	B0JCDD000002	DIODE(SI)	
D12	MA8051	DIODE(SI)	S
D13	MA8051	DIODE(SI)	S
D14	B0JCDD000002	DIODE(SI)	
D15	B0JCDD000002	DIODE(SI)	
LED8	B3AEB0000061	LED	
		(COILS)	
L1	G1C220M00037	COIL	S
L4	G1C100MA0072	COIL	
L5	G1C100MA0072	COIL	
L6	PQLQR2M22NJ	COIL	S
L7	PQLQR2M22NJ	COIL	S
F1	PQLQR2M5N6K	COIL	S
		(JACK AND CONNECTORS)	
CN4	K2HD103D0001	JACK	S
CN5	K1MN30B00031	CONNECTOR	S
CN8	K1FA105E0003	CONNECTOR	
CN9	K1MN16B00134	CONNECTOR	
		(COMPONENTS PARTS)	
RA1	D1H810240004	RESISTOR ARRAY	
RA2	D1H810240004	RESISTOR ARRAY	
		(RESISTORS)	
R1	ERJL06KJ47MV	47M	
R2	ERJ3EKF5602	56K	
R3	ERJ3EKF1503	150K	
R4	ERJ3GEYJ153	15K	
R5	ERJ3GEYJ471	470	
R6	ERJ3GEYJ103	10K	
R7	ERJ3GEYJ224	220K	
R8	ERJ2GEJ5R6	5.6	
R9	ERJ3GEYJ562	5.6K	
R10	ERJ3GEYF393	39K	S
R12	ERJ2GEJ393X	39K	
R13	ERJ2GEJ104	100K	
R14	ERJ2GEJ222	2.2K	
R15	ERJ3GEYJ270	27	
R16	ERJ3GEYJ103	10K	
R17	ERJ3GEYJ561	560	
R18	ERJ3GEYJ104	100K	
R19	ERJ3GEYJ335	3.3M	
R20	ERJ3GEYJ102	1K	
R21	ERJ3GEYJ102	1K	
R22	ERJ3GEYJ273	27K	
R23	ERJ3GEYJ102	1K	
R24	ERJ3GEYJ474	470K	
R25	ERJ3GEYJ331	330	
R26	ERJ2GEJ101	100	
R27	ERJ2GEJ104	100K	
R28	ERJ2GEJ222	2.2K	
R29	ERJ3GEYJ222	2.2K	
R31	ERJ3GEYJ270	27	
R32	ERJ3GEYJ270	27	
R33	ERJ2GEJ105X	1M	
R34	ERJ2GEJ104	100K	
R35	ERJ3GEYJ273	27K	
R36	ERJ3GEYJ473	47K	
R37	ERJ3GEYJ330	33	
R38	ERJ3GEYJ330	33	
R39	ERJ2GEJ273X	27K	
R40	ERJ2GEJ273X	27K	
R41	ERJ3GEYJ273	27K	
R42	ERJ2GEJ103	10K	
R43	ERJ6RSJR10V	0.1	
R44	ERJ2GEJ823	82K	
R45	ERJ2GEJ683	68K	
R46	ERJ3GEYJ562	5.6K	
R47	ERJ3GEYJ562	5.6K	
R48	ERJ2GE0R00	0	
R49	ERJ2GEJ104	100K	
R50	ERJ3GEYJ103	10K	
R55	ERJ3GEYJ390	39	
R56	ERJ3GEYJ390	39	
R57	ERJ3GEYJ680	68	

Ref. No.	Part No.	Part Name & Description	Remarks
R58	ERJ3GEYJ101	100	
R60	ERJ3GEYJ102	1K	
R61	ERJ3GEYJ103	10K	
R62	ERJ3GEY0R00	0	
R63	ERJ2GEJ103	10K	
R64	ERJ2GEJ103	10K	
R65	ERJ3GEY0R00	0	
R66	ERJ2GEJ334	330K	
R71	ERJ3GEYJ104	100K	
R72	ERJ3GEYJ102	1K	
R73	ERJ3GEYJ474	470K	
R74	ERJ3GEYJ1R0	1	
R75	ERJ3GEY0R00	0	
R76	ERJ2GEJ102	1K	
R77	ERJ2GE0R00	0	
R78	ERJ2GEJ221	220	
R80	ERJ3GEYJ100	10	
R81	ERJ2GEJ102	1K	
R82	ERJ2GEJ102	1K	
R83	ERJ2GEJ102	1K	
R90	ERJ3GEY0R00	0	
R91	ERJ2GEJ223	22K	
R92	ERJ2GEJ103	10K	
R95	ERJ2GEJ103	10K	
R96	ERJ3GEYJ270	27	
R97	ERJ3GEYJ270	27	
R98	ERJ2GEJ105X	1M	
R99	ERJ3GEYJ152	1.5K	
R100	ERJ2GEJ104	100K	
R101	ERJ2GEJ104	100K	
R102	ERJ2GEJ104	100K	
R114	ERJ2GEJ104	100K	
R117	ERJ3GEYJ102	1K	
R118	ERJ3GEYJ470	47	
R119	ERJ3GEYJ470	47	
R120	ERJ3GEYJ470	47	
R121	ERJ2GE0R00	0	
R123	ERJ2GEJ332	3.3K	
R124	ERJ2GEJ103	10K	
R125	ERJ2GEJ332	3.3K	
R126	ERJ2GEJ103	10K	
R127	ERJ2GEJ121	120	
R128	ERJ2GEJ391	390	
R129	ERJ2GEJ332	3.3K	
R130	ERJ2GEJ103	10K	
R150	ERJ3GEYJ222	2.2K	
R151	ERJ2GEJ104	100K	
R152	ERJ3EKF2703	270K	
R153	ERJ3GEYJ103	10K	
R154	ERJ2GEJ101	100	
R155	ERJ2GEJ101	100	
R156	ERJ2GEJ101	100	
R157	ERJ2GEJ101	100	
R158	ERJ2GEJ101	100	
R159	ERJ2GEJ101	100	
R160	ERJ2GEJ101	100	
R161	ERJ2GEJ101	100	
R162	ERJ2GEJ101	100	
R163	ERJ2GEJ101	100	
R164	ERJ2GEJ101	100	
R165	ERJ2GEJ101	100	
R166	ERJ2GEJ101	100	
R167	ERJ2GEJ101	100	
R168	ERJ2GEJ101	100	
R169	ERJ2GEJ101	100	
R170	ERJ2GEJ101	100	
R171	ERJ2GEJ101	100	
R172	ERJ2GEJ101	100	
R173	ERJ2GEJ101	100	
R174	ERJ2GEJ331	330	
R179	ERJ2GEJ101	100	
R201	ERJ2GE0R00	0	
R202	ERJ2GE0R00	0	

