

Service Manual

DECT Portable Station

KX-TCA256X

(for Taiwan and Mexico)



⚠ WARNING

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

IMPORTANT SAFETY NOTICE

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

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF. Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.

When this mark does appear please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

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

Panasonic

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1 Safety Precautions

1.1. For Service Technicians

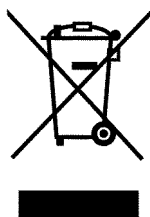
ICs and LSIs are vulnerable to static electricity.

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

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

1.2. Disposal Cautions

1.2.1. Information on Disposal for Users of Waste Electrical & Electronic Equipment (private households)



This symbol on the products and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.

For proper treatment, recovery and recycling, please take these products to designated collection points, where they will be accepted on a free of charge basis. Alternatively, in some countries you may be able to return your products to your local retailer upon the purchase of an equivalent new product.

Disposing of this product correctly will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point. Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

1.2.2. For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

1.2.3. Information on Disposal in other Countries outside the European Union

This symbol is only valid in the European Union.

If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

2 Warning

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

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

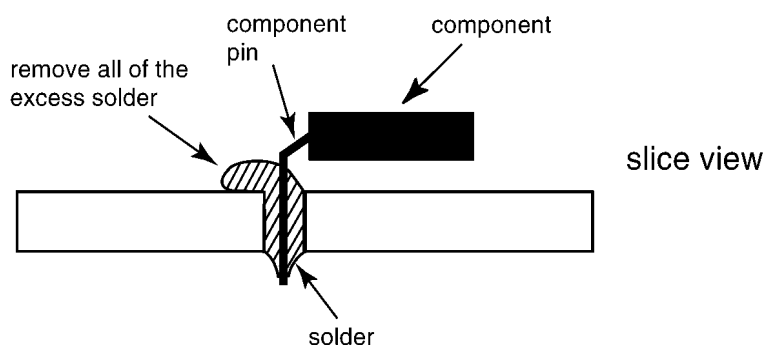
Caution

- PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C).

Exercise care while using higher temperature soldering irons.:

Do not heat the PCB for too long time in order to prevent solder splash or damage to the PCB.

- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F, (600°C).
- When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See figure, below).



2.1.1. 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

2.2. Battery Caution

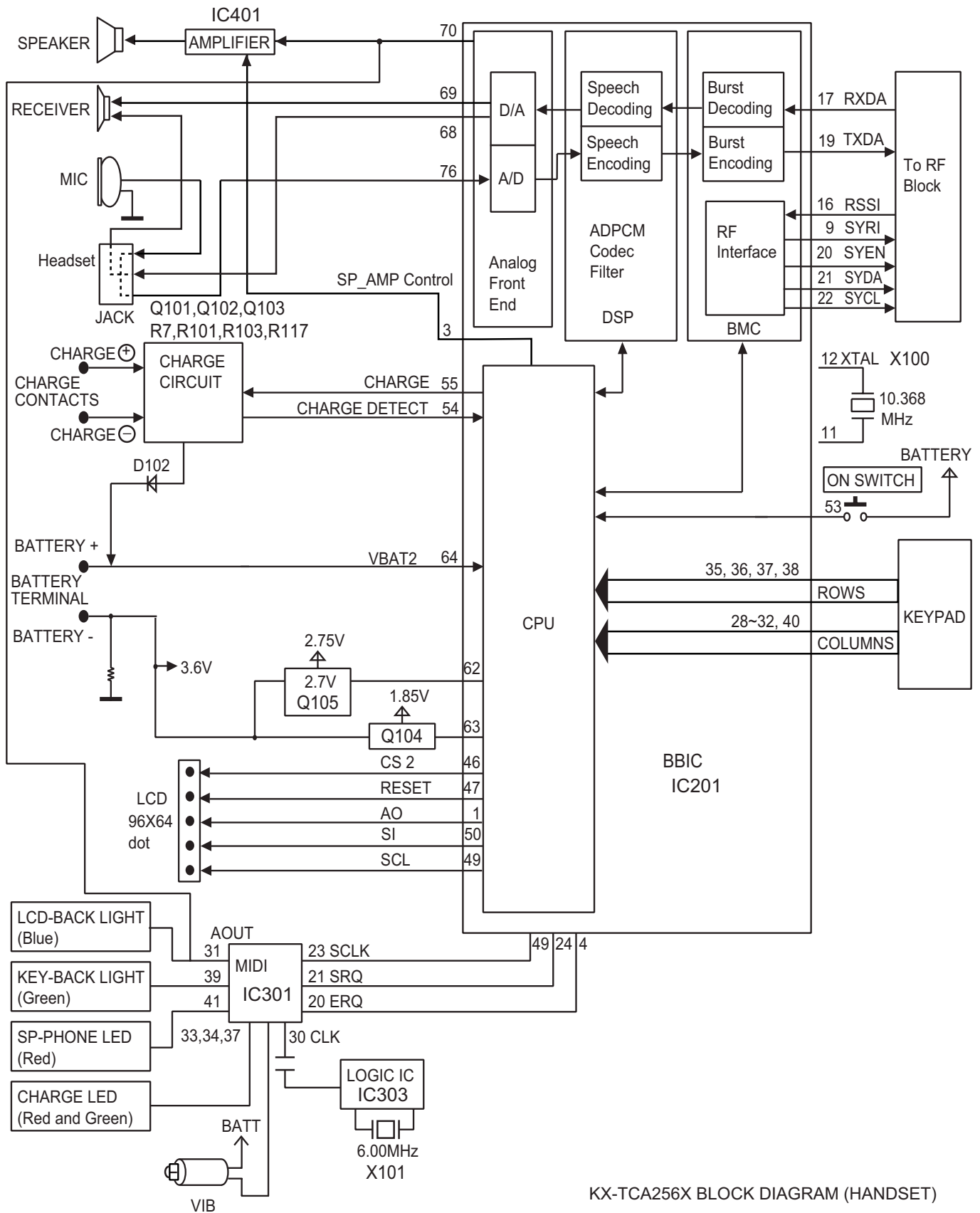
1. Danger of explosion if battery is incorrectly replaced.
2. Replace only with the same or equivalent type recommended by the manufacturer.
3. Dispose of used batteries according to the manufacture's Instructions.

3 Specifications

	Handset	Charger Unit
Standard:	DECT= (Digital Enhanced Cordless Telecommunications) GAP= (Generic Access Profile)	
Power Source:	Rechargeable Ni-MH battery	AC Adaptor
Power Consumption		Standby: Approx. 270W Maximum: Approx. 270W
Number of Channels:	120 Duplex Channels	
Frequency Range:	1.88GHz to 1.9GHz	
Duplex Procedure:	TDMA (Time Division Multiple Access)	
Battery Life, Handset (if batteries are fully charged):	Stand-by: Up to 120 hours (Ni-MH) Talk: Up to 17 Hours (Ni-MH)	
Channel Spacing:	1728kHz	
Bit rate Spacing:	1152kbit/s	
Operating Conditions:	5~40 °C, 20~80% relative air humidity (dry)	
Modulation:	GFSK= (Gaussian Frequency Shift Keying)	
RF Transmission Power:	approx. 250mW	
Voice Coding:	ADPCM 32 kbit/s	
Operation Range:	Up to 300 m outdoors, Up to 50 m indoors	
Dimensions (D x W x L):	123 mm x 45 mm x 22 mm	78 mm x 78 mm x 59 mm
Weight:	about 120g	about 108g

4 Technical Descriptions

4.1. Block Diagram (Handset)



KX-TCA256X BLOCK DIAGRAM (HANDSET)

4.2. Circuit Operation (Handset)

4.2.1. Outline

Handset consists of the following ICs as shown in **Block Diagram (Handset)** (P.6).

- DECT BBIC (**Base Band IC**): IC201
 - All data signals (forming/analyzing ACK or CMD signal)
 - All interfaces (ex: Key, Detector Circuit, Charge, DC/DC Converter, LCD)
Include EEPROM and Flash memory
EEPROM stores the temporary operating parameters (for RF, etc.)
- AMP: IC401
 - Single OP_AMP for SP
- MIDI: IC301
 - 16-Tone 32-Poly PCM Sound Generator
 - Port (LED direct driver with PWM)
- RF Block
 - IC601
PLL Oscillator
Detector
Compress/Expander
Amplifier for reception
 - IC602
Amplifier for transmission
Power control

4.2.2. Power Supply Circuit/Reset Circuit

Circuit Operation:

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

BATTERY(3.5V~4.2V: Battery+) → Q104 (1.8V)
→ Q105 (2.7V)

The Reset signal generates IC201 (78) and 1.8V.

4.2.3. Charge Circuit

Circuit Operation:

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

DC+(9V~10V) → IC601(6) → IC601(2) → L601 → JT601(Charger) → JT101(Handset) → L101 → Q101 → D102 → BATTERY+... BATTERY- → R115 → GND → L102 → JT102(Handset) → JT602(Charger) → R616, R617, R618, R619 → 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 Q101 of Handset.

4.2.4. Battery Low/Power Down Detector

Circuit Operation:

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

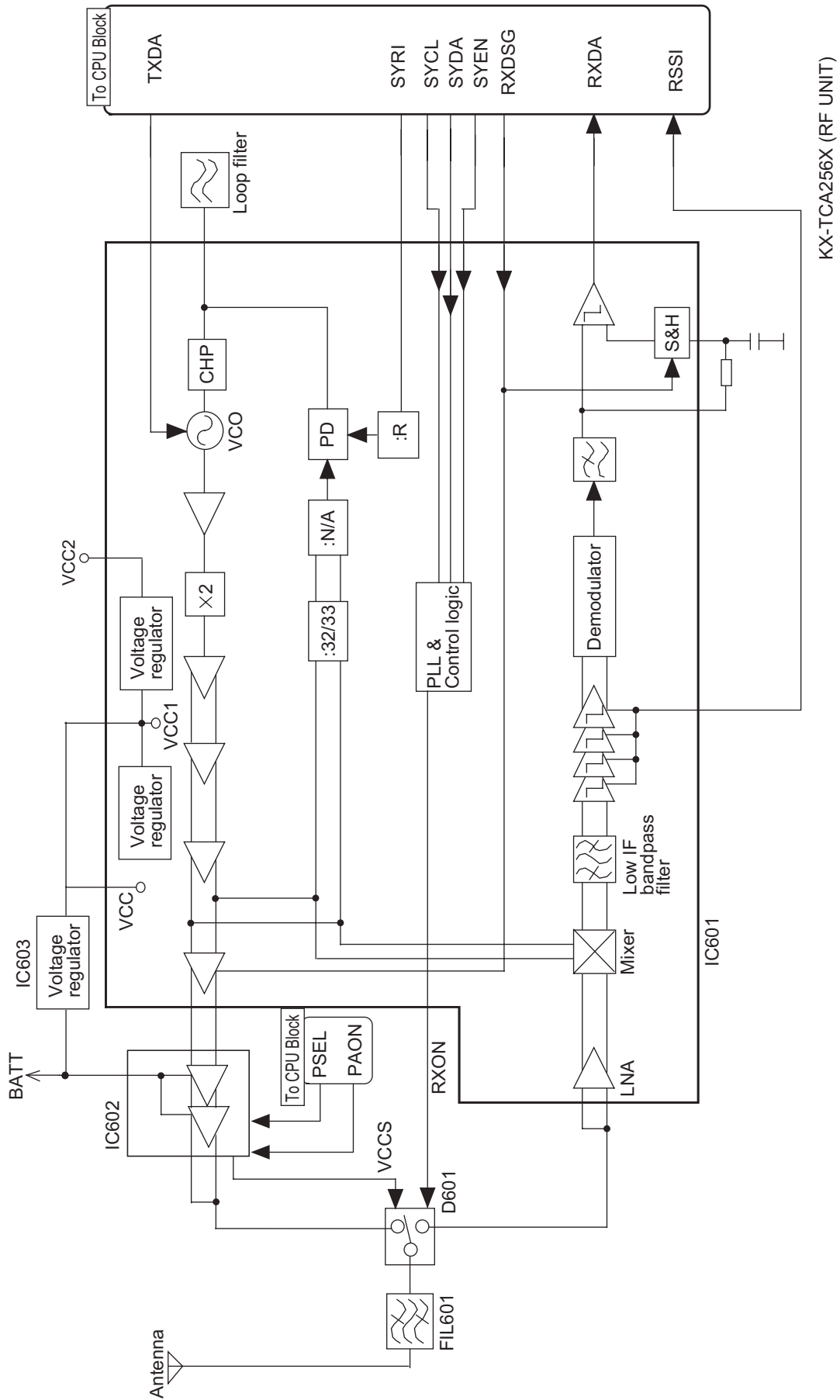
The detected voltage is as follows:

- Battery Low
Battery voltage: $V(\text{Batt}) \leq 3.5V \pm 50mV$
The BBIC detects this level and "🔋" starts flashing.
- Power Down
Battery voltage: $V(\text{Batt}) \leq 3.3V \pm 50mV$
The BBIC detects this level and power down.

4.2.5. Speakerphone and Headset Jack

The hands-free loudspeaker at CN401(1) and CN401(2) is used to generate the ring alarm. IC401 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 70 of the BBIC. 2.5mm headset jack is also available.

4.3. Block Diagram (RF Unit)



4.4. Circuit Operation (RF Unit)

To measure the charge-current, R616-619 transfer the current to a voltage.

When the charge-current is 200mA, the voltage is 0.05V.

IC602 amplifies the voltage to 24.5time, then the output voltage is $24.5 \times 0.05 = 1.225V$.

IC601 is DC/DC convertor. This IC adjusts CII to 1.25V.

Then the charge current is adjusted to 204mA.

When charging is completed, the BBIC (IC201) of the portable station set the Q103-Base to "High", then Q102 is turned off. As a result, the charging current is stopped.

4.5. Signal Route

To measure the charge-current, R616-619 transfer the current to a voltage.

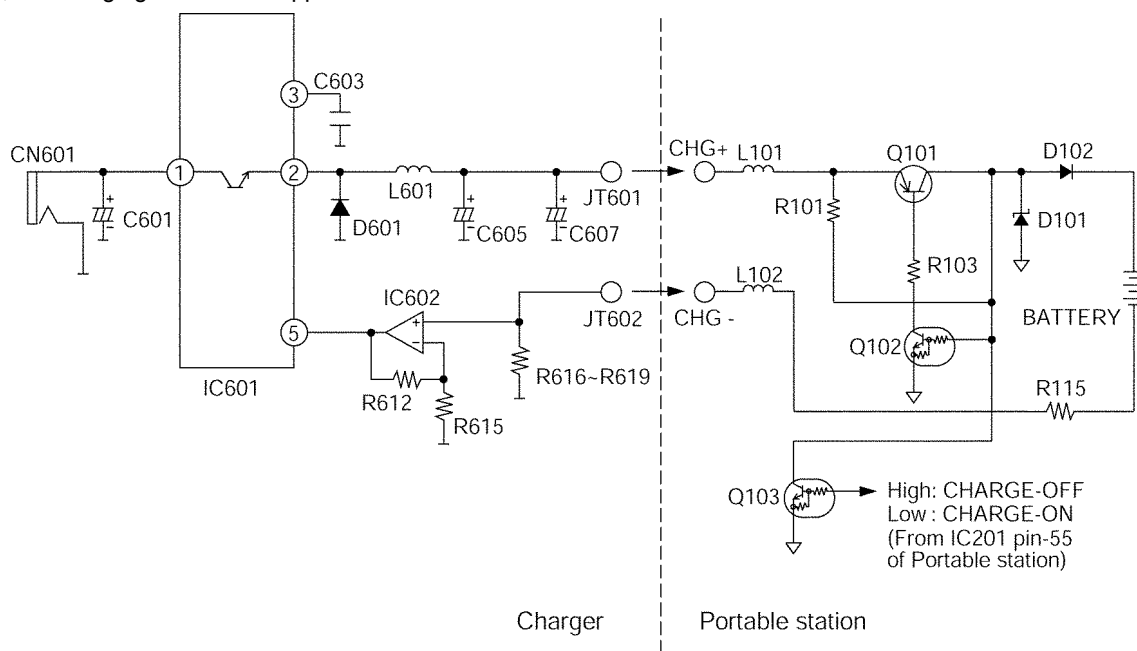
When the charge-current is 200mA, the voltage is 0.05V.

IC602 amplifies the voltage to 24.5time, then the output voltage is $24.5 \times 0.05 = 1.225V$.

IC601 is DC/DC convertor. This IC adjusts CII to 1.25V.