Ref. No.	Part No.	Part Name & Description	Remarks
R203	D0GA222JA015	2.2	
R204	ERJ2GE0R00	0	
		(CAPACITORS)	
C1	EEE0GA331WP	330	
C3	ECUV1C104KBV	0.1	
C4	ECUV1H100DCV	10P	
C5	ECST0JY106	10	
C7	ECUV1H100DCV	10P	
C8	ECUV1A224KBV	0.22	
C9	ECUV1C683KBV	0.068	
C10	F1G1A1040003	0.1	
C12	ECUV1A105KBV	1	
C13	ECUV1C104KBV	0.1	
C14	ECUV1H100DCV	10P	
C15	ECUV1A105KBV	1	
C16	ECUV1C104KBV	0.1	
C17	ECUV1H330JCV	33P	
C18	ECUV1H102KBV	0.001	
C19	F1G1A1040003	0.1	
C20	ECUV1C104KBV	0.1	
C21	ECUV1C104KBV	0.1	
C22	F1G1A1040003	0.1	
C23	F1G1A1040003	0.1	
C24	ECUV1C104KBV	0.1	
C25	ECUV1C103KBV	0.01	
C26	F1G1A1040003	0.1	
C29	ECUV1C104KBV	0.1	
C30	ECUV1A105KBV	1	
C31	ECUV1H102KBV	0.001	
C32	ECUV1H270JCV	27P	
C33	F1G1H271A571	270P	
C34	F1G1A1040003	0.1	
C35	ECUE1H102KBQ	0.001	S
C36	ECJ0EC1H470J	47P	
C37	F1G1A6830003	0.068	
C38	ECUV1H471JCV	470P	S
C39	ECJ0EB0J105K	1	
C40	ECST0JY106	10	
C41	ECJ0EC1H100D	10P	
C42	ECUV1A106ZF	10	S
C43	ECJ0EC1H100D	10P	
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	F1G1A1040003	0.1	
C53	ECJ0EC1H151J	150P	
C54	ECJ0EC1H100D	10P	
C55	ECJ0EC1H020C	2P	
C56	ECUV1H100DCV	10P	
C57	EEE0JA331P	330	
C58	ECJ0EB0J105K	1	
C59	ECUE1H101JCQ	100P	S
C60	ECJ0EC1H100D	10P	
C61	F1G1A1040003	0.1	
C63	ECJ0EB0J105K	1	
C64	ECJ0EC1H220J	22P	
C65	ECJ0EC1H220J	22P	
C66	ECJ0EC1H220J	22P	
C67	ECJ0EC1H101J	100P	
C68	F1G1A6830003	0.068	
C69	F1G1A1040003	0.1	
C70	F1G1A1040003	0.1	
C75	ECUV1H100DCV	10P	
C77	ECUV1H100DCV	10P	
C80	PQCUV1A225KB	2.2	
C83	ECJ0EB1H102K	0.001	
C86	ECUV1A105KBV	1	
C87	ECJ0EC1H100D	10P	
C89	ECJ0EC1H100D	10P	
C90	ECJ0EC1H100D	10P	
C91	ECJ0EC1H100D	10P	
C92	ECUV1H100DCV	10P	
C93	ECUV1H101JCV	100P	
C94	ECUV1H101JCV	100P	
C102	ECJ1VB1C105K	1	
C106	ECJ0EB0J105K	1	
C107	ECJ1VB1C105K	1	
C108	ECJ1VB1C105K	1	
C109	ECUV1C104KBV	0.1	
C111	ECJ1VB1C105K	1	
C115	ECUV1A475KB	4.7	
C117	ECJ0EC1H220J	22P	
C118	ECJ1VB1C105K	1	
C119	ECUV1A475KB	4.7	
C122	ECUV1C103KBV	0.01	
C123	ECUV1C104KBV	0.1	
C124	ECUV1C104KBV	0.1	
C125	ECUV1H030CCV	3P	
C129	ECUV1H050CCV	5P	S
C131	ECUV1C104KBV	0.1	
C134	F1G1A1040003	0.1	
C135	ECUV1H050CCV	5P	S
C136	F1G1A1040003	0.1	
C150	ECUE1H102KBQ	0.001	S
C152	ECUE1H102KBQ	0.001	S
		(OTHERS)	
MIC	L0CBAB000116	MICROPHONE	
E101	PQHR11147Z	GUIDE, MIC	ABS-HB
IC20	PQLP10263Z	RF UNIT	
SW1	K0C115A00005	SEESAW SWITCH	
X1	H0D103500005	CRYSTAL OSCILLATOR	
X2	H2C600400004	CRYSTAL OSCILLATOR	

31.2.3. Operational P.C. Borad Parts

Ref. No.	Part No.	Part Name & Description	Remarks
PCB200	PQWP2A181EXR	OPERATIONAL P.C.BOARD ASS´Y (RTL)	
		(DIODES)	
LED4	LNJ310M6URA	LED	
LED5	LNJ310M6URA	LED	
LED6	LNJ310M6URA	LED	
LED7	LNJ310M6URA	LED	
		(CONNECTOR)	
CN10	K1MN16B00110	CONNECTOR	
		(OTHERS)	
E102	ESP1V120R	SPECIAL SWITCH	
E103	PQJE10154Z	LEAD WIRE, FFC	
E104	PQHR11144Z	GUIDE, PCB HOLDER	

31.3. Charger Unit

31.3.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
300	PQLV30040ZS	CHARGER UNIT (for KX-TCA181UAS)	
300	PQLV30040ZT	CHARGER UNIT (for KX-TCA181UAT)	
300-1	PQGG10308Z1	GRILLE (for KX-TCA181UAS)	PC-HB
300-1	PQGG10308Z3	GRILLE (for KX-TCA181UAT)	PC-HB
300-2	PQKM10698Z1	CABINET BODY (for KX-TCA181UAS)	ABS-HB
300-2	PQKM10698Z3	CABINET BODY (for KX-TCA181UAT)	ABS-HB
300-3	PQHR11132Z	CASE, CHARGE TERMINAL	PS-HB
300-4	PQKE10401Z1	HOLDER, CHARGE TERMINAL (L)	POM-HB
300-5	PQKE10402Z1	HOLDER, CHARGE TERMINAL (R)	POM-HB
300-6	PQJT10227Z	CHARGE TERMINAL (L)	
300-7	PQJT10228Z	CHARGE TERMINAL (R)	

Ref. No.	Part No.	Part Name & Description	Remarks
300-8	PQKF10689Z1	CABINET COVER (for KX-TCA181UAS)	PS-HB
300-8	PQKF10689Z3	CABINET COVER (for KX-TCA181UAT)	PS-HB
300-9	PQGT18212W	NAME PLATE (for KX-TCA181UAS)	
300-9	PQGT18212U	NAME PLATE (for KX-TCA181UAT)	
300-10	PQHA10023Z	RUBBER PARTS, FOOT CUSHION	

31.3.2. Main P.C.Board Parts

Ref. No.	Part No.	Part Name & Description	Remarks
PCB300	PQWPA181ESCH	MAIN P.C.BOARD ASS´Y (RTL)	
		(DIODE)	
D2	B0JCME000035	DIODE(SI)	
		(JACK)	
CN1	PQJJ1B4Y	JACK	S
		(RESISTORS)	
R1	ERJ1WYJ180U	18	
R2	ERJ1WYJ180U	18	

31.4. Accessories and Packing Materials

Note:

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

31.4.1. KX-TCD816UAS/UAT

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLV19CEX	AC ADAPTOR	⚠
A2	PQJA10075Z	CORD, TELEPHONE	
A3	PQJA10165Z	CORD, AUDIO CABLE	⚠
A4	PQJA10166Z	CORD, USB CABLE	
A5	PQKE10412Z1	HANGER, BELT CLIP	
A6	PQQX14756Z	INSTRUCTION BOOK (for Ukrainian) (*1)	
A7	PQQX14755Z	INSTRUCTION BOOK (for Russian) (*1)	
A8	PQQW14793Z	QUICK GUIDE (for Ukrainian)	
A9	PQQW14792Z	QUICK GUIDE (for Russian)	
A10	PQQW14937Z	PC LEAFLET (for Ukrainian)	
A11	PQQW14936Z	PC LEAFLET (for Russian)	
A12	PQJKTCD820Z	MEMORY PARTS, CD-R WITH DATA	
P1	PQPH10078Z	PROTECTION COVER (for Base Unit)	
P2	PQPH10086Z	PROTECTION COVER (for Handset)	
P3	PQPK14991Z	GIFT BOX	

31.4.2. KX-TCA181UAS/UAT

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLV200CEX	AC ADAPTOR	⚠
A2	PQKE10412Z1	HANGER, BELT CLIP	
A3	PQQX14776Z	INSTRUCTION BOOK (for Ukrainian) (*1)	
A4	PQQX14775Z	INSTRUCTION BOOK (for Russian) (*1)	
P1	PQPP10086Z	PROTECTION COVER (for Charger Unit)	
P2	PQPH10086Z	PROTECTION COVER (for Handset)	
P3	PQPK14993Z	GIFT BOX	

31.5. Fixtures and Tools

Note:

(*1) See **The Setting Method of JIG (Base Unit)** (P.30), and **The Setting Method of JIG (Handset)** (P.39).