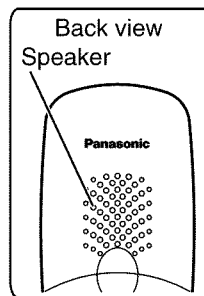
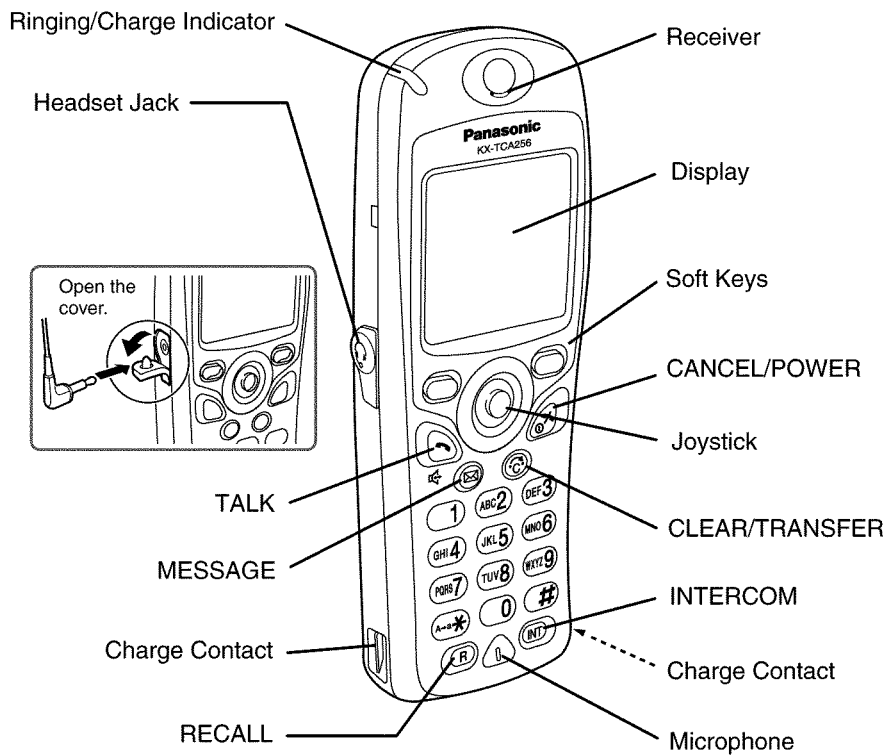
Then the charge current is adjusted to 204mA.

When charging is completed, the BBIC (IC201) of the portable station set the Q103-Base to "High", then Q102 is turned off. As a result, the charging current is stopped.



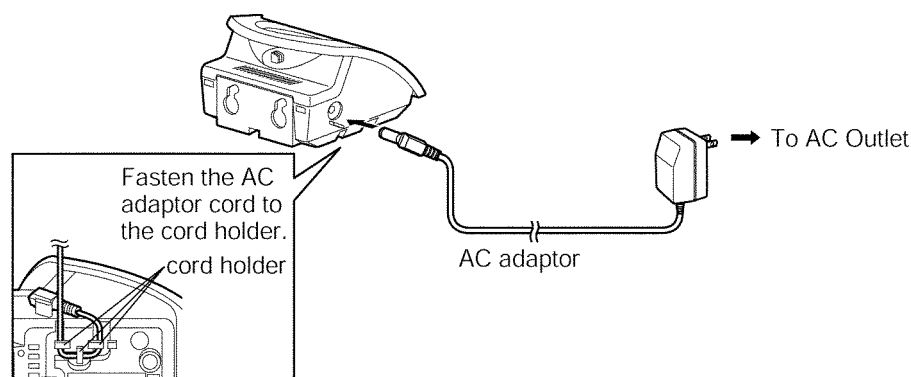
5 Location of Controls and Components

5.1. Location of Controls (Handset)



6 Installation Instructions

6.1. Connection

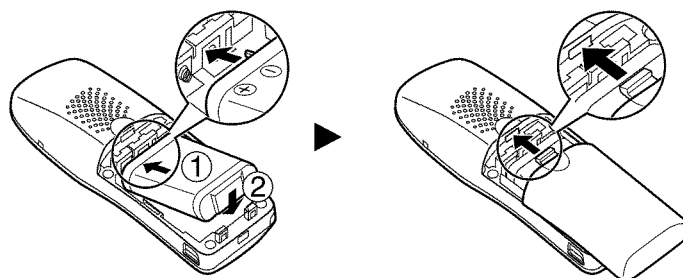


- Use only the included Panasonic AC adaptor (KX-TCA1-2).

6.2. Battery

6.2.1. Battery Installation

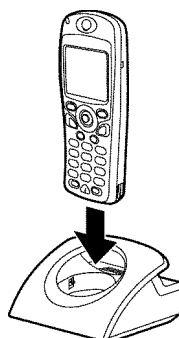
Insert the batteries as shown. Close the cover as indicated by the arrow.



6.2.2. Battery Charge

At the time of shipment, the battery is not charged.

Please charge the battery for more than 5.5 hours before initial use.



- When the battery has been completely charged, the charge indicator will change from red to green.
- It is normal for the PS and charger to feel warm while the battery is charging.
- Keep devices sensitive to magnetic fields away from the charger.

6.2.3. Battery Information

After your Panasonic battery is fully charged [at 25°C]:

Operation	Operating Time
While in use (TALK)	17 hrs approx.
While not in use (Standby)	270 hrs approx.

- Battery charge may be shortened depending on usage conditions and ambient temperature.
- The batteries cannot be overcharged.
- The batteries will drain even while the unit is "OFF".
- The PS can receive calls while charging.
- Battery consumption increases when the PS is used out of range. If "Y" flashes, power off the PS.
- **Clean the handset and the charger contacts with a soft, dry cloth once a month. Clean more often if the unit is subject to grease, dust or high humidity. Otherwise the battery may not charge properly.**
- Read "Important Notice Concerning the Correct Use and Charging of Ni-MH Batteries."

6.2.4. Low Battery Warning

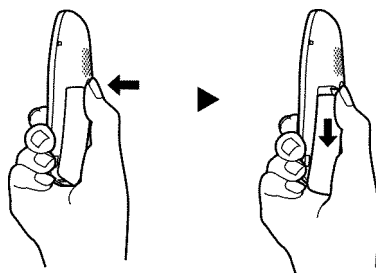
The batteries needs to be charged when "■" flashes or the alarm sounds every one minute during a conversation.*

* If the low battery warning occurs during a conversation, you can continue the call for a few minutes, then the call will be disconnected automatically.

6.2.5. Replacing the Batteries

If "■" flashes after a few telephone calls even when the batteries have been fully charged, it is time to replace the batteries with new ones.

1. Turn the power off to prevent memory loss.
2. Press the notch on the cover firmly and slide it as indicated by the arrow.



3. Open the cover and replace the battery.
4. Close the cover and charge the handset for more than 5.5 hours.

Please replace with Panasonic battery only.





























- Please order part number N4HHGMB00007.

If you replace the battery before the low battery warning appears, the battery strength icon may display an inaccurate reading. In this case, use the PS as normal with the new battery installed. When the low battery warning is displayed, charge the battery for more than 5.5 hours. The battery strength icon will then display a correct reading.

7 Operation Instructions

7.1. Soft Key Display

Icons and information shown on the display will vary depending on the state of use. To select an item shown on the display, press the corresponding soft buttons.

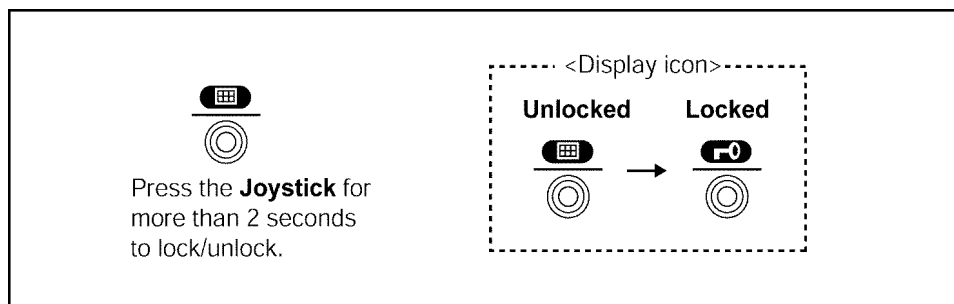
	Opens the Handset Phonebook.		Displays the caller information stored in the Handset Phonebook while receiving a call.
	Opens the main menu.		Displays the caller information stored in the system while receiving a call.
	Opens the function menu.		Used to clear the memo alarm display setting, or enter an X when storing the "Line Access CD".
	Displays the outgoing call log.		Used to select an item when in setting mode.
	Used to confirm the entry.		Displayed when in ABC (Alphabetic) character entry mode.
	Turns the ringer off.		Displayed when in 0-9 (Numeric) character entry mode.
	Opens the PBX System Phonebook.		Displayed when in ABΓ (Greek) character entry mode.
	Opens the PBX Extension Phonebook.		Displayed when in AAA (Extended 1) character entry mode.
	Opens the incoming call log.		Displayed when in SSS (Extended 2) character entry mode.
	Opens the incoming call log group.		Displayed when in key lock, and used to unlock the dialling buttons.
	Displays the next screen.		Used to search for an item in the Phonebook alphabetically.
	Clears digits or characters.		Used to place a call on hold.
	Inserts a dialling pause.		Used to establish a multiple-party conversation.
	Returns to the previous screen.		
	Used to set the time for memo alarm.		

7.2. Settings Menu Chart (Handset)

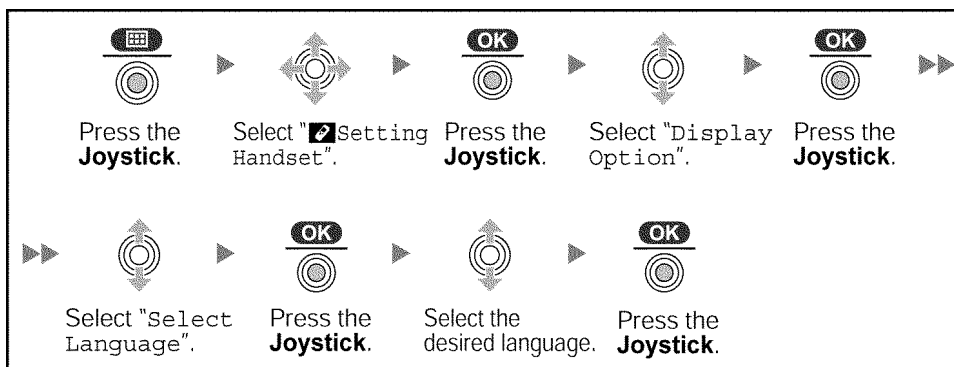
1st Menu	2nd Menu	3rd Menu
Setting Handset	Memo Alarm	
	Ringer Option	Ringer Volume
		Vibration
		EXT Ringer Type
		INT Ringer Type
		Group Ring Type
		Private Ring
		Charger
	Tone Option	Key Tone
		Range Warning
	Display Option	Standby Display
		Select Language
		LED Colour
		Private Colour
		Category Name
		Caller ID Disp
		LCD Contrast
		Guidance
		Flex Base Set
		Flex Name Edit
	Call Option	Hot Line No.
		Hot Line Mode
		Line Access CD
	Registration	Register H/set
		Cancel Base
	Select Base	
	Other Option	Change H/S PIN
		Auto Talk
		Reset Handset
		Any Key Answer
		Auto Answer
		Auto Ans Delay
		Flex Key Edit

7.3. Key Lock

You can lock the dialling buttons while the PS is in idle status.



7.4. Selecting the Display Language



- When set to "Auto", the language settings of the Business Telephone System will be used automatically.
- The display language of both the PS and Business Telephone System can be selected, and both should be set to the same language. Refer to the Business Telephone System User manual for more details.

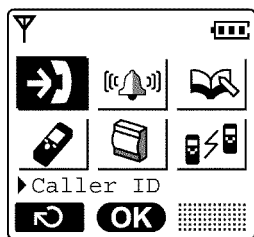
7.5. DISPLAY

7.5.1. Display Icons



- Within range of a Cell Station
- Out of range, No registration
- Intercom Indicator
- Off-hook Status
- Message Waiting
- Phonebook Mode
- Battery Strength
- Hot Line ON
- Ringer Volume OFF
- Vibration
- Meeting Mode
- Call Forwarding
- Do Not Disturb

7.5.2. Main Menu-while in standby mode


Caller ID:

Displays the incoming call log.


Ringer Option:

Accesses to the "Ringer Option".


New Phonebook:

Stores a new item in the Handset Phonebook.


Setting Handset:

Accesses to the "Setting Handset".

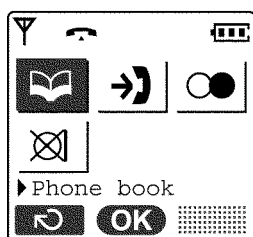

PBX Program:

Enters the PBX programming mode.


Walkie-Talkie:

Sets or turns on/off the Walkie-Talkie mode.

7.5.3. Sub menu-while in off-hook/during a conversation


Phone book:

Accesses to the Handset Phonebook.


Caller ID:

Displays the incoming call log.

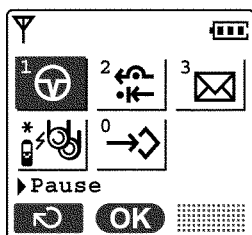

Redial:

Redials the last dialled number.


Mute:

Turns the microphone on/off.

7.5.4. PBX Feature Menu


Pause:

Inserts a dialling pause.


FWD/DND:

Used to change Call Forwarding or Do Not Disturb settings.


Message:

Used to leave a message waiting indication or call back the party who left you a message waiting indication.


Search Wave:

Searches for the strongest radio signal coming from the Cell Station.


PBX Program:

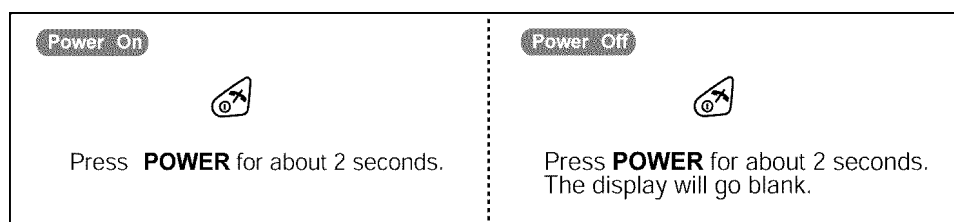
Enters the PBX programming mode.

Has the same function as "  **PBX Program**" found in the main menu.

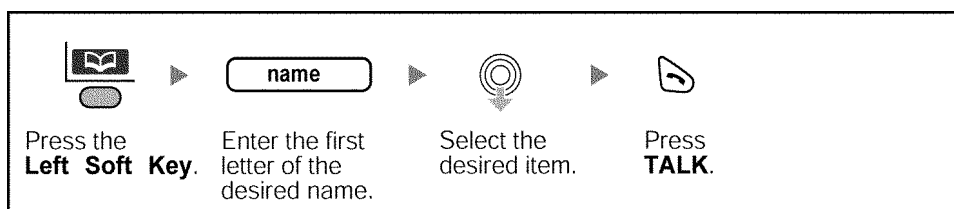
7.5.5. Troubleshooting

Problem	Description and Solution
The PS does not work.	<ul style="list-style-type: none"> • The battery is drained. ➔ Charge the battery fully. • The PS has been cancelled or the PS has not been registered. ➔ Consult your dealer. • The power is OFF. ➔ Turn it ON.
The PS does not ring.	<ul style="list-style-type: none"> • Ringer volume is set to "off" ➔ Adjust the ringer volume level.
You cannot make/receive a call.	<ul style="list-style-type: none"> • The PS is out of range or the Cell Station (CS) is busy. ➔ Move closer to the CS or try again later. • The radio channel is busy or a radio communication error occurred. ➔ Try again later.
You cannot dial.	<ul style="list-style-type: none"> • The number which you dialled is restricted by the Business Telephone System. ➔ Consult your dealer. • The key lock mode is ON. ➔ To cancel the mode, press the Joystick for about 2 seconds. • The radio channel is busy or a radio communication error occurred. ➔ Try again later.
Noise is frequently heard.	<ul style="list-style-type: none"> ➔ Set the PS and CS away from other electrical appliances. ➔ Move closer to the CS.
"CS BUSY" is displayed.	<ul style="list-style-type: none"> • The Cell Station is busy. ➔ Try again later.
"PS Not Connected" is displayed.	<ul style="list-style-type: none"> • The called PS is out of range or the CS is power off. ➔ Try again later.
The PS stops working during operation.	<ul style="list-style-type: none"> ➔ Turn the power OFF and ON, then try again. ➔ Reinsert the batteries and try again.
Two short beeps are heard during a conversation.	<ul style="list-style-type: none"> • The radio signal is weak. ➔ Move closer to the CS.

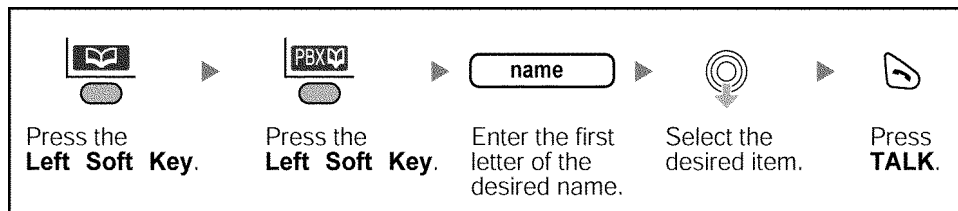
7.5.6. Power ON/OFF



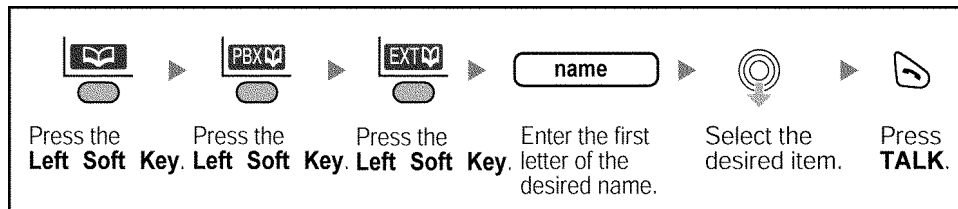
7.5.7. Using the Handset Phone book



7.5.8. Using the PBX System Phone book



7.5.9. Using the PBX Extension Phone book

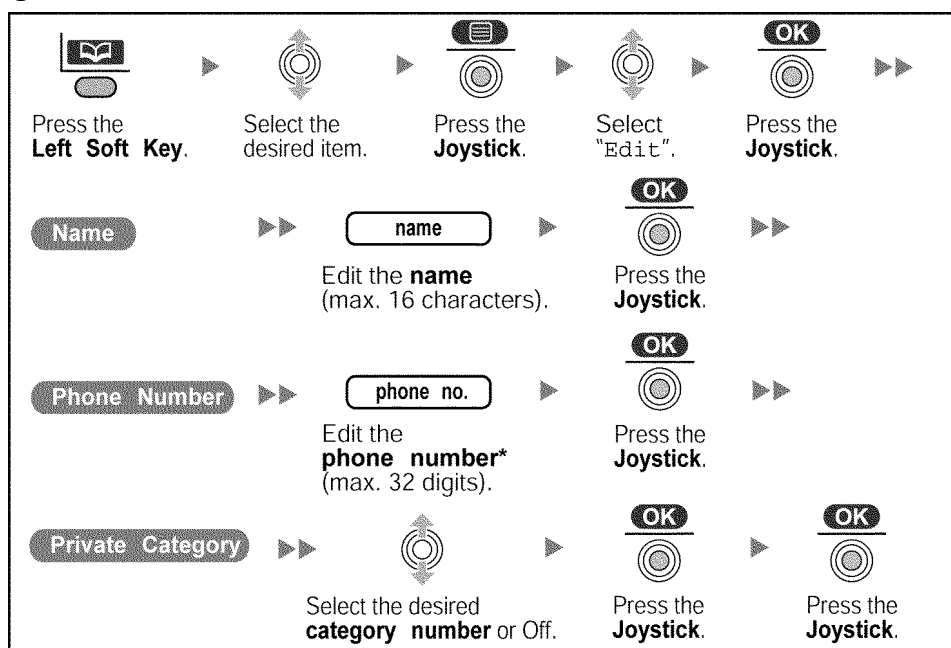


7.5.10. Character Mode Table

Buttons	ABC (Alphabet)	0-9 (Numeric)	ABΓ (Greek)	AÄÅ (Extended 1)	SŠŠ (Extended 2)
①	Space # & ' () * , - . / 1	1	Space # & ' () * , - . / 1		
②	ABC 2	2	ABΓ 2	AAÄÅÄÄÄÆBCÇ 2	AAÄÅBCČČ 2
	abc 2			aäåãäääæbcç 2	aäåAbcČč 2
③	DEF 3	3	ΔEZ 3	DEĚĚĚĚĚF 3	DĎĚĚĚĚF 3
	def 3			deěėėėėēf 3	dďeėĚēf 3
④	GHI 4	4	HΘI 4	GĜHIIĪĪĪĪI 4	GHIÍ 4
	ghi 4			gĝhīīīīīīīi 4	ghīí 4
⑤	JKL 5	5	KΛM 5	JKL 5	JKLŁŁŁ 5
	jkl 5			jkl 5	jklŁŁŁ 5
⑥	MNO 6	6	NΞO 6	MNÑOÒÓÔÕÖø 6	MNŇŇOÓÓŎŎ 6
	mno 6			mññoóóôõöø 6	mñŇňoóóŏŏ 6
⑦	PQRS 7	7	ΠΡΣ 7	PQRSŞß 7	PQRŘŘŠŠŠ 7
	pqr 7			pqrşşß 7	pqrŘřššš 7
⑧	TUV 8	8	TYΦ 8	TUÚÚÚŮŮŮV 8	TŤUÚÚŮŮŮV 8
	tuv 8			tuúúúůůův 8	tťuúúůůův 8
⑨	WXYZ 9	9	XΨΩǾ 9	WŴXYŶZ 9	WXYŶŶZŽŽŽ 9
	wxyz 9			wŵxyŷz 9	wxyŷŷzŽŽŽ 9
⑩	Space 0	0	Space 0		


- The following letters are not available. They will be replaced by the uppercase (or lowercase) version of the same letter.
ąćčďęłíĺńøřšśšťwÿŶžžž
- Press (✱) to change between uppercase and lowercase.


7.5.11. Editing



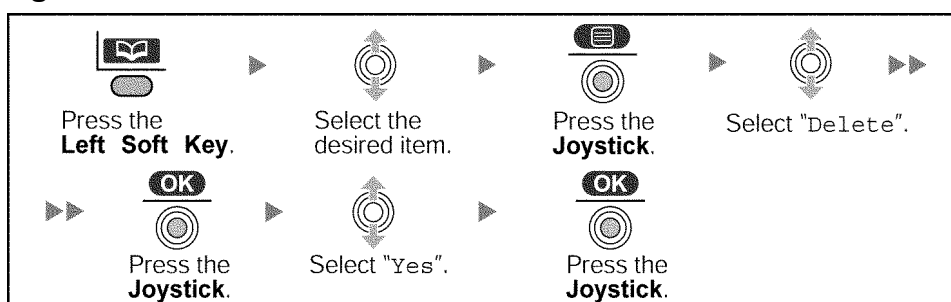
• * The valid digits are "0" through "9", "✖", "#", PAUSE.

• To change a character or digit, move the joystick  to highlight it, press  to delete it, then enter the new character or digit.

• To clear an entire line, press and hold .

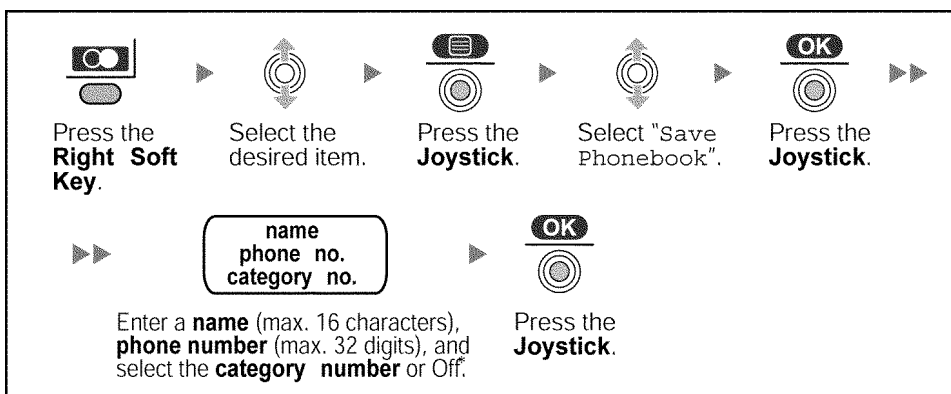
• To move the cursor to the left or right, move the joystick  or , respectively.

7.5.12. Deleting




7.5.13. Storing an item in the Handset Phone book

7.5.13.1. Using the Outgoing Call Log

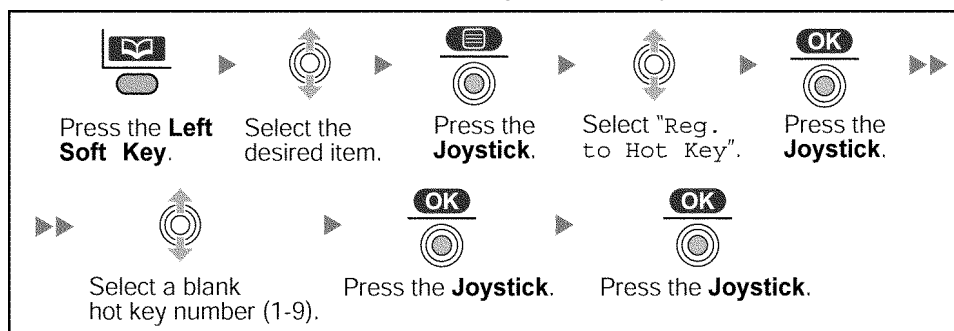




- * Press  to confirm each entries.
- When storing an outside phone number, the line access number will be stored automatically. The line access number must be identical to the PS's "Line Access CD" setting (Call Option).

7.5.17. Hot Key Dial

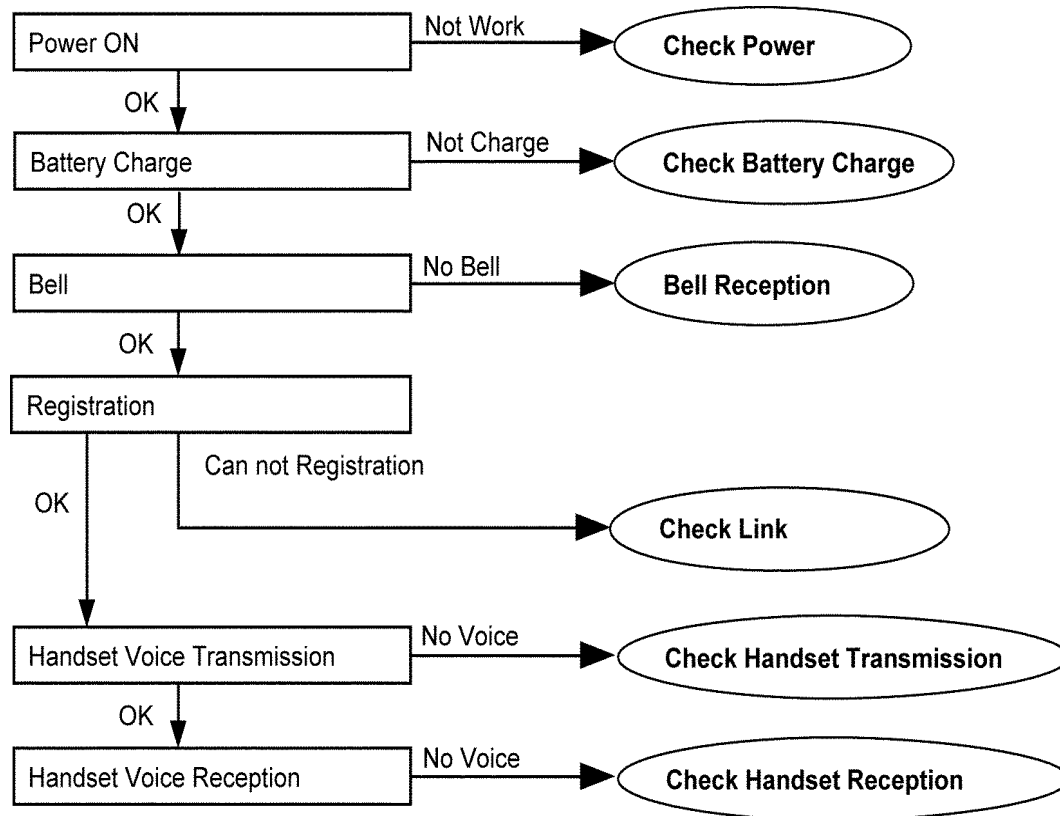
The phone numbers stored in the handset phone book can be assigned as hot key.



- A "✓" will be displayed next to hot key numbers which have a phone book item registered to them.

8 Troubleshooting Guide

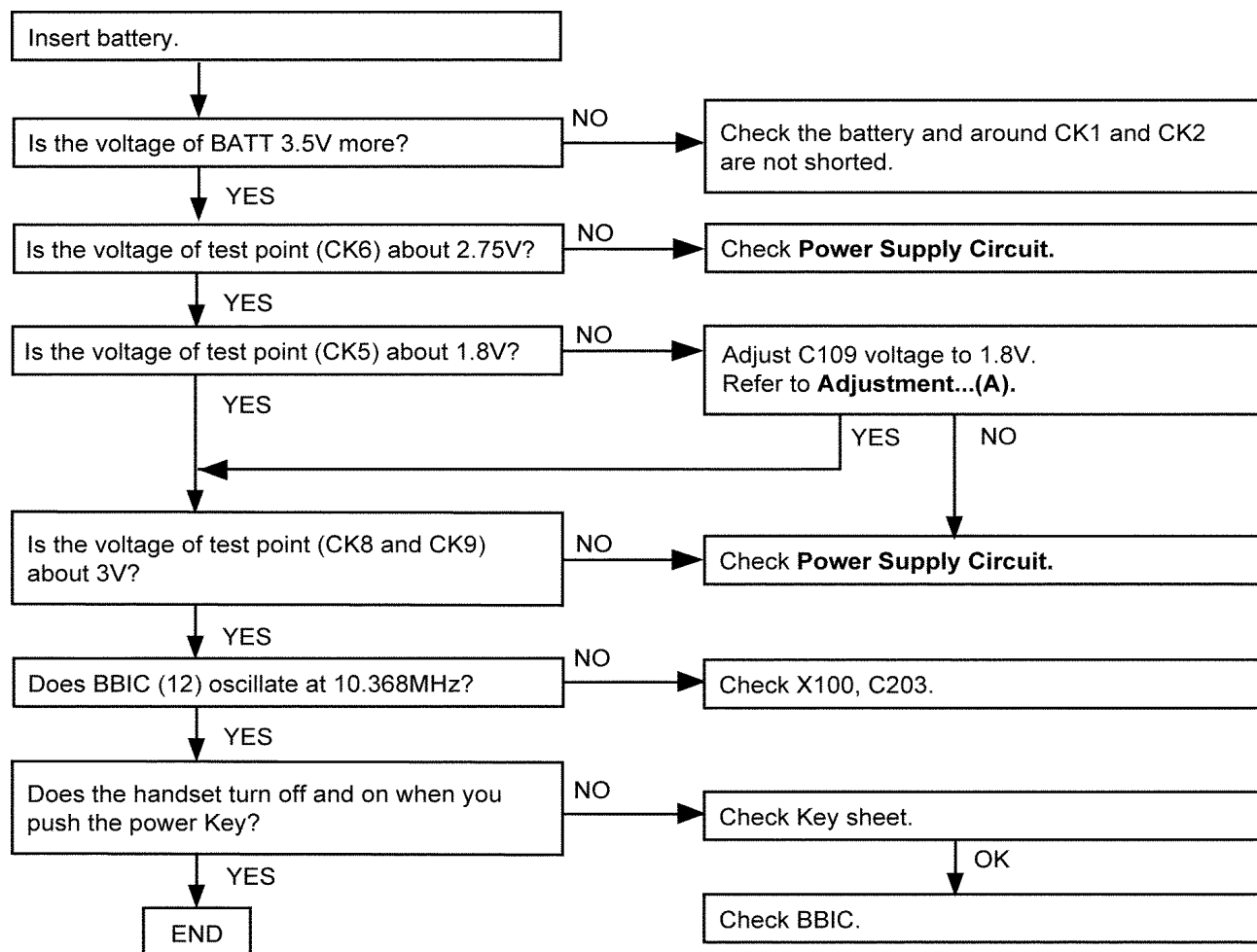
Flow Chart



Cross Reference:

- Check Power (Handset)** (P.23)
- Check Battery Charge (Handset)** (P.24)
- Bell Reception (Handset)** (P.27)
- Check Link (Handset)** (P.26)
- Check Handset Transmission** (P.27)
- Check Handset Reception** (P.27)