Part No.	Part Name & Description	Remarks
PQZZ1CD300E	JIG CABLE (*1)	
PQZZTCD816UA	BATCH FILE CD-ROM (*1)	

32 FOR SCHEMATIC DIAGRAM

32.1. 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.

32.2. 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.

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

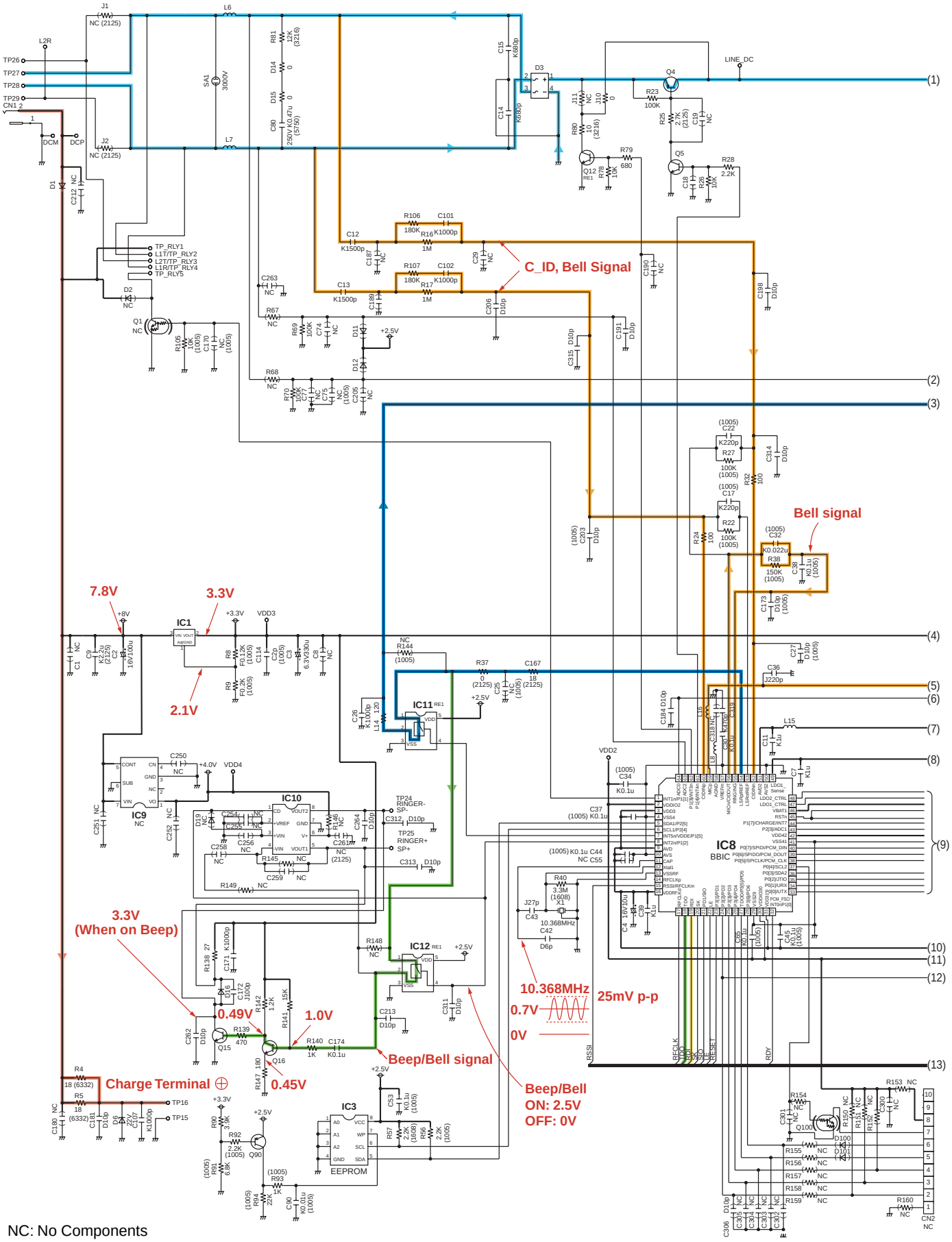
Notes:

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

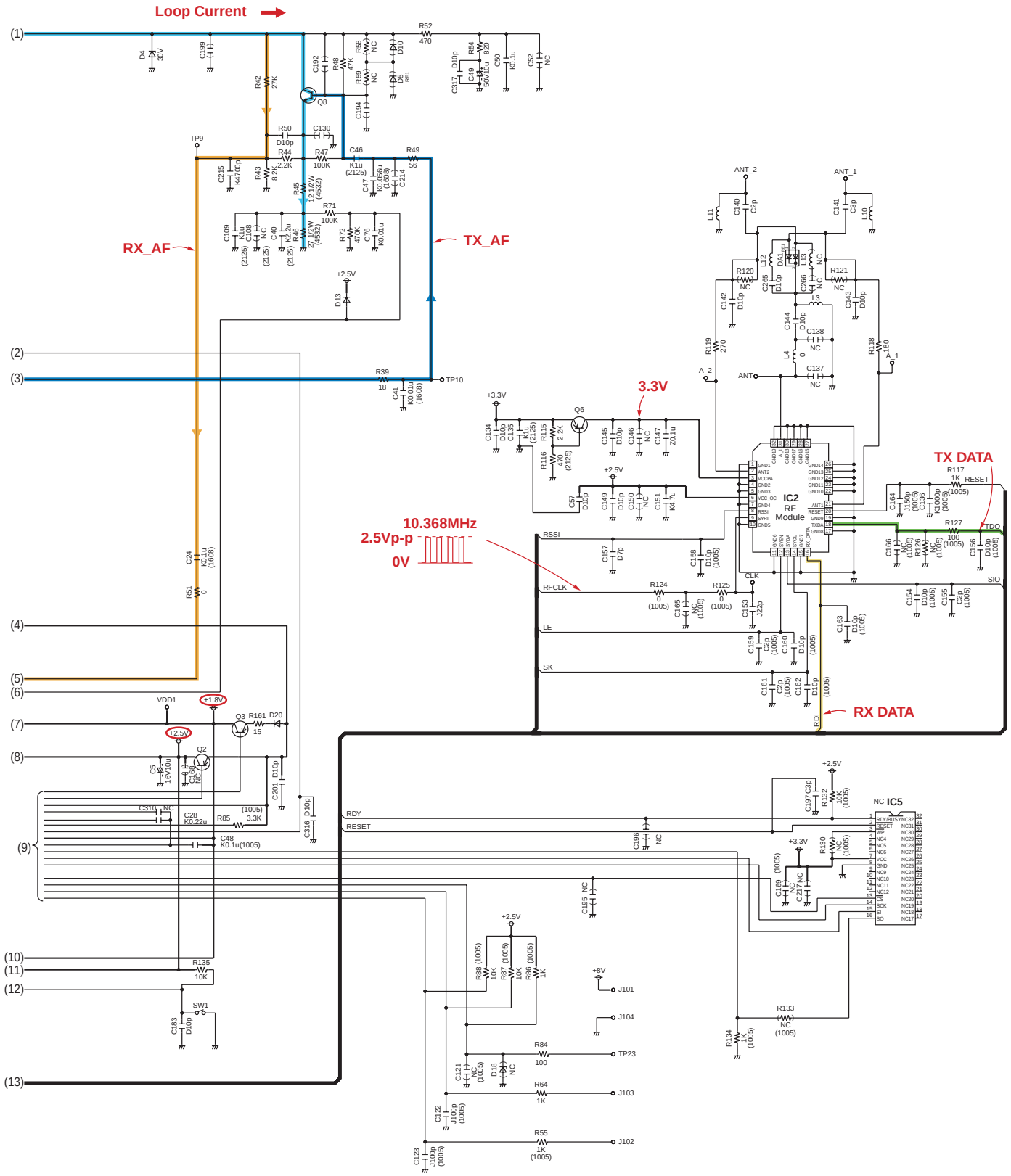
> Important Safety Notice:
> Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