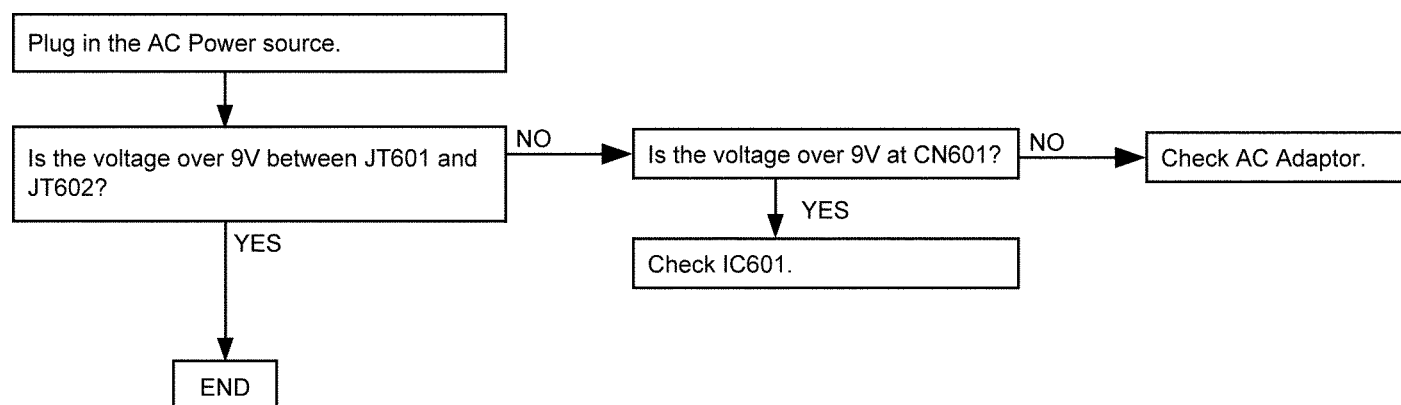
8.1. Check Power (Handset)



Cross Reference
Power Supply Circuit/Reset Circuit (P.7)

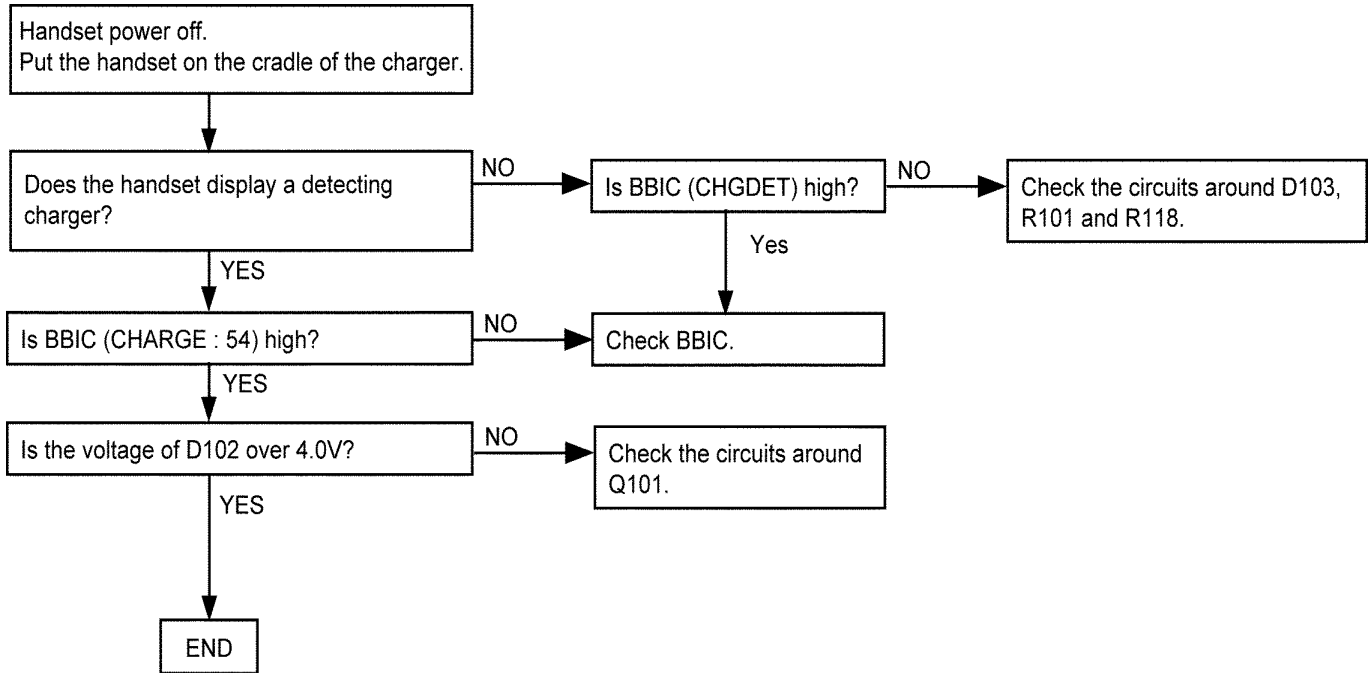
Note:
 BBIC is IC201.

8.2. RF Unit



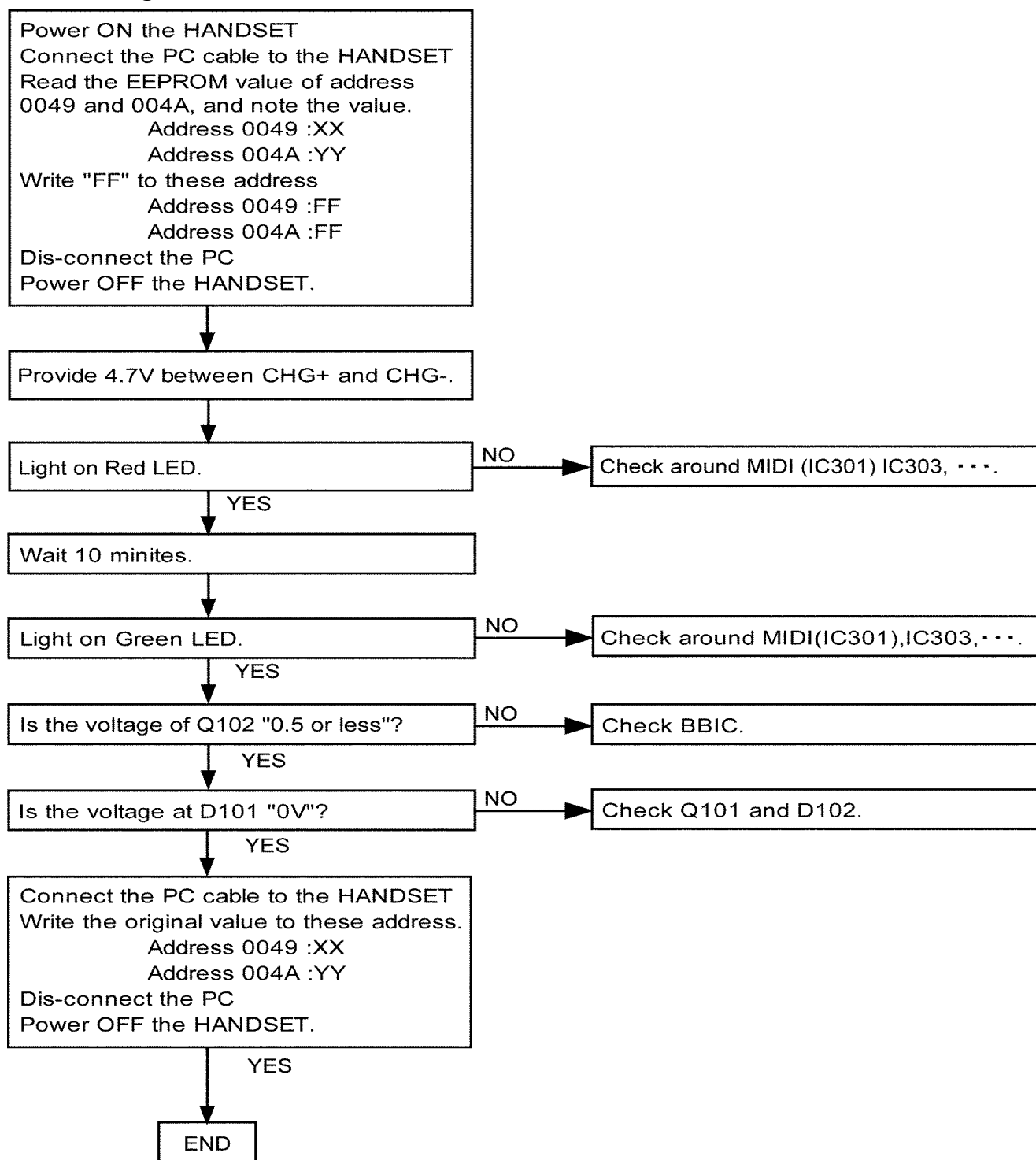
Cross Reference:
Circuit Operation (RF Unit) (P.9)

8.3. Check Battery Charge (Handset)



Note:
BBIC is IC201.

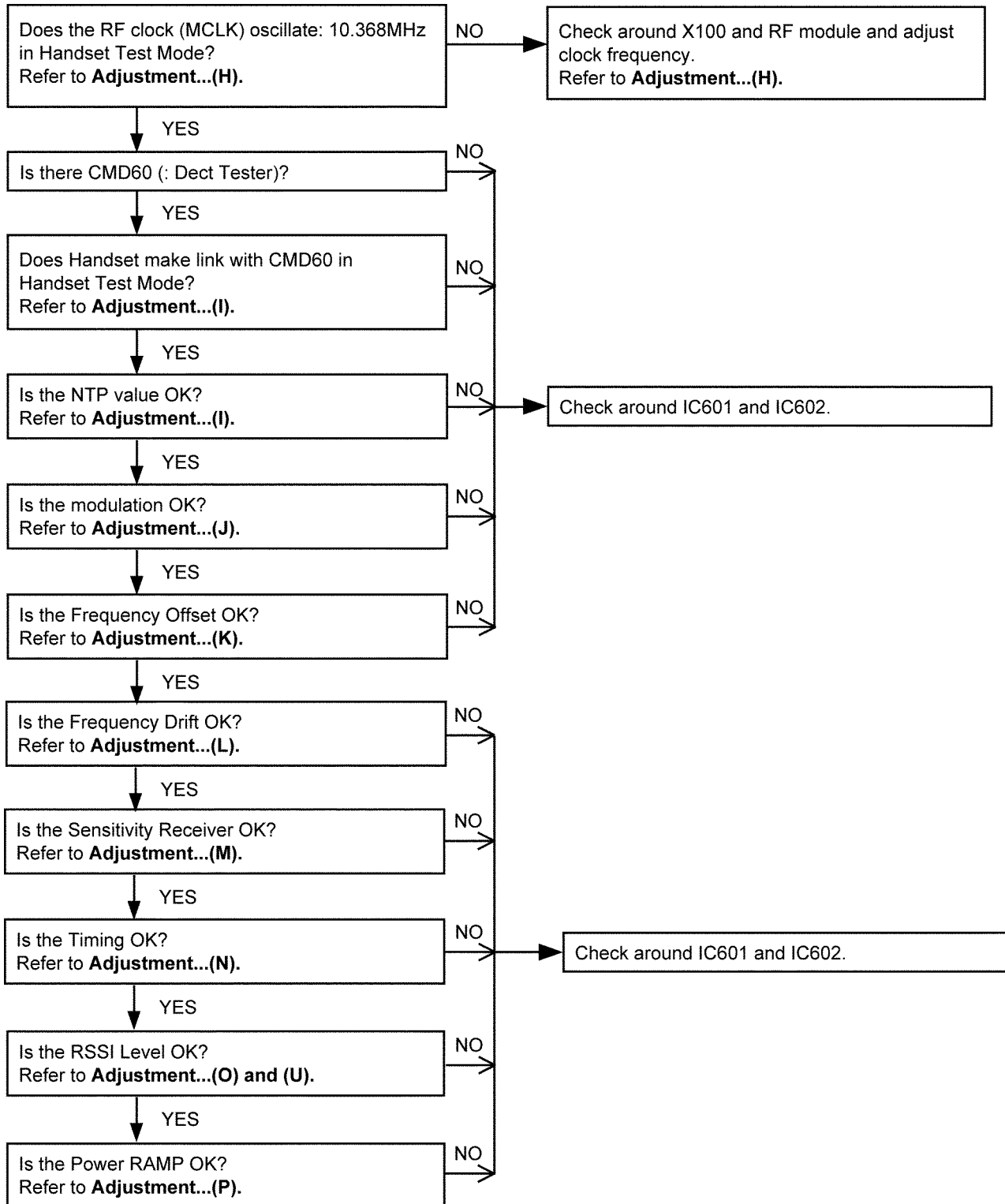
8.3.1. Charge OFF



Note:

BBIC is IC201.

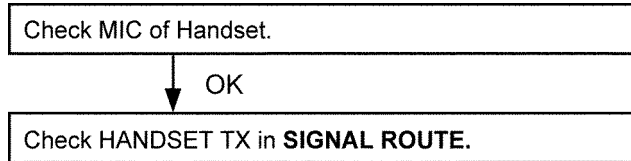
8.4. Check Link (Handset)



Cross Reference

Adjustment (Handset) (P.36)

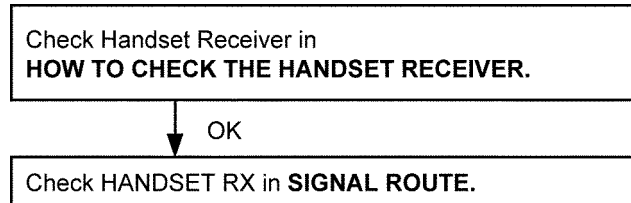
8.5. Check Handset Transmission



Cross Reference:

Signal Route (P.9)

8.6. Check Handset Reception

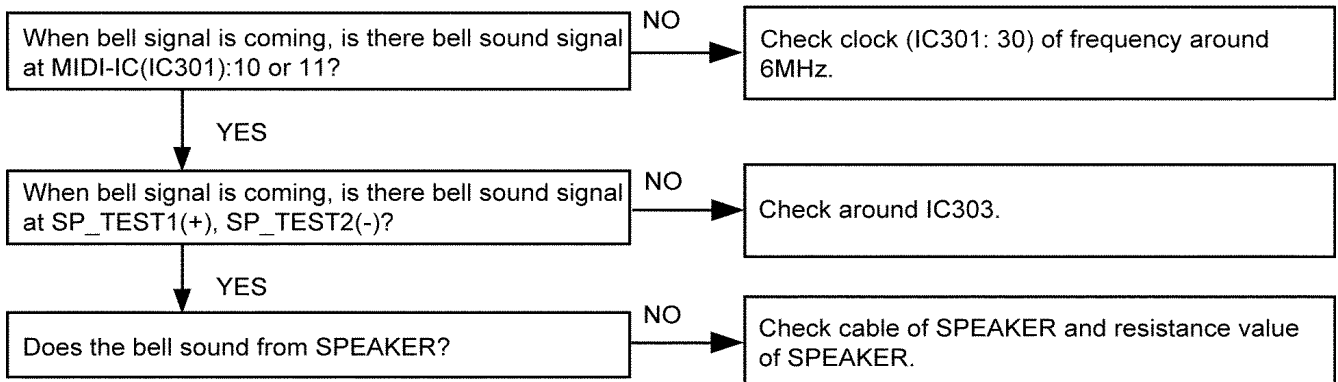


Cross Reference:

How to Check the Handset Receiver (P.42).

Signal Route (P.9)

8.7. Bell Reception (Handset)

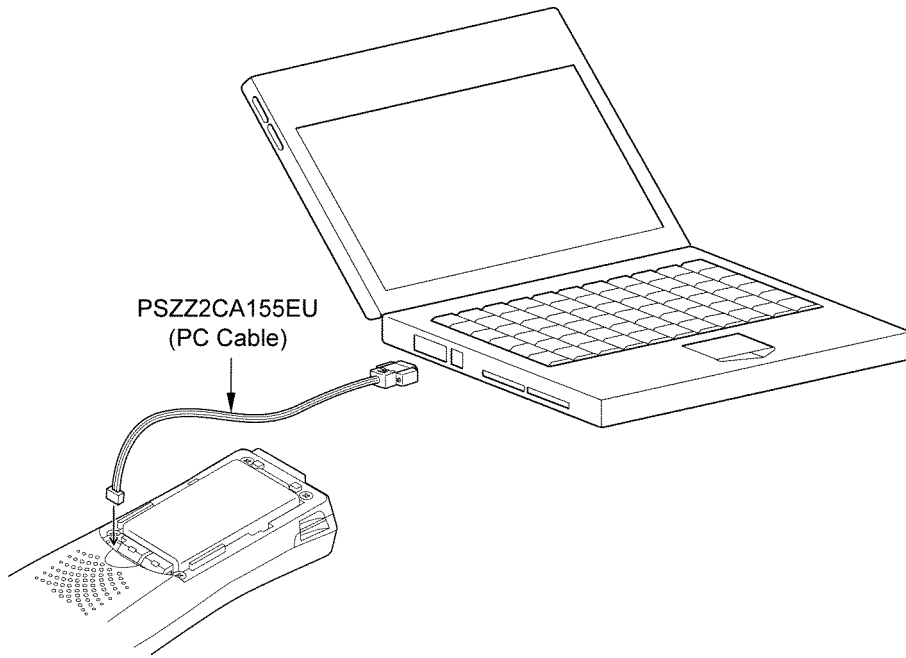


Cross Reference:

Check Link (Handset) (P.26)

How to Check the Handset Speaker (P.42)

9 Service Fixture & Tools



10 Disassembly and Assembly Instructions

10.1. Handset

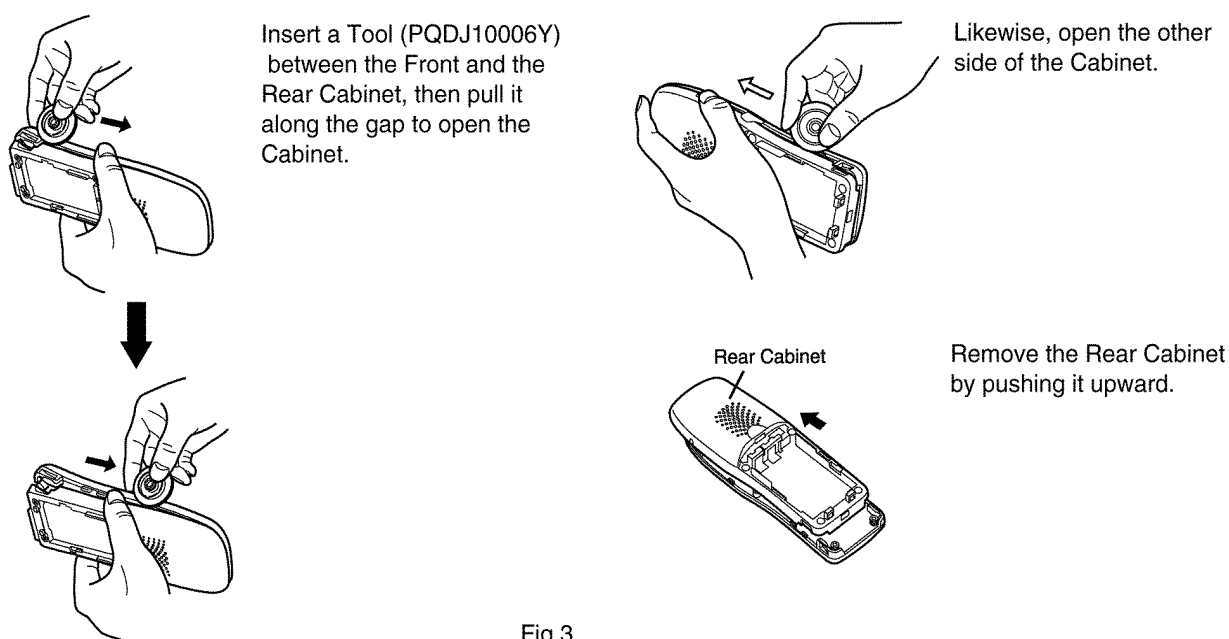
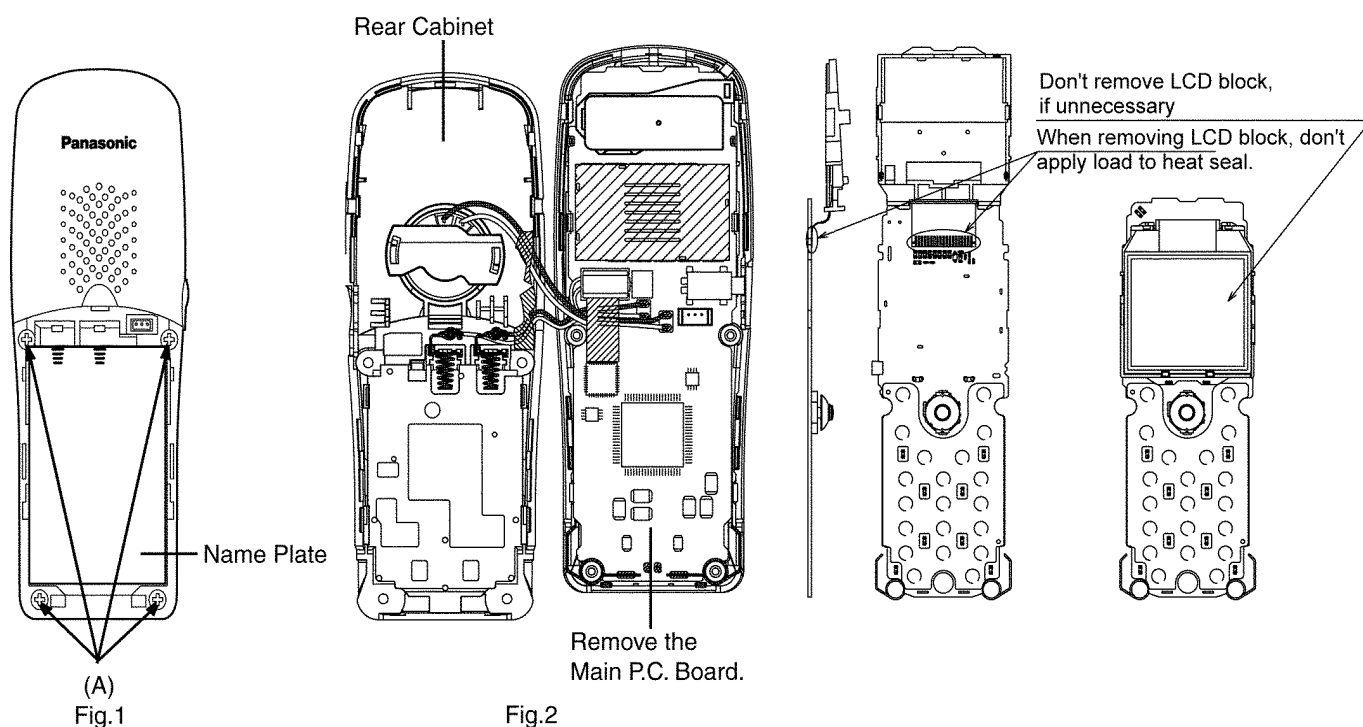


Fig.3

Shown in Fig.-	To Remove	Remove
1	Rear Cabinet	Screws (2 × 10).....(A) × 4
2		Follow the procedure.
3	Main P.C. Board	Main P.C. Board

10.2. Charger Unit

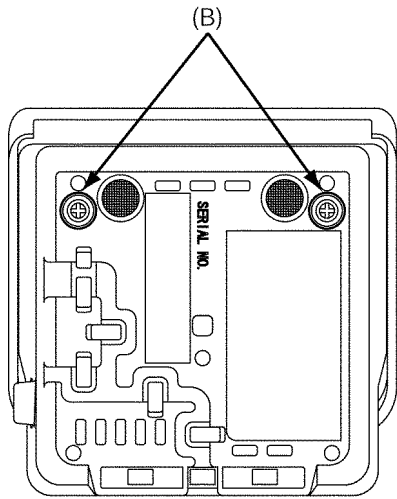


Fig. 4

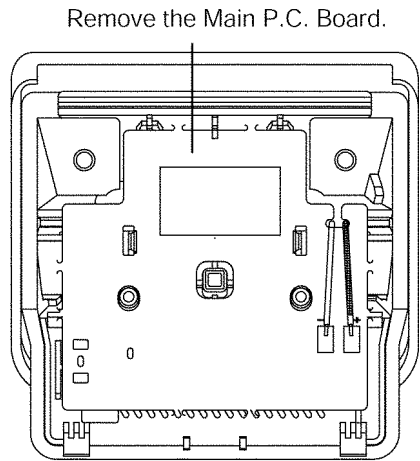


Fig. 5

Shown in Fig.-	To Remove	Remove
4	Lower Cabinet	Screws (2.6 × 14).....(B) × 2
5	Main P.C. Board	Main P.C. Board

11 Measurements and Adjustments

11.1. Check Procedure (Handset)

11.1.1. Preparation

11.1.1.1. Equipment Required

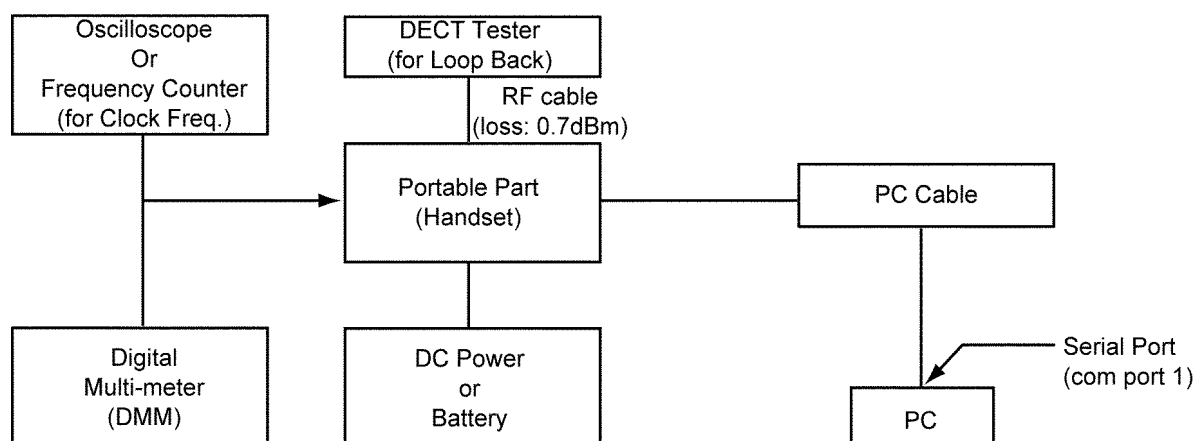
- DECT tester: Rhode & Scorers, CMD 60 is recommended.
- Frequency counter: it must be precise to be able to measure 1Hz (precision; ± 4 ppm).
Hewlett Packard, 53131A is recommended.
- DC power: it must be able to output at least 1A current under 3.8V for Handset, 9V for Tool.
- Digital multi-meter (DMM): it must be able to measure voltage and current.
- Oscilloscope

11.1.1.2. Tool and PC

- EEPROM serial Tool
Tool: PSZZ2CA155EU
- PC which runs in DOS mode.

11.1.2. PC Setting

11.1.2.1. Connections



11.1.2.2. 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:

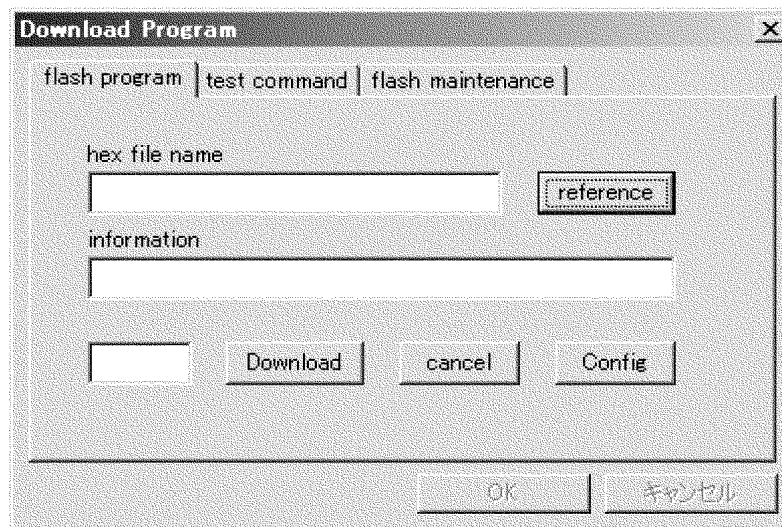
See the table below for frequently used commands.

Command name	Function	Example
ratepayer	Read the data of EEPROM	Type "ratepayer 00 00 FF", and the data from address "00 00" to "FF" is read out.
Siegfried	adjust Frequency of RFIC	Type "Siegfried an".
Glitch	Read checksum	Type "glitch".
Repairmen	write eeprom	Type "repairmen 01 23 45". "01 23" is address and "45" is data to be written.

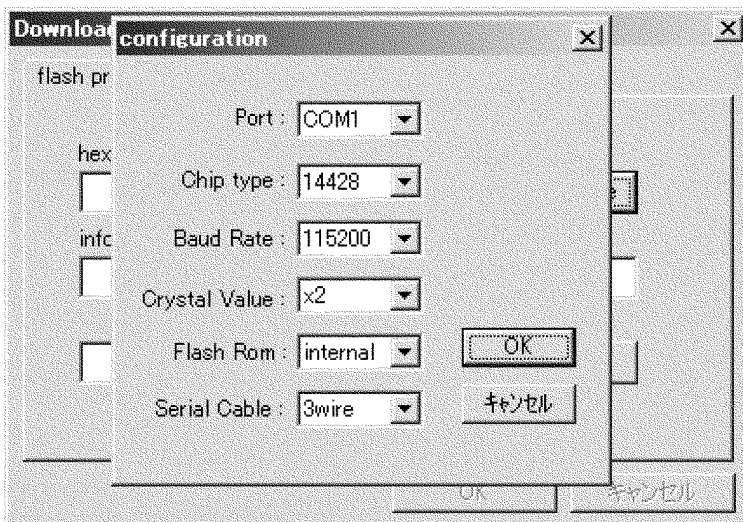
11.1.3. Download Manual

11.1.3.1. Step [1] Before Downloading (Configuration Setting)

[1]-(1) Execute "Flash Program.exe"



11.1.3.2. [1]-(2) Press Config



Select following desired item.

[Port]	select COM1/COM2/COM3/COM4
[Chip Type]	select "14428" only
[Baud Rate]	select "115200"
[Crystal Type]	select "x2"
[Flash Rom]	select "Internal" only
[Serial Cable]	select "3wire" only

[1]-(3) Press OK

Selected item will be stored.

Connect the download PC cable with selected come port (COM1 or COM2 or COM3 or COM4).

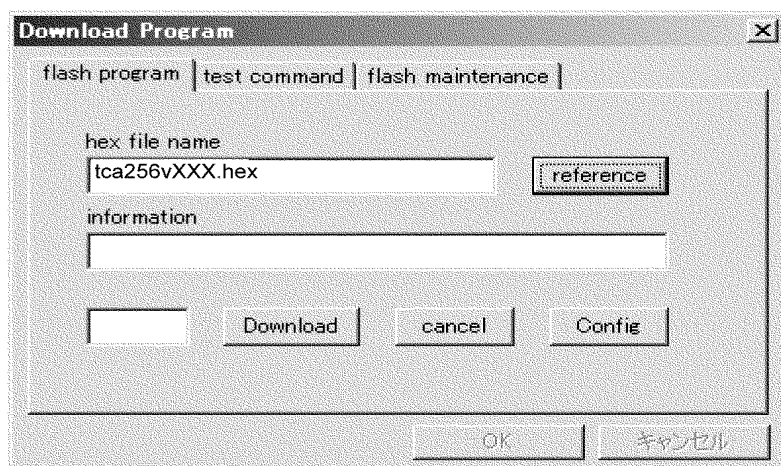
11.1.3.3. Step [3] Select Download file

[3]-(1) Download Program Main Menu

Push "Reference" to select the download file. (Download Filename tca256vXXX.hex) XXX=Version



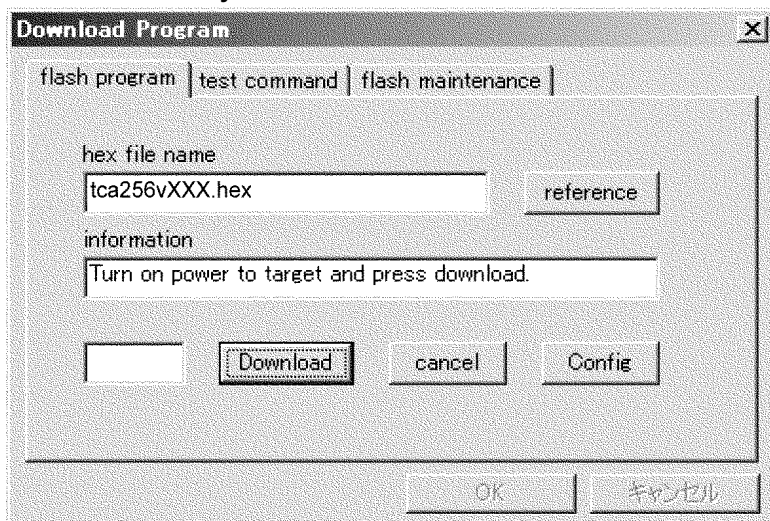
select file



Display shows selected file name.

11.1.3.4. Step [4] Download Start

[4]-(1) Click "download" key



Display turn to ready to download.

[4]-(2) Turn the power of target (TCA256) to [OFF]

(Keep pressing "POWER" key for while 2 seconds)

[4]-(3) Keep pressing "POWER" key until step [4]-(6)

This operation will not turn the power of target to on.

If target power turns on, check following item. Then try again from step [1]-(1).

(A) Check serial PC cable connection "PC" with "TCA256".