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

33 SCHEMATIC DIAGRAM (BASE UNIT)



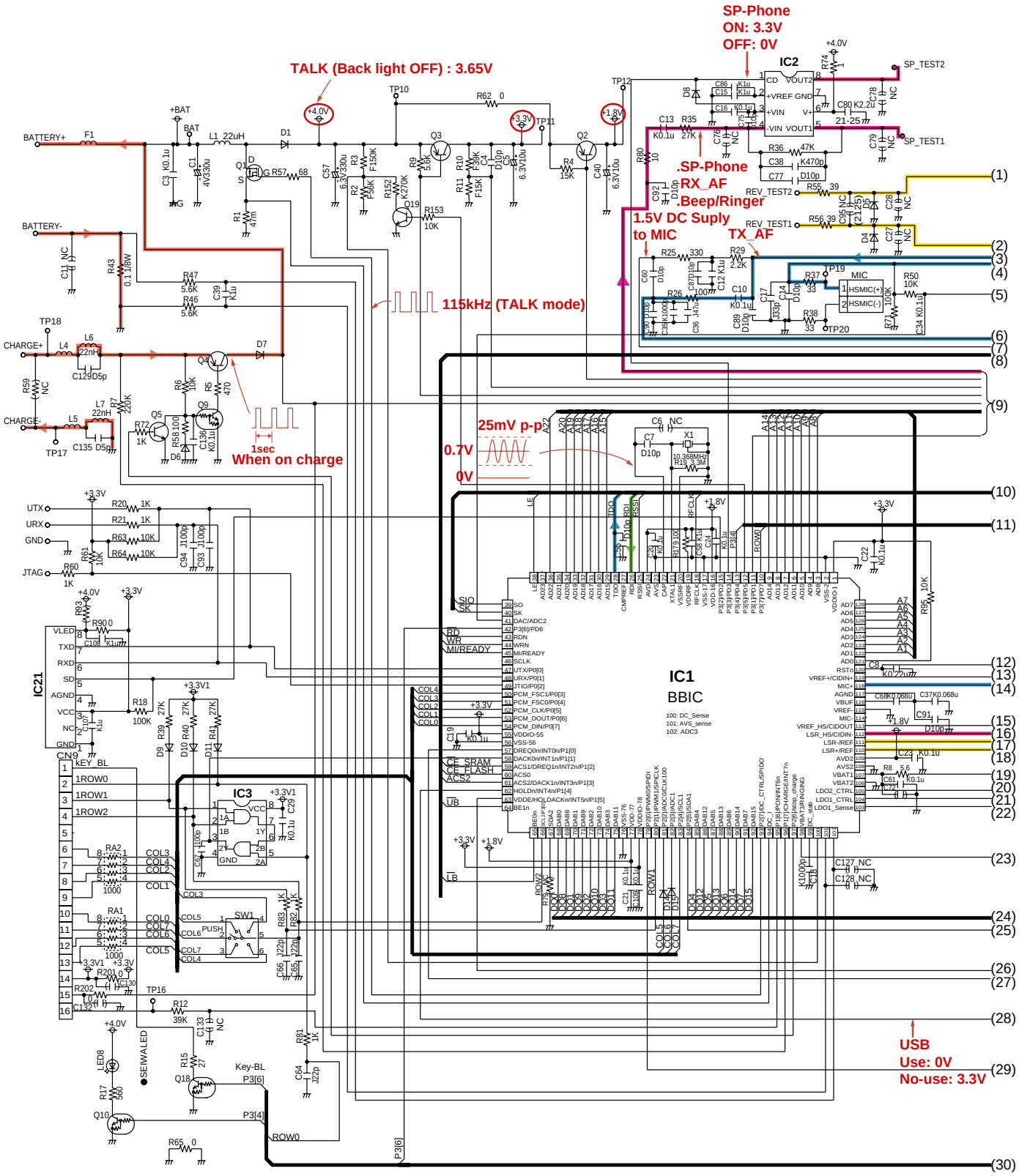
NC: No Components



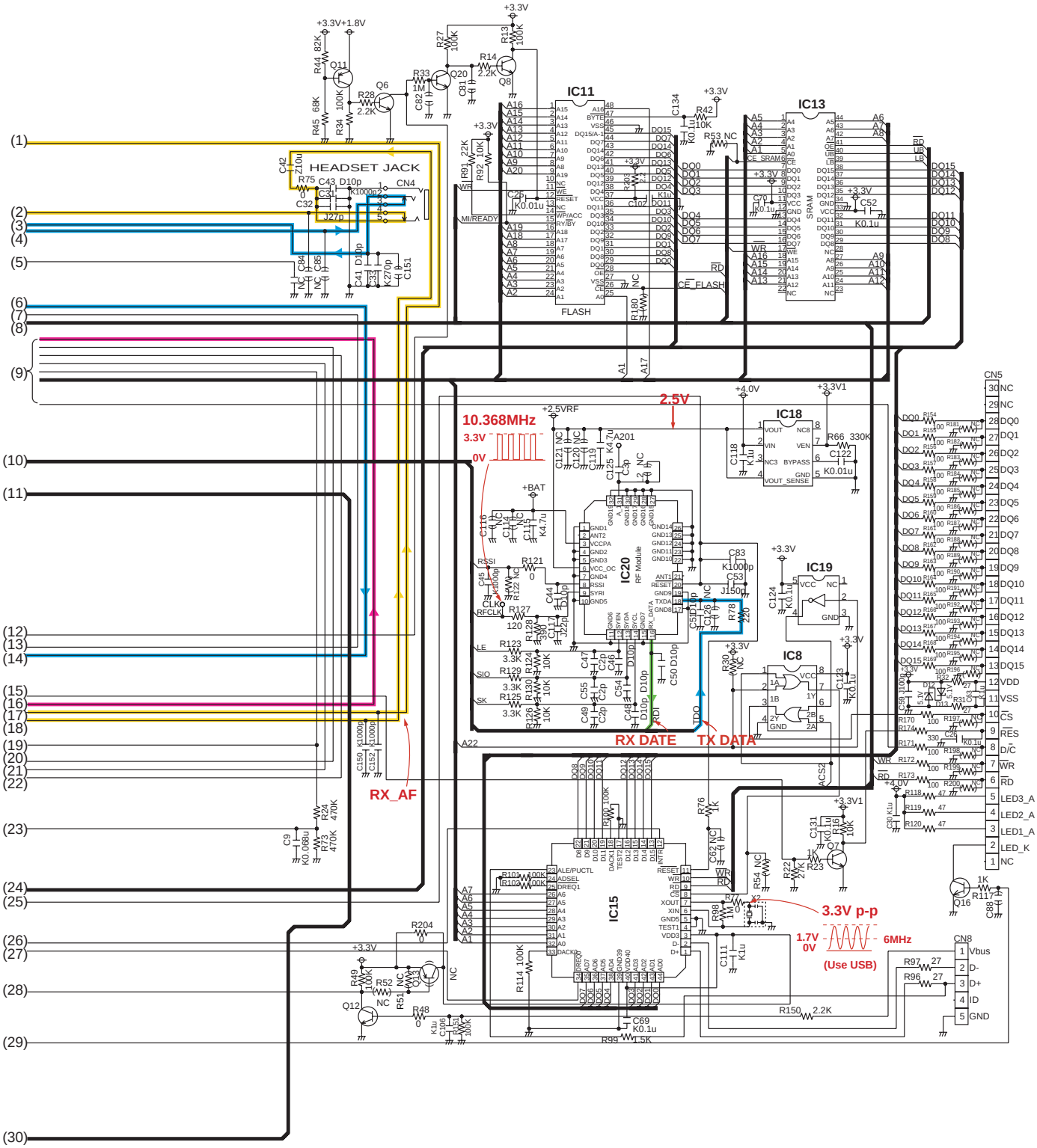
NC: No Components

KX-TCD816 SCHEMATIC DIAGRAM (Base Unit)

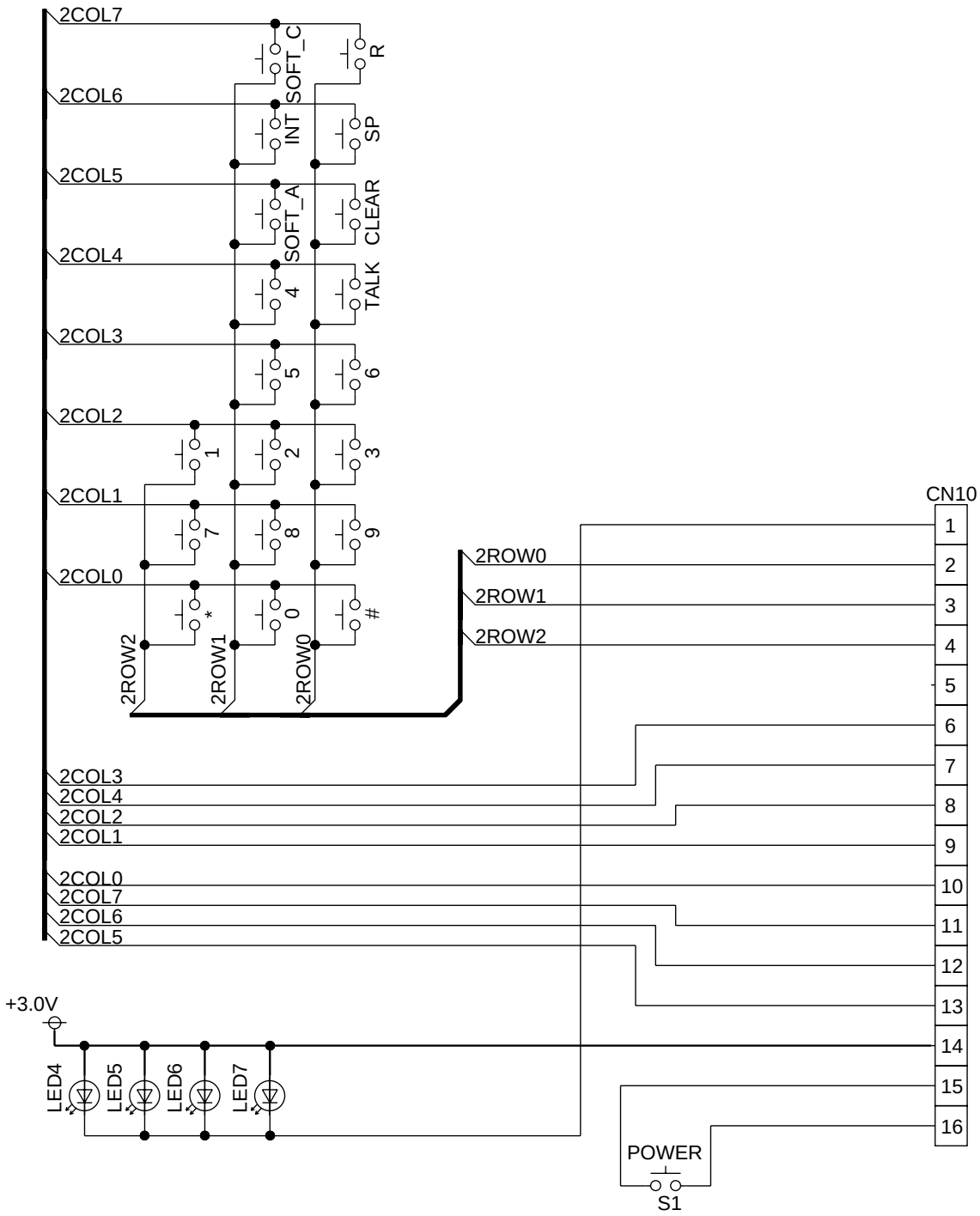
34 SCHEMATIC DIAGRAM (HANDSET)



NC : No Components

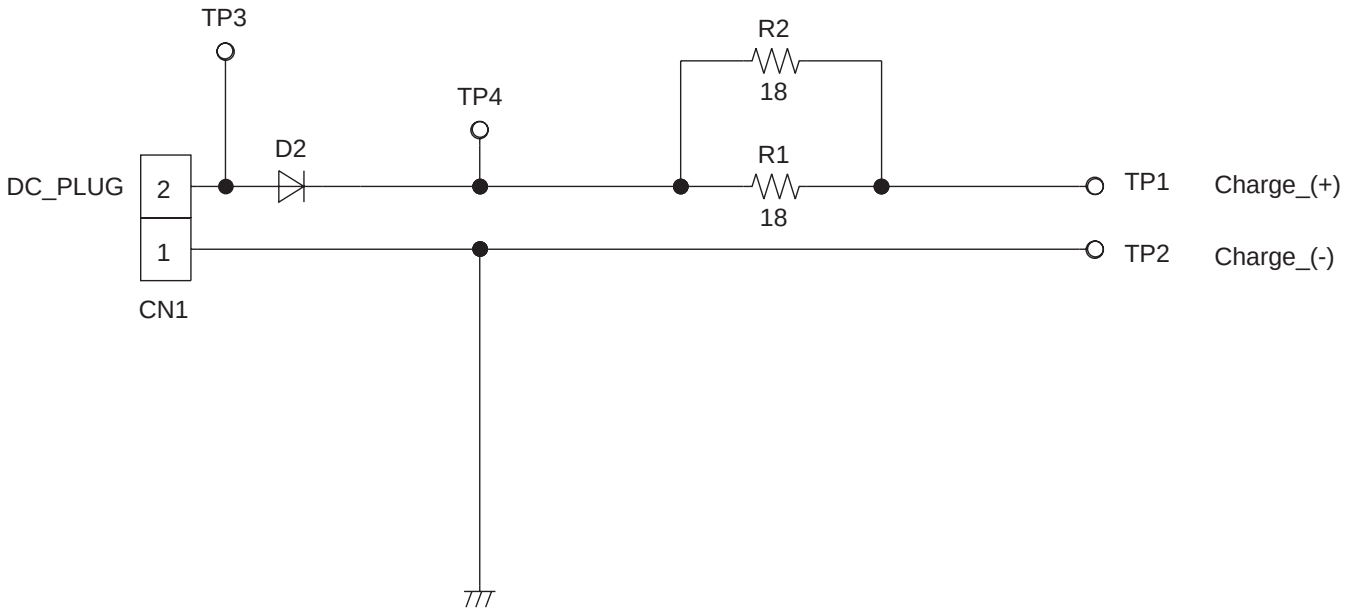

HEADSET JACK
IC11
FLASH
IC13
SRAM
IC18
IC19
IC8
IC20
RF Module
IC15
10.368MHz
3.3V
0V
2.5V
RX DATE
TX DATA
RX_AF
3.3V p-p
1.7V
0V
6MHz
(Use USB)
CN4
CN5
CN8
Vbus
D-
D+
ID
GND
LED3_A
LED2_A
LED1_A
LED_K
RD
WR
D/C
RES
CS
VDD
VSS
NC : No Components
KX-TCA181 SCHEMATIC DIAGRAM (Handset)

35 SCHEMATIC DIAGRAM (HANDSET_OPERATION)



KX-TCD181 SCHEMATIC DIAGRAM (Handset_Operation)