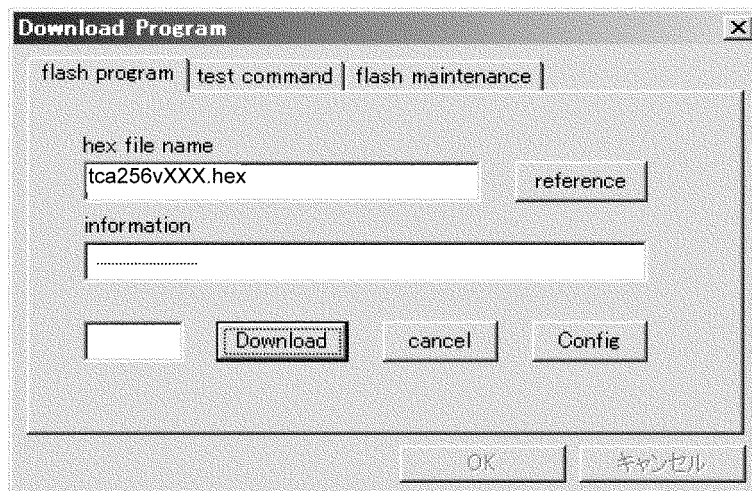
(B) Check Configuration. (Refer to Step [1]-(2))

(C) Check PC cable attachment of target.

[4]-(4) Click "Download"

Communicating PC with Target.

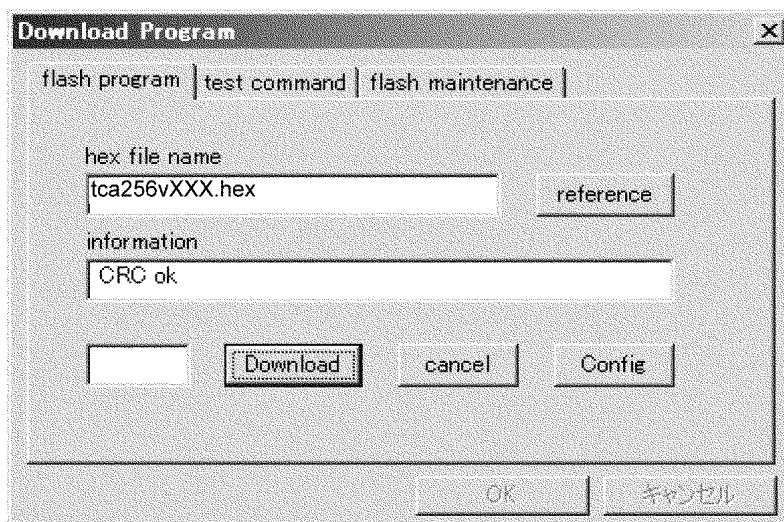
Don't release the "POWER" key in this step. If release the "OFF" key, downloading will be failed.



[4]-(5) Communication check "OK"

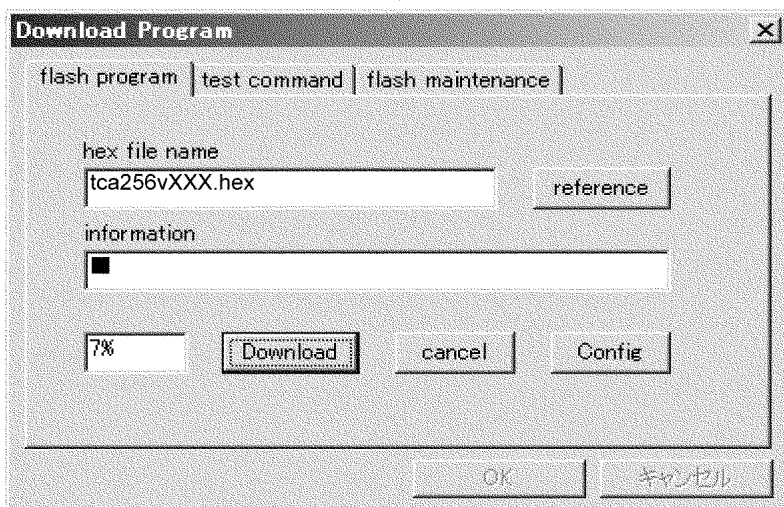
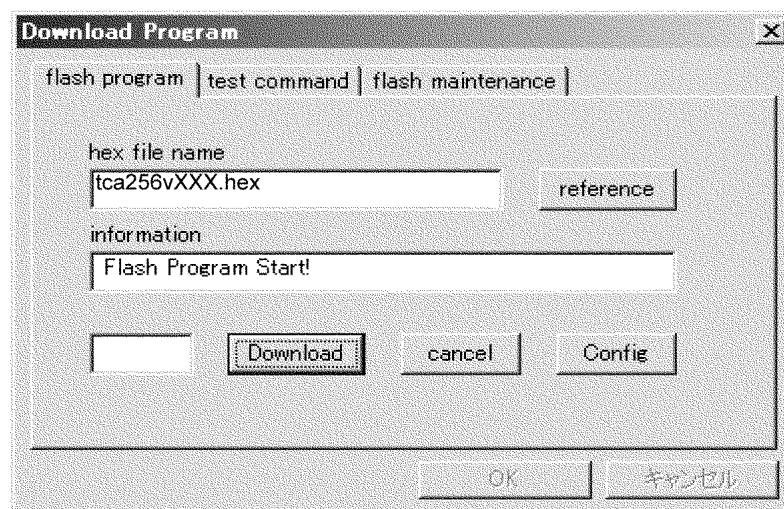
If communication check become "OK", Display will show "CRC OK".

If communication NG, click "cancel" key, then back to step [4]-(1) and try download again.

**[4]-(6) Downloading Start**

After several seconds, Display shows "Flash Program Start".

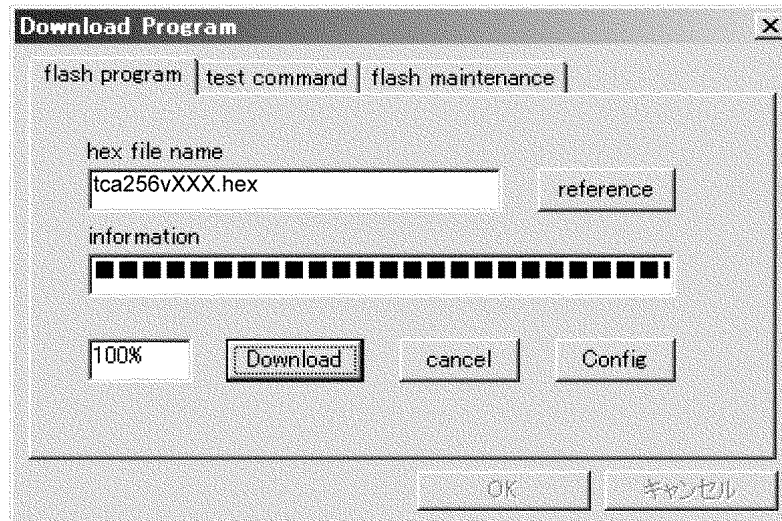
You can release the "POWER" key in this step.



[4]-(7) Downloading Complete

If downloading finished, display shows "Download finished successfully!".

Click "off" then disconnect the serial PC cable.



11.2. Adjustments (Handset and Charger Unit)

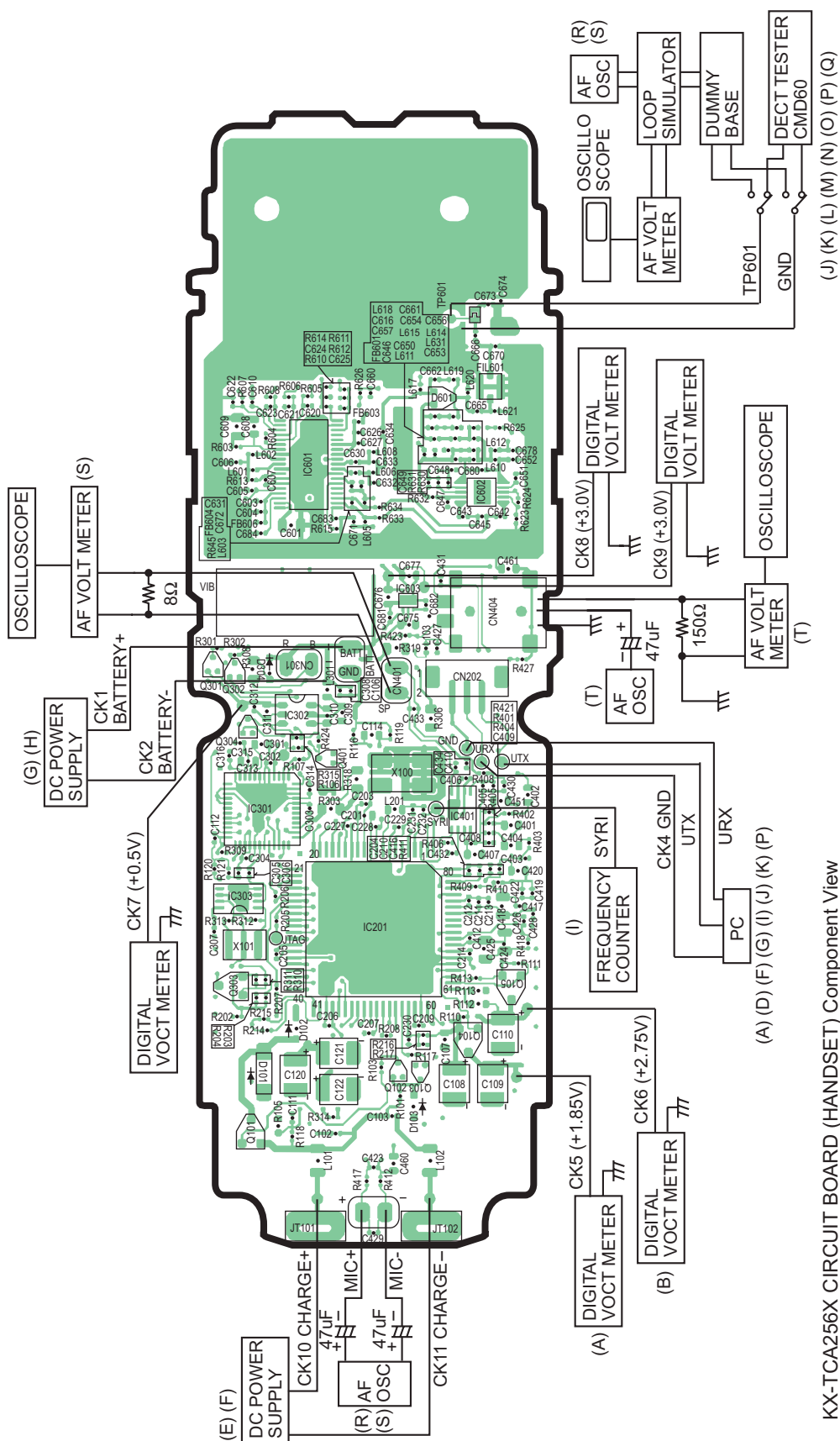
11.2.1. Adjustment (Handset)

	Items	Adjustment Point	Procedure*	Check or Replace Parts				
(A)*	1.8V Supply Confirmation	CK5	1. Confirm that the voltage between test point "CK5" and GND is 1.85V±0.02V. 2. Adjust the 1.8V voltage of CK5 executing command "bandgap XX" (XX is the value).	IC201, Q104, R110				
(B)	2.7V Supply Confirmation	-	1. Confirm that the voltage between "CK6" and GND is 2.775V±0.1V.	IC201, Q105,R111, R112,R113				
(C)*	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. <div style="display: flex; align-items: center; justify-content: center;"><div style="margin-right: 10px;">ex.)</div><table border="1"><tr><td>check sum value</td><td>program number</td></tr><tr><td>6159</td><td>U411AG</td></tr></table></div>	check sum value	program number	6159	U411AG	IC201, X100,C203
check sum value	program number							
6159	U411AG							
(D)	Charge Control Check & Charge Current Monitor Confirmation	-	1. Apply 6V between JT101(+) and JT102(-) with current limit of PSU to 200mA. 2. Confirm that the charge current is ON/OFF. 3. SW to decrease current limit of PSU to 100mA. 4. Confirm that the charge current is stable.	IC201, Q101,L101, L102,Q102, R101,R103, Q103,R117, D101,D102, D103				
(E)*	Charge Detection (OFF) Confirmation	-	1. Stop supplying 6V to JT101(+) and JT102(-). 2. Execute the command "charge". 3. Confirm that the returned value is 0x01 (hex).	IC201, R118,C111, L101,L102,				
(F)*	Battery Monitor Confirmation	-	1. Apply 3.8V ± 0.005V between BATT(+) and BATT(-). 2. Execute the command "Backloff", then "readbatt". 3. Confirm: 29 ≤ returned value ≤ 36 (Hex) 4. Adjust the Battery Monitor executing command "wreeprom 00 01 01 XX", then "wreeprom 00 36 01 XX-0E" (XX is the value).	IC201, R216,R217, C230				
(G)	Battery low Confirmation	-	1. Apply 3.5V between BATT(+) and BATT(-). 2. Confirm that there is no flashing of Battery Icon. 3. Apply 3.3V between BATT(+) and BATT(-). 4. Confirm that there is flashing of Battery.	IC201, R216,R217, C230				
(H)*	BBIC Clock Adjustment	SYRI	1. Execute the command "contx". 2. Adjust the frequency of SYRI executing the command "setfreq xx (where xx is the value)" so that the reading of the frequency counter is 10.368000MHz ±10Hz.	IC201, X100,C203, C232,L201, C231,C610				

	Items	Adjustment Point	Procedure*	Check or Replace Parts
(I)*	Transmitted Power Confirmation	TP601	<p>Remove the Antenna before starting step from 1 to 4.</p> <ol style="list-style-type: none"> 1. Configure the DECT tester (CMD60) as follows; <Setting> <ul style="list-style-type: none"> • Test mode: PP • RFPI: 0102030408 • Traffic Carrier: 5 • Traffic Slot: 4 • Mode: Loopback • RF LEVEL=-80dBm 2. Execute the command "regcmd60 01 02 03 04 08". 3. Initiate connection from DECT tester. 4. Confirm that the NTP value at TP601 is 20dBm~25dBm. 	IC201, IC601, IC602, IC603, FIL601, C665,C661, L618, D601, C654,L616, R625,C657, L615,L614, C656,L610, C653,L611, C650,C646, R623,C642, C643,C645, R633,R634, R645,L619, C662,L617, L605,L603, R615,L612, L620
(J)*	Modulatoin Check and Adjusment	-	<p>Follow steps 1 to 3 of (I) above.</p> <ol style="list-style-type: none"> 4. Confirm that the B-Field Modulation is 360kHz/div~380kHz/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.) 	IC201, IC601
(K)	Frequency Offset Confirmation	-	<p>Follow steps 1 to 3 of (I) above.</p> <ol style="list-style-type: none"> 4. Confirm that the frequency Offset is $< \pm 45\text{kHz}$. 	IC201, IC601, IC602, IC603, FIL601, C665,C661, L618, D601, C654,L616, R625,C657, L615,L614, C656,L610, C653,L611, C650,C646, R623,C642, C643,C645, R633,R634, R645,L619, C662,L617, L605,L603, R615,L612, L620,C608, R603,C609, C607,R613, C606,L601, L602
(L)	Frequency Drift Confirmation	-	<p>Follow steps 1 to 3 of (I) above.</p> <ol style="list-style-type: none"> 4. Confirm that the frequency Drift is $< \pm 30\text{kHz/ms}$. 	IC601, IC603, L619,L620, C662,L617, C660,R626, C634,L606, C633,C632, L608,C631, C630,C661, L618
(M)	Sensitivity Receiver Confirmation	-	<p>Follow steps 1 to 3 of (I) above.</p> <ol style="list-style-type: none"> 4. Set DECT tester power to -88dBm. 5. Confirm that the BER is $< 1000\text{ppm}$. 	IC1,IC3, L2,C54, C60,C61, C62,C63, C64,C65, C66,C67, C69,C81, C82,C56, R58,R55, R76

	Items	Adjustment Point	Procedure*	Check or Replace Parts
(N)	Timing Confirmation	-	Follow steps 1 to 3 of (I) above. 4. Confirm that the Timing accuracy is $< \pm 0.5\text{ppm}$.	IC601, R631,C649, IC201
(O)*	RSSI Level Confirmation	-	Follow steps 1 to 3 of (I) above. 4. Set DECT tester power to -81dBm. 5. Execute the command "readrssi". 6. Confirm that the returned value is $0x11\pm 8$ (hex). 7. Set DECT tester power to -63dBm. 8. Execute the command "readrssi". 9. Confirm that the returned value is $0x1E\pm 8$ (hex).	IC601, R610,C624, R614
(P)	Power RAMP Confirmation	-	Follow steps 1 to 3 of (I) above. 4. Confirm that Power RAMP is matching.	IC602, C651
(Q)	Audio Check and confirmation	-	1. Link to standard 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 reference sample? 1.5dBm and confirm that the distortion level is $< 5\%$. 5. Input -20dBm/1KHz to Line I/F and measure Receiving level at CN402-1 and CN402-2. 6. Confirm that the level is reference sample $\pm 1.5\text{dBm}$ and confirm that the distortion level is $< 5\%$.	IC201, R407,C413, C415, CN404, R418,C425, CN404
(R)	SP phone Audio check and confirmation	-	1. Link to standard 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 -45dBm/1KHz to MIC and measure Line output level. 5. Confirm that the level is reference sample $\pm 1.5\text{dBm}$ and confirm that the distortion level is $< 5\%$. 6. Input -20dBm/1KHz to Line I/F and measure Receiving level at CN401-1 and CN401-2. 7. Confirm that the level is reference sample $\pm 1.5\text{dBm}$ and confirm that the distortion level is $< 5\%$.	IC201, R408,C410, IC401, R405,C430, C405,C409, C408,R406, C407,C432, IC301, IC201, R404,C404, R403,C403
(S)	Headset Audio check and confirmation	-	1. Link to standard BASE which is connected to Line Simulator. 2. Set line voltage to 48V and line current to 40mA. 3. Input -45dBm/1kHz across Mic terminals on headset cable. 4. Confirm that the level is reference sample $\pm 1.5\text{dBm}$ and confirm that the distortion level is $< 5\%$. 5. Input -20dBm/1kHz to Line I/F. 6. Confirm that the level is reference sample $\pm 1.5\text{dBm}$ and confirm that the distortion level is $< 5\%$. (SP terminals on headset cable is load of 150 ohm)	IC201, R424,R423, Q401, CN404
(T)*	EEP-ROM confirmation	-	1. EEP-ROM Confirmation (Execute the command "chk255Xv0.1.bat") 2. confirm the returned check sum Value (check sum is 7F1C)	IC201, CN202, R206,R207, R202,R203, R204
(U)	RSSI Calibration Confirmation	-	1. Set DECT Tester Power to -81dbm. 2. Run "ReadRSSI" and record the returned value. 3. Run "eeprom write" and write the returned value. WrEeprom 00 50 1 XX RdEeprom 00 50 1 4. Set DECT Tester Power to -63dbm. 5. Run "ReadRSSI" and record the returned value. 6. Run "eeprom write" and write the returned value. WrEeprom 00 51 1 XX RdEeprom 00 51 1	IC201, CN202, R206,R207, R202,R203, R204

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



11.2.3. Adjustment (Charger Unit)

	Items	Adjustment Point	Procedure	Check or Replace Parts
(A)	Charging Check	-	1. Connect Charge Contact 12Ω/2W register between charge+ and charge-. 2. Measure and confirm voltage across the register is 2.7V±0.2V.	