36 SCHEMATIC DIAGRAM (CHARGER UNIT)



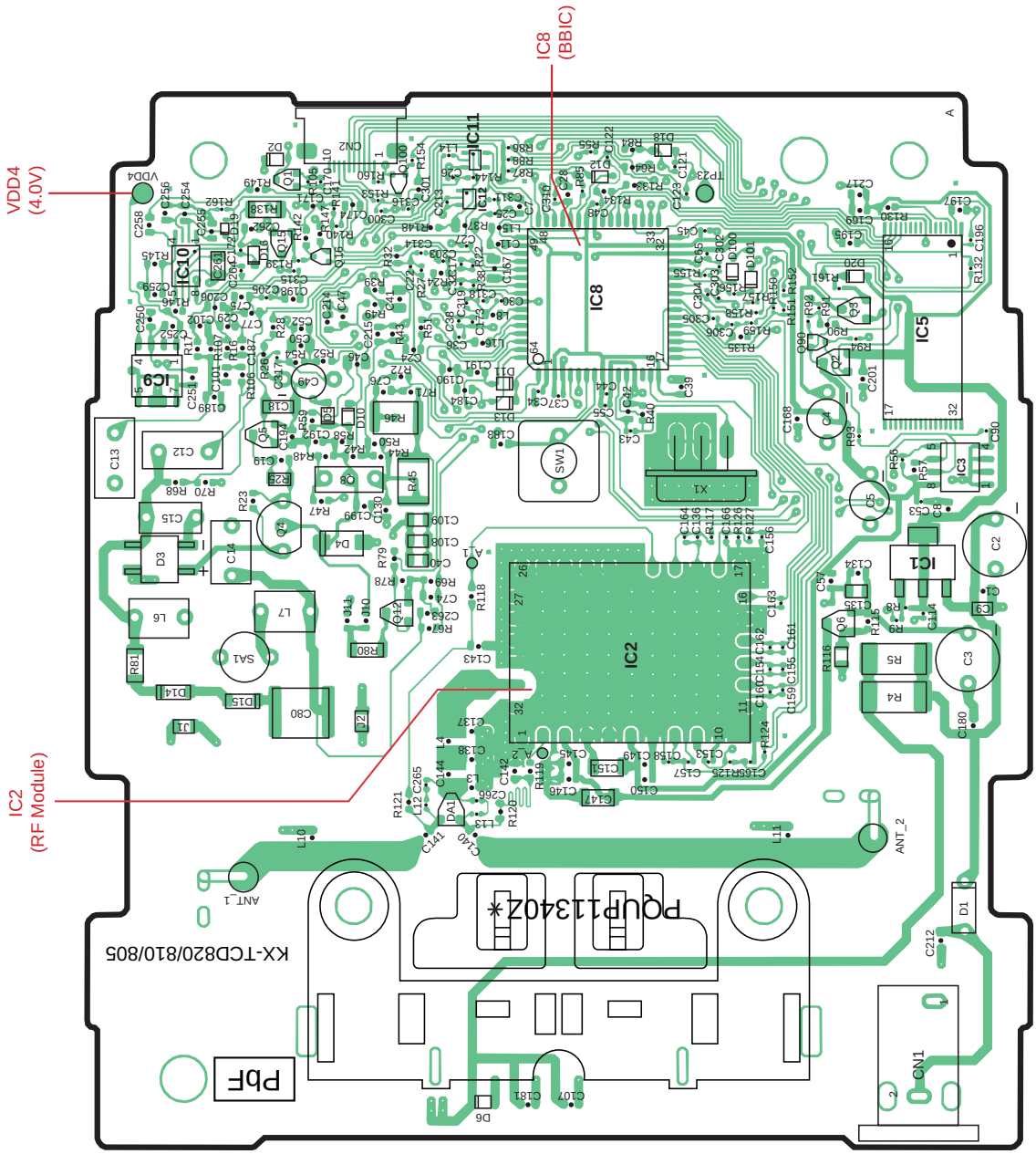
NC : No Components

SCHEMATIC DIAGRAM (Charger Unit)

Memo

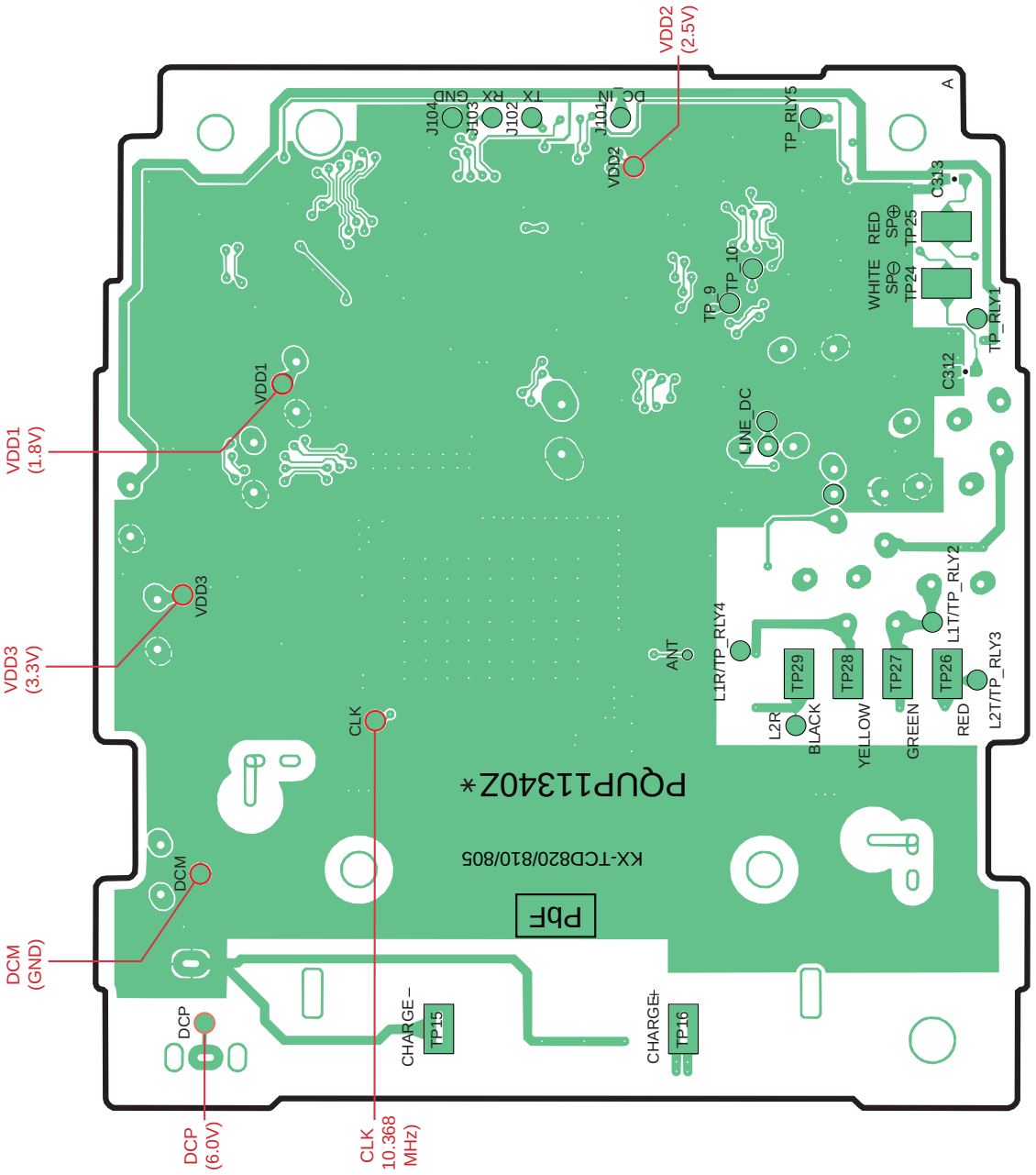
37 CIRCUIT BOARD (BASE UNIT)

37.1. Component View



KX-TCD816 CIRCUIT BOARD (Base Unit (Component View))

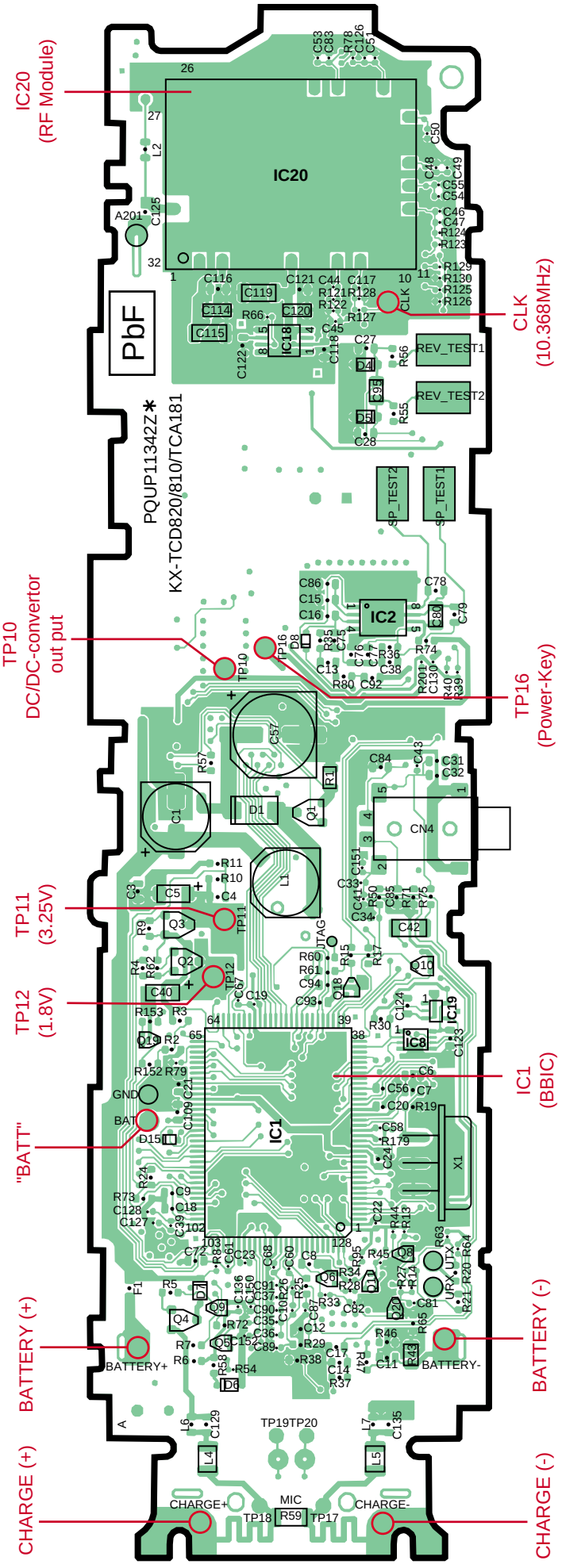
37.2. Flow Solder Side View



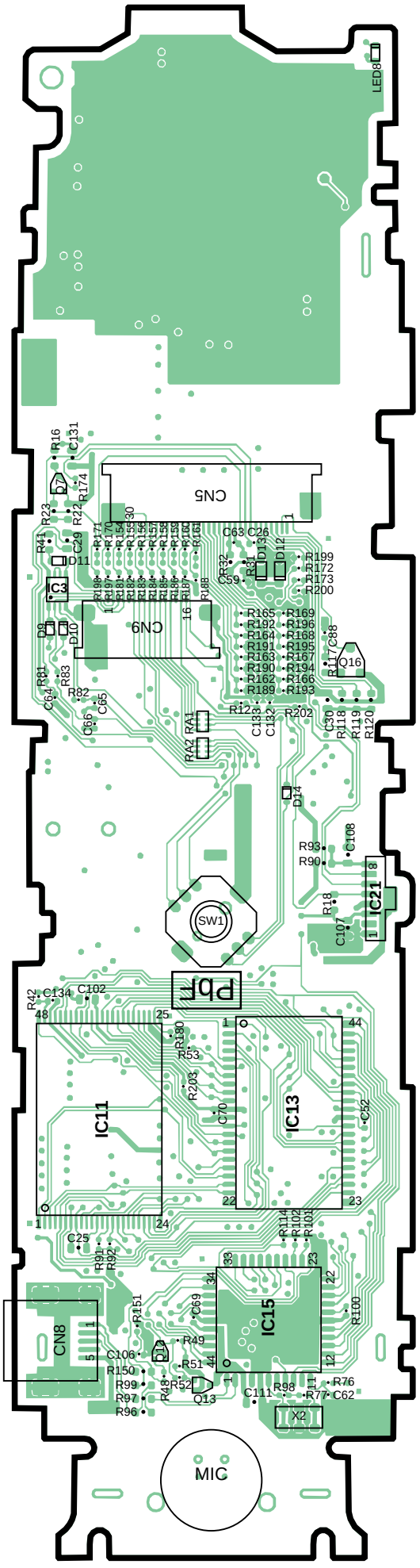
KX-TCD816 CIRCUIT BOARD (Base Unit (Flow Solder Side View))

38 CIRCUIT BOARD (HANDSET)

38.1. Component View



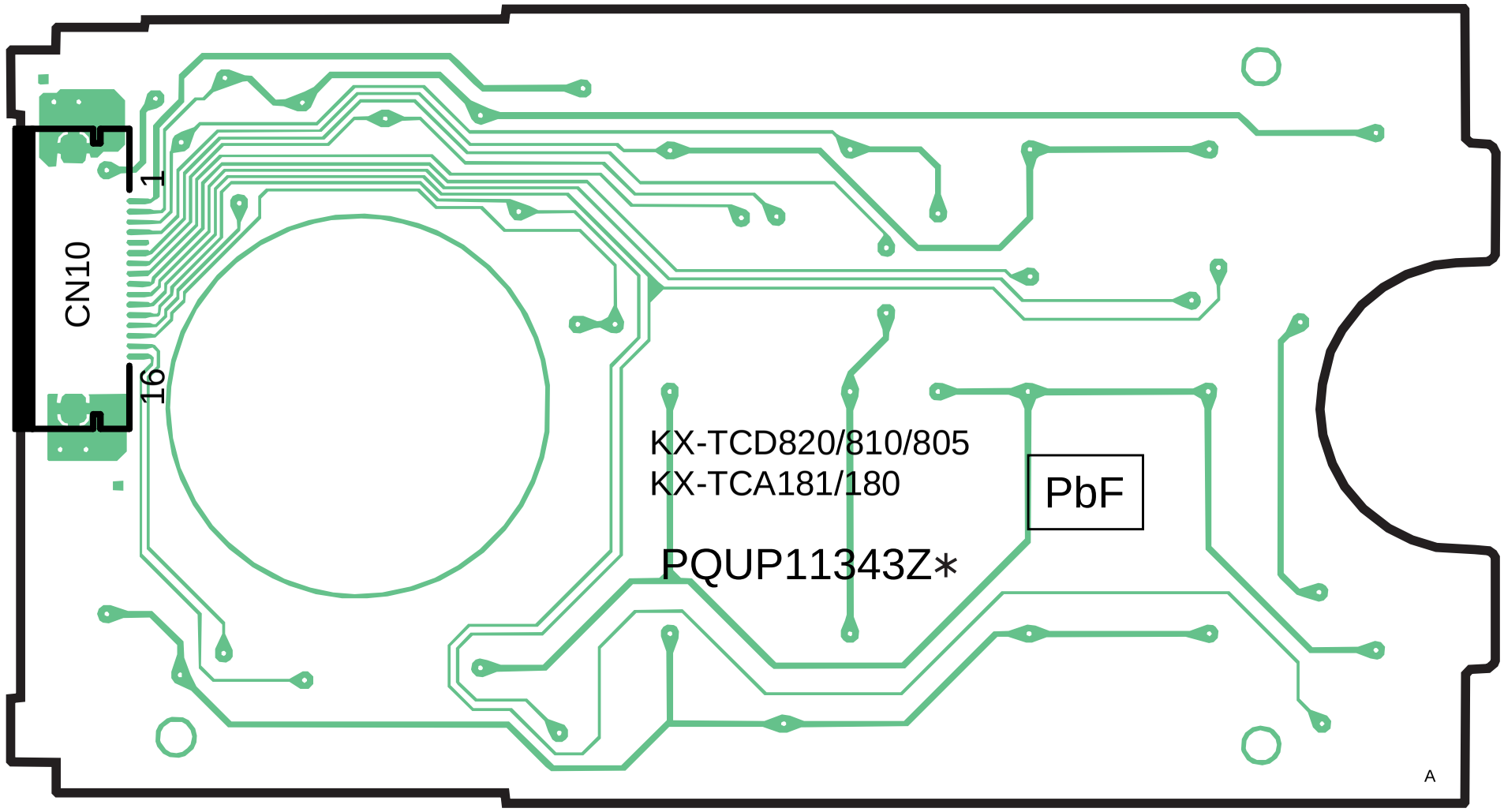
38.2. Flow Solder Side View



KX-TCA181 CIRCUIT BOARD (Handset (Flow Solder Side View))