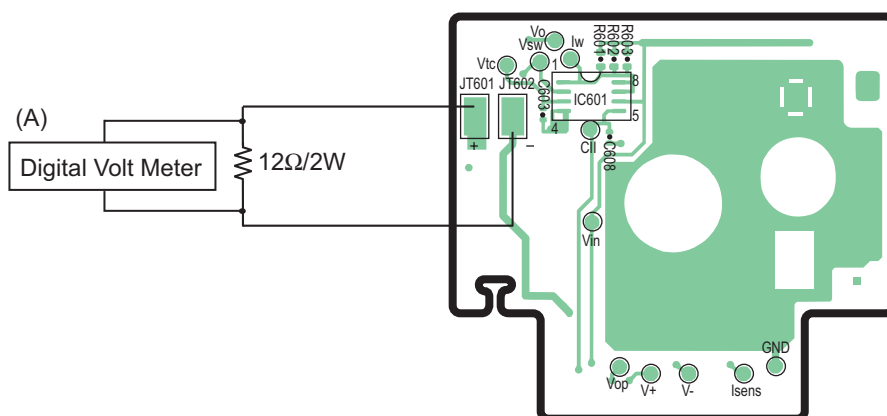
Note:

After the measuring, sock up the solder of TP.

11.2.4. Adjustment Standard (Charger Unit)

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

11.2.4.1. Flow Solder Side View



KX-TCA256X CIRCUIT BOARD (CHARGER UNIT)
Flow Solder Side View

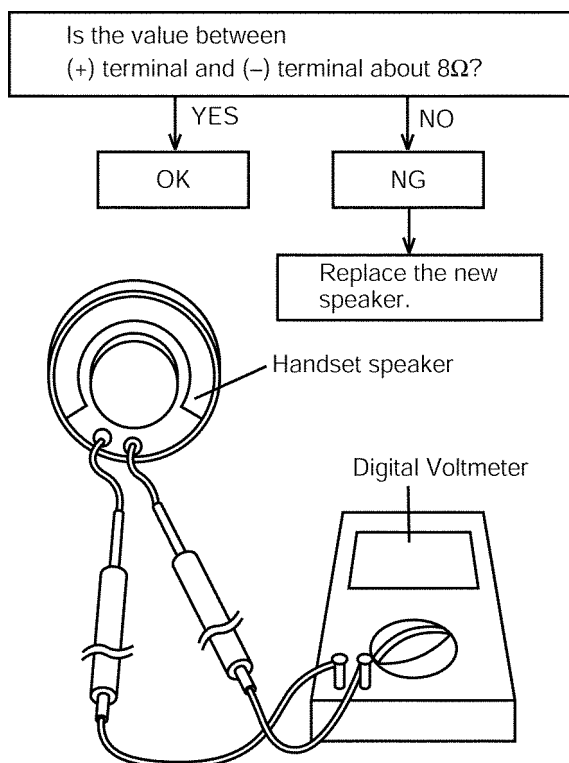
11.3. RF Specification (Handset)

Item	Value	Refer to -. **	Remarks
TX Power	20 dBm~25 dBm	Adjustment (Handset) (I)	
Modulation	360 kHz/div~380 kHz/div	Adjustment (Handset) (J)	Data type: Fig31
Frequency Offset	-45 kHz~+45 kHz	Adjustment (Handset) (K)	
Frequency Drift	< ± 30 kHz / ms	Adjustment (Handset) (L)	
RX Sensitivity	< 1000 ppm	Adjustment (Handset) (M)	
Timing Accuracy	< ± 0.5 ppm	Adjustment (Handset) (N)	
RSSI Level	0x11 hex±8 hex (at -81dBm) 0x1E hex±8 hex (at -63dBm)	Adjustment (Handset) (O)	
Power RAMP	Power RAMP is matching	Adjustment (Handset) (P)	

. Refer to **Adjustment (Handset) (P.36)

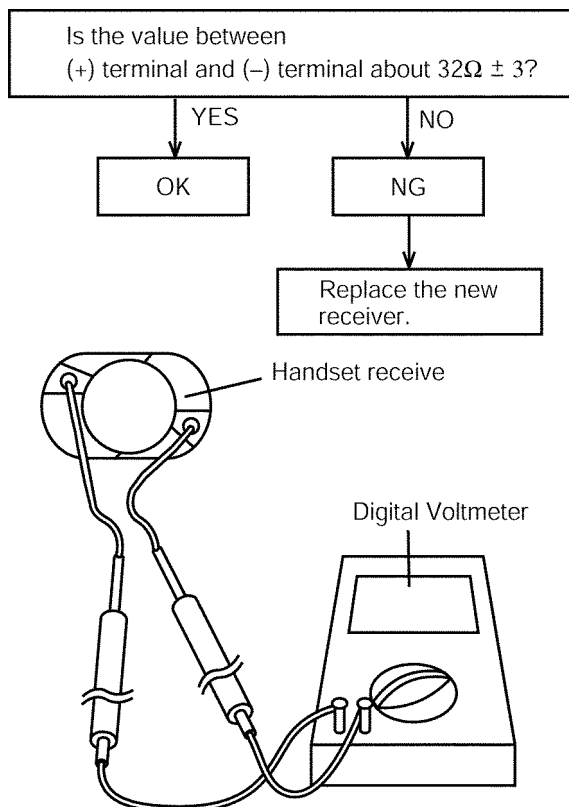
11.4. How to Check the Handset Speaker

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



11.5. How to Check the Handset Receiver

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



11.6. Frequency Table (MHz)

Channel No	HANDSET	
	Transmit Frequency	Receive Frequency
3	1893.888	1893.888
4	1892.160	1892.160
5	1890.432	1890.432
6	1888.704	1888.704
7	1886.976	1886.976
8	1885.248	1885.248
9	1883.520	1883.520
10	1881.792	1881.792

Note:

Channel No. 10: In the Test Mode on Handset.

11.7. How To Replace a 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.

11.7.1. 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)

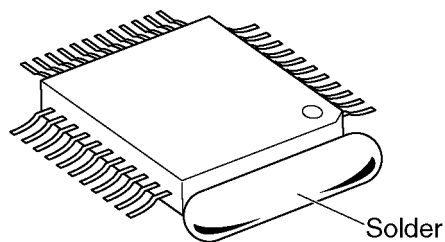
Note: See **About Lead Free Solder (PbF: Pb free)** (P.4).

11.7.2. Removal Procedure

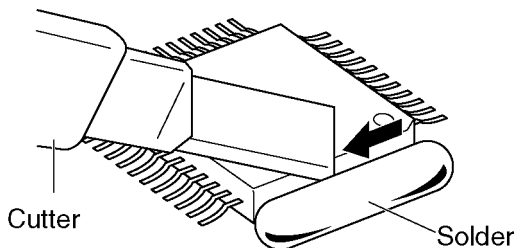
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

Note:

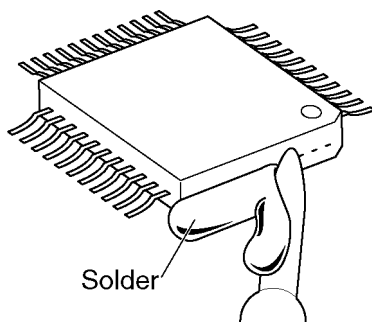
If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



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



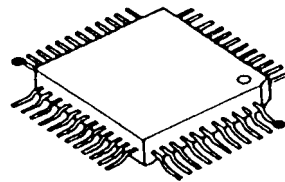
3. While the solder melts, remove it together with the IC pins.



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.

11.7.3. Procedure

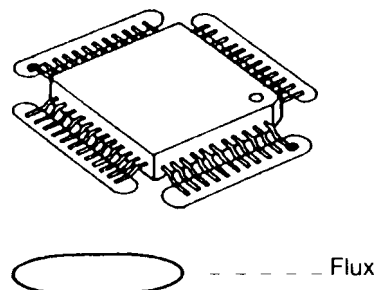
1. Tack the flat pack IC to the PCB by temporarily soldering two diagonally opposite pins in the correct positions on the PCB.



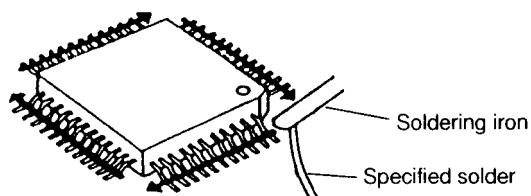
● - - - - - Temporary soldering point.

Be certain each pin is located over the correct pad on the PCB.

2. Apply flux to all of the pins on the IC.

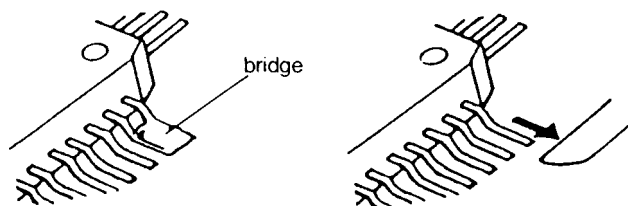


3. Being careful to not unsolder the tack points, slide the soldering iron along the tips of the pins while feeding enough solder to the tip so that it flows under the pins as they are heated.



11.7.4. Removing Solder From Between Pins

1. Add a small amount of solder to the bridged pins.
2. With a hot iron, use a sweeping motion along the flat part of the pin to draw the solder from between the adjacent pads.



12 Schematic Diagram

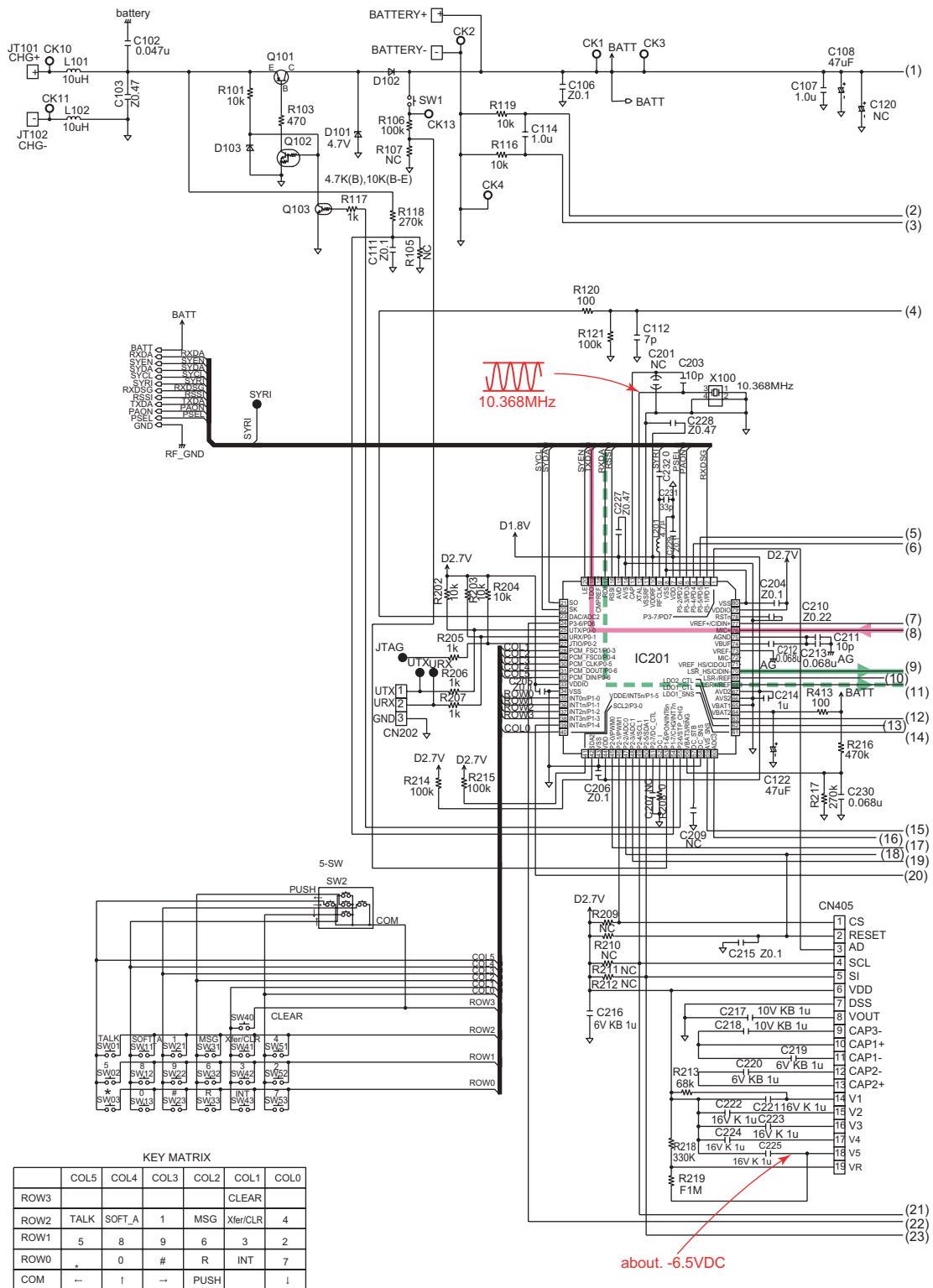
12.1. For Schematic Diagram

12.1.1. Handset

Notes:

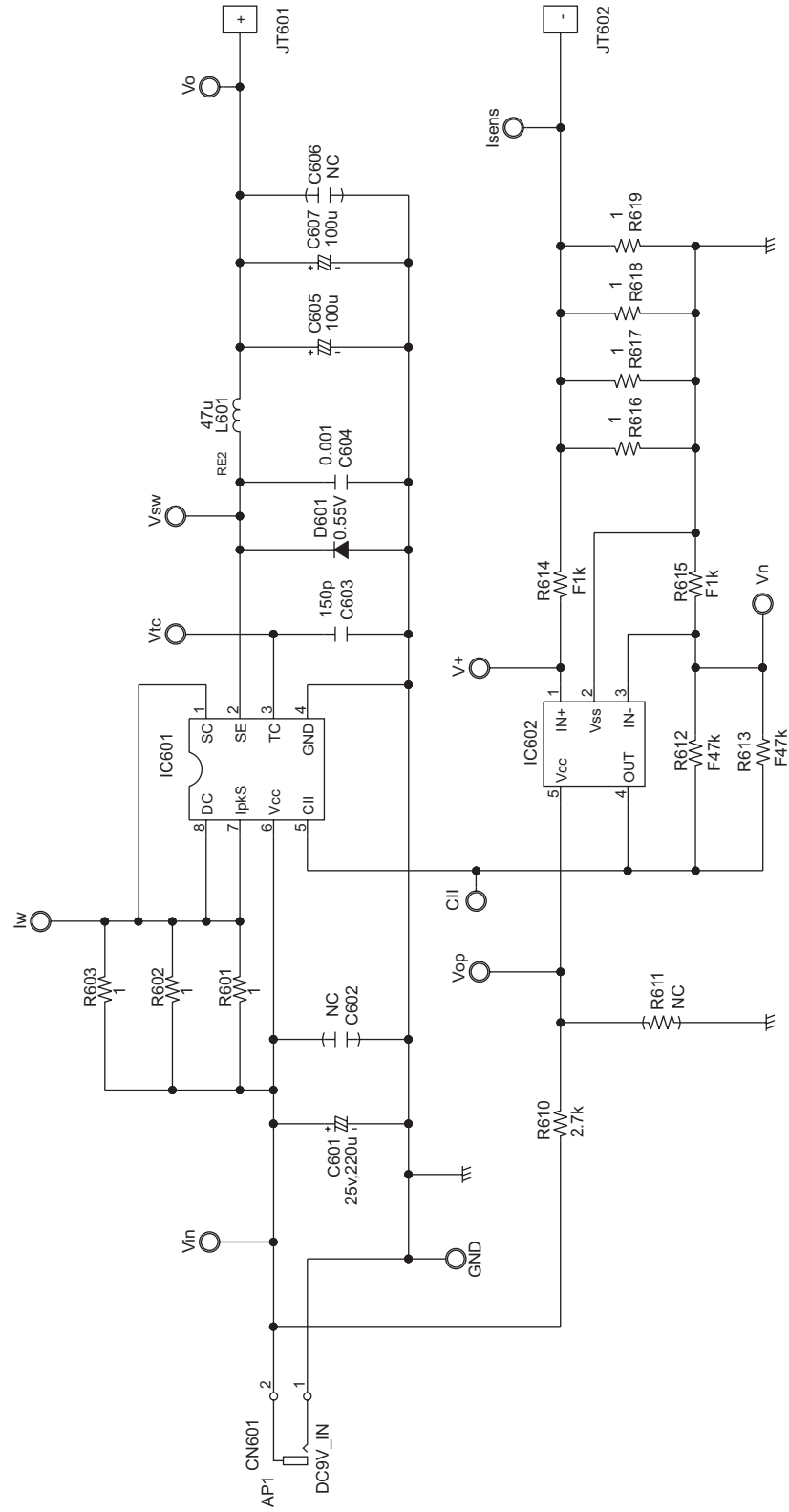
1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.