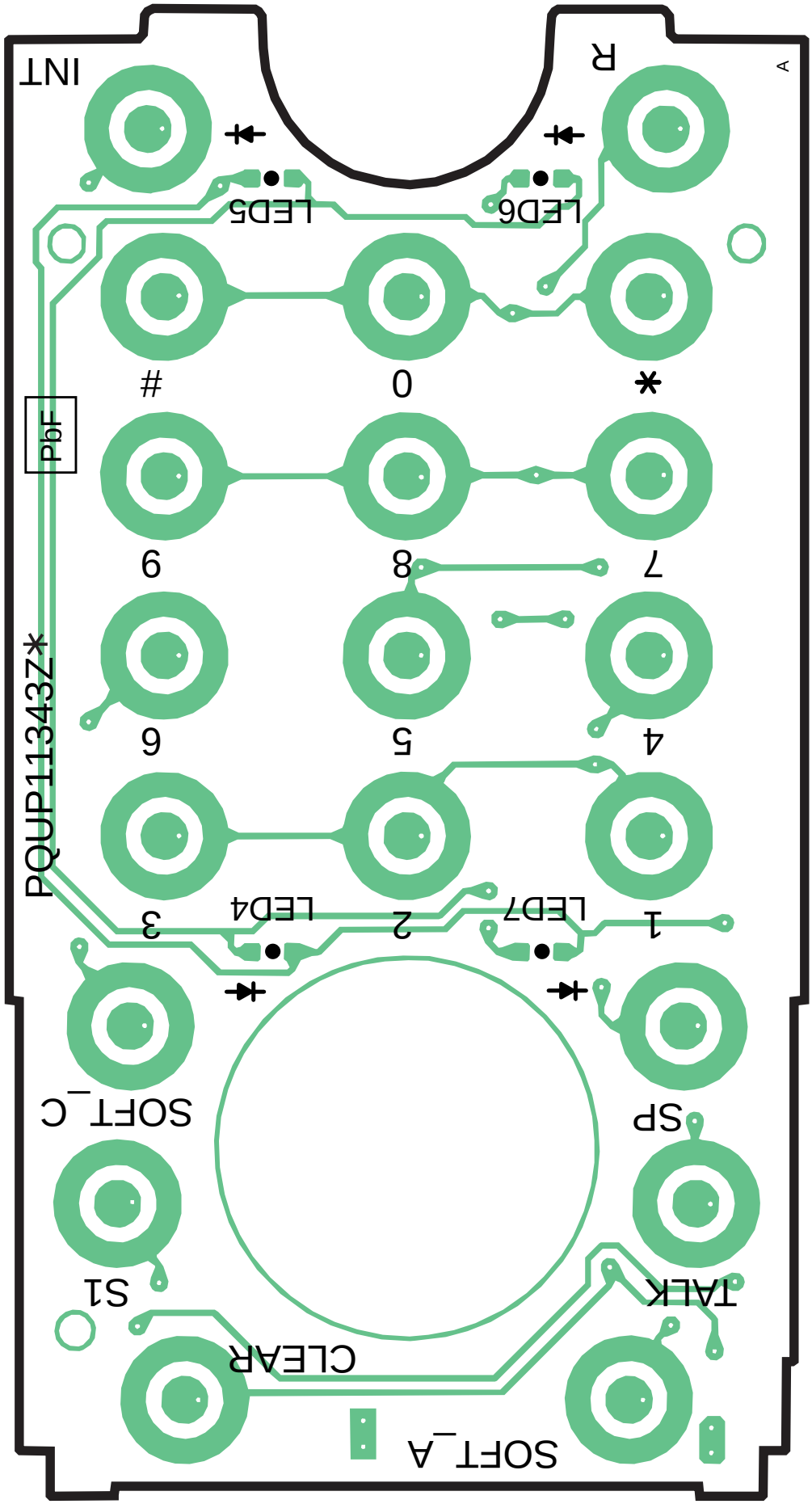
39 CIRCUIT BOARD (HANDSET_OPERATION)

39.1. Component View



KX-TCA181 CIRCUIT BOARD (Handset_Operation (Component View))

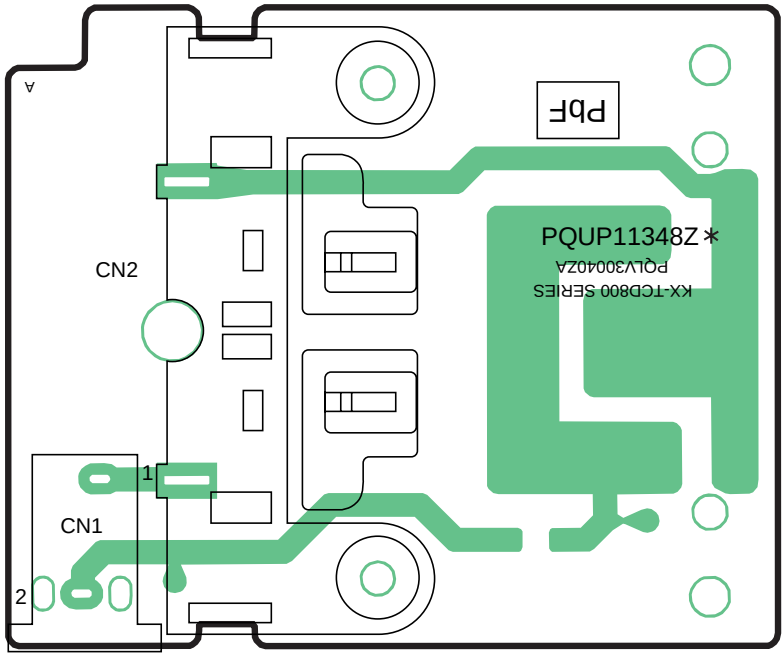
39.2. Flow Solder Side View



KX-TCA181 CIRCUIT BOARD (Handset_Operation (Flow Solder Side View))

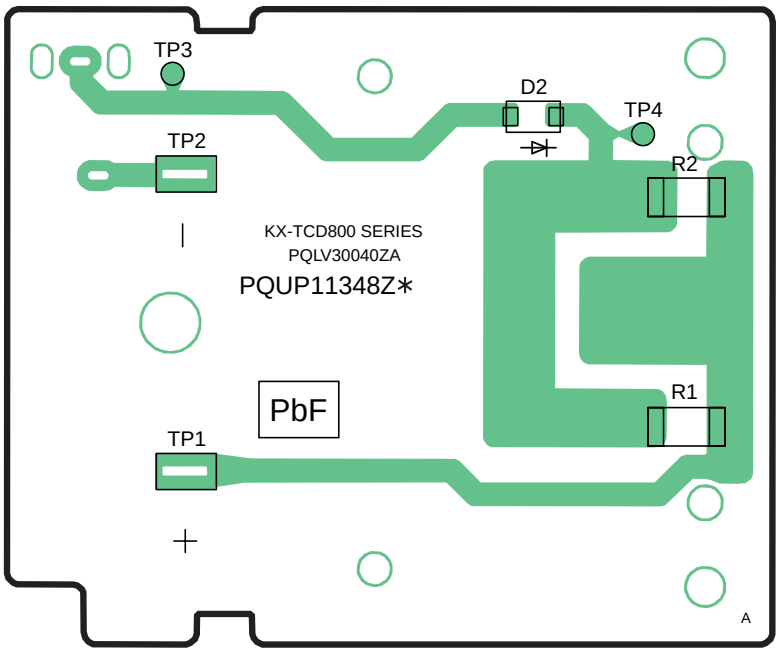
40 CIRCUIT BOARD (CHARGER UNIT)

40.1. Component View



CIRCUIT BOARD (Charger Unit (Component View))

40.2. Flow Solder Side View



CIRCUIT BOARD (Charger Unit (Flow Solder Side View))

G/S
KXTCD816UAS
KXTCD816UAT
KXTCA181UAS
KXTCA181UAT