12.2. Schematic Diagram (Handset)





12.4. Charger Unit

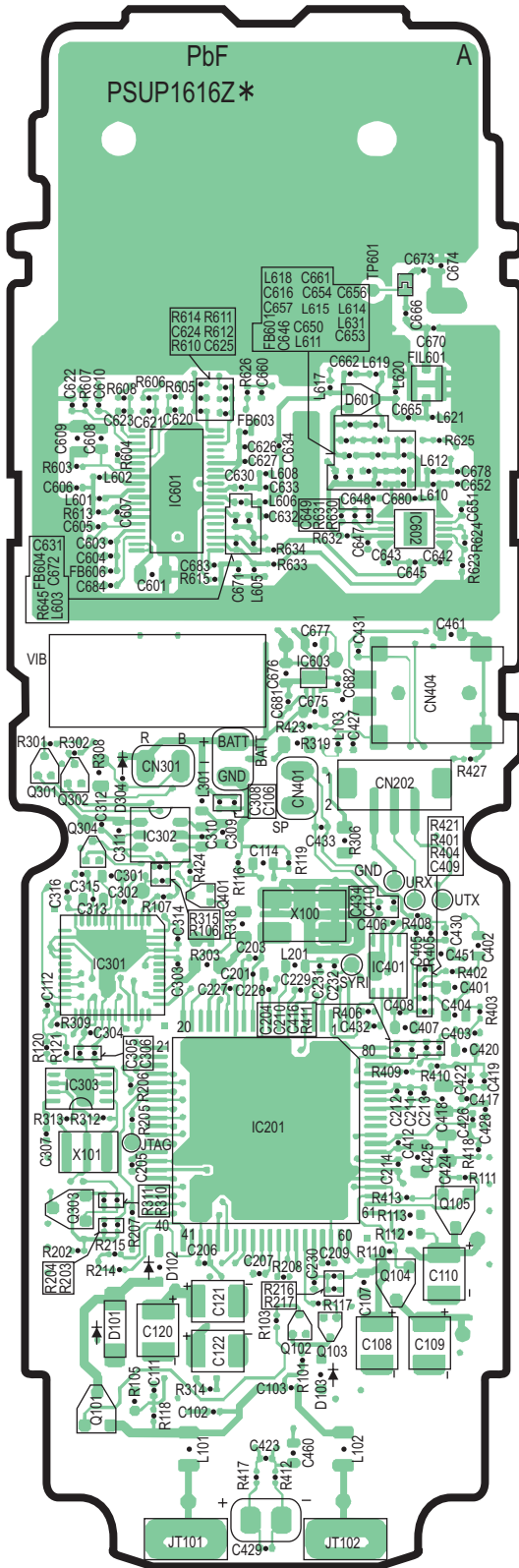


KX-TCA256X SCHEMATIC DIAGRAM (CHARGER UNIT)

13 Printed Circuit Board

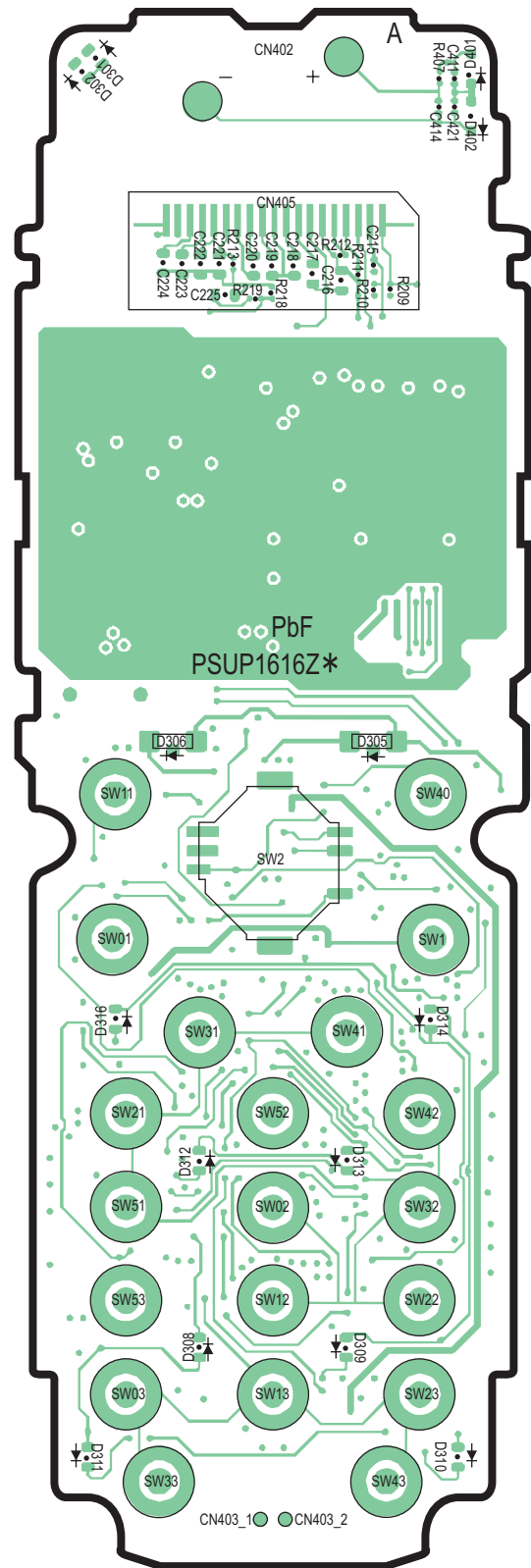
13.1. Handset

13.1.1. Component View



KX-TCA256X: CIRCUIT BOARD Component View

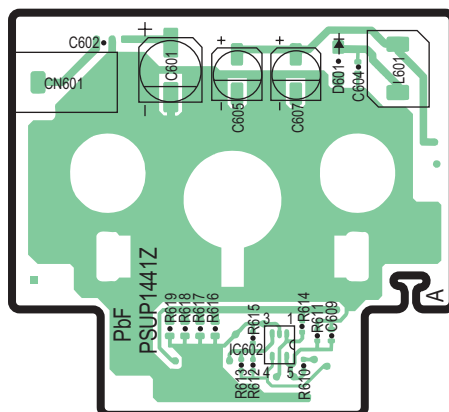
13.1.2. Flow Solder Side View



KX-TCA256X: CIRCUIT BOARD Bottom View

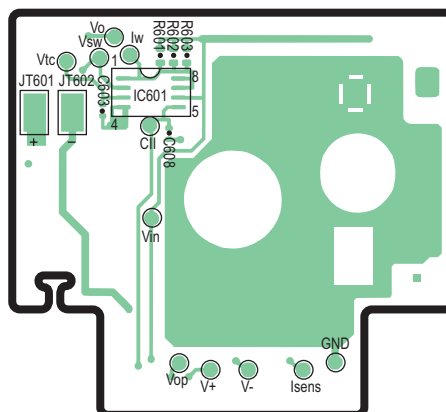
13.2. Charger Unit

13.2.1. Component View



KX-TCA256X CIRCUIT BOARD
(CHARGER UNIT) Component View

13.2.2. Flow Solder Side View



KX-TCA256X CIRCUIT BOARD
(CHARGER UNIT) Flow Solder Side View

14 Appendix Information of Schematic Diagram

14.1. CPU Data (Handset)

14.1.1. IC201 (BBIC)

Pin No	Description	I/O	Connection	at Normal mode	at Reset mode
1	P3_7/PD7	D,O	LCD_A0	O	O
2	P3_1/PD1	D,O	RXDSG	O	O
3	P3_5/PD5	D,O	SPAMP CD	O	O
4	P3_4/PD4	D,I/O	MIDI ERQ	I	O
5	P3_3/PD3	D,O	PAON	O	O
6	P3_2/PD2	D,O	PSEL	O	O
7	VDD	-	-	-	-
8	VSS	-	-	-	-
9	RFCLK	D,O	SYRI	O	O
10	VDDRF	-	-	-	-
11	VSSRF	-	-	-	-
12	Xtal1	A,I	←	I	O
13	CAP	A,I	←	I	O
14	AVS	-	-	-	-
15	AVD	-	-	-	-
16	RSSI	A,I	RSSI	I	O
17	RDI	D,I	RXDA	I	O
18	CMPREF	A,I	NC	OPEN	O
19	TDO	A,O	TXDA	A,O	O
20	LE	D,O	SYEN	D,O	O
21	SO	D,O	SYDA	D,O	O
22	SK	D,O	SYCL	D,O	O
23	DAC/ADC2	D,I	JACK DETECTION	I	O
24	P3_6/PD6	D,I/O	MIDI_SRQ	I	O
25	UTX/P0_0	D,O	UTX	O	O
26	URX/P0_1	D,I	URX	I	O
27	JTIO/P0_2	D,I	JTAG	I	O
28	PCM_FSC1/P0_3	D,I	COL1	I	O
29	PCM_FSC0/P0_4	D,I	COL2	I	O
30	PCM_CLK/P0_5	D,I	COL3	I	O
31	PCM_DOUT/P0_6	D,I	COL4	I	O
32	PCM_DIN/P0_7	D,I	COL5	I	O
33	VDDIO	-	-	-	-
34	VSS	-	-	-	-
35	INT0n/P1_0	D,O	ROW0	O	O
36	INT1n/P1_1	D,O	ROW1	O	O
37	INT2n/P1_2	D,O	ROW2	O	O
38	INT3n/P1_3	D,O	ROW3	O	O
39	INT4n/P1_4	D,I	MIDI_IRQ	I	O
40	VDDE/INT5n/P1_5	D,O	COL0	O	-
41	SCL2/P3_0	D,O	SCL	O	O
42	SDA2	D,I/O	SDA	I/O	O
43	VSS	-	-	-	-
44	VDD	-	-	-	-
45	P2_0/PWM0	D,O	PWM0	O	O
46	P2_1/PWM1	D,O	CS2	O	O
47	P2_2/ADC0	D,O	EX_RESET	O	O
48	P2_3/ADC1	D,O	MIDI-CS	O	O
49	P2_4/SCL1	D,O	LCD-SCLK MIDI_SCLK	O	O
50	P2_5/SDA1	D,O	LCD-SCLK MIDI_SCLK	O	O
51	P2_7/DC_CTRL	D,O	DC_CTRL	O	O
52	DC_I	A,I	←	I	O
53	P1_6/PON/INT6n	A,I	PON	I	O
54	P1_7/CHARGE/INT7n	A,I	CHARGE	I	O
55	P2_6/stop_charge	A,O	STOP-CHARGE	O	O
56	VBAT3/RINGING	A,I	VBAT3	I	O
57	DC_stab	A,O	←	O	O
58	DC_Sense	A,I	←	I	O

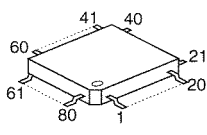
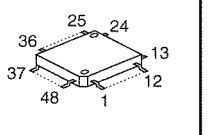
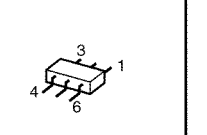
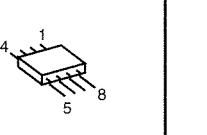
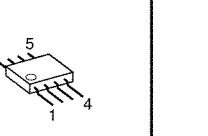
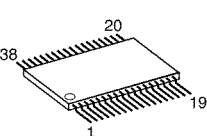
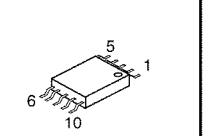
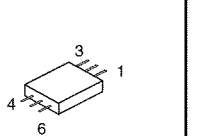
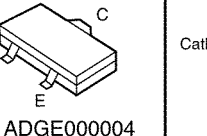
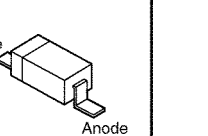
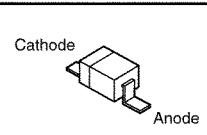
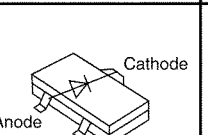
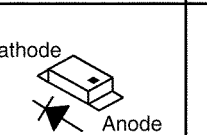
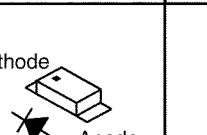
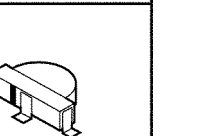
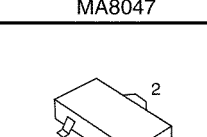
Pin No	Description	I/O	Connection	at Normal mode	at Reset mode
59	AVS_sense	A,I	←	I	O
60	ADC3	A,I	←	I	O
61	LDO1_sense	A,I	←	I	O
62	LDO1_CTRL	A,O	←	O	O
63	LDO2_CTRL	A,O	←	O	O
64	VBAT2	A,I	←	I	O
65	VBAT1	A,I	←	I	O
66	AVS2	-	-	-	-
67	AVD2	-	-	-	-
68	LSR+/REF	A,O	LSR+	O	O
69	LSR-/REF	A,O	LSR-	O	O
70	LSR_HS/CIDIN-	A,O	LSR_HS	O	O
71	VREF_HS/CIDOUT	A,O	NC	OPEN	-
72	MIC-	A,I	←	I	O
73	VREF-	A,O	←	O	O
74	VBUF	A,O	←	O	O
75	AGND	A,O	←	O	O
76	MIC+	A,I	←	I	O
77	VREF+/CIDIN+	A,O	VREF+	O	O
78	RSTN	D,I	←	I	O
79	VDDIO	-	-	-	-
80	VSS	-	-	-	-

Note:

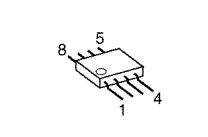
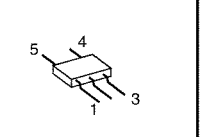
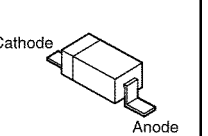
JACK DETECTION; Detect if a Headset is inserted into the JACK or not. Without a Headset, 1.5V is measured at pin 23, while with a Headset, 0V is measured at pin 23.

14.2. Terminal Guide of the ICs, Transistors and Diodes

14.2.1. Handset

 <p>C1CB00002107</p>	 <p>C1BB00000783</p>	 <p>C0DBAHC00030</p>	 <p>C0JBAB000633</p>	 <p>C0ABAA000058</p>
 <p>C1CB00001690</p>	 <p>C1CB00001691</p>	 <p>C0DBC GC00051</p>	 <p>B1ADGE000004 PSVTDTC143X B1ABCF000103 PSVTDTC143TE</p>	 <p>B0BC4R900003</p>
 <p>MA2Z72000 MA111 MA8047</p>	 <p>PSVDUDZ20B</p>	 <p>PQVDBR1111C</p>	 <p>LNJ308G8JRA</p>	 <p>PSWLTCA255CE</p>
 <p>B0DDCL000001</p>				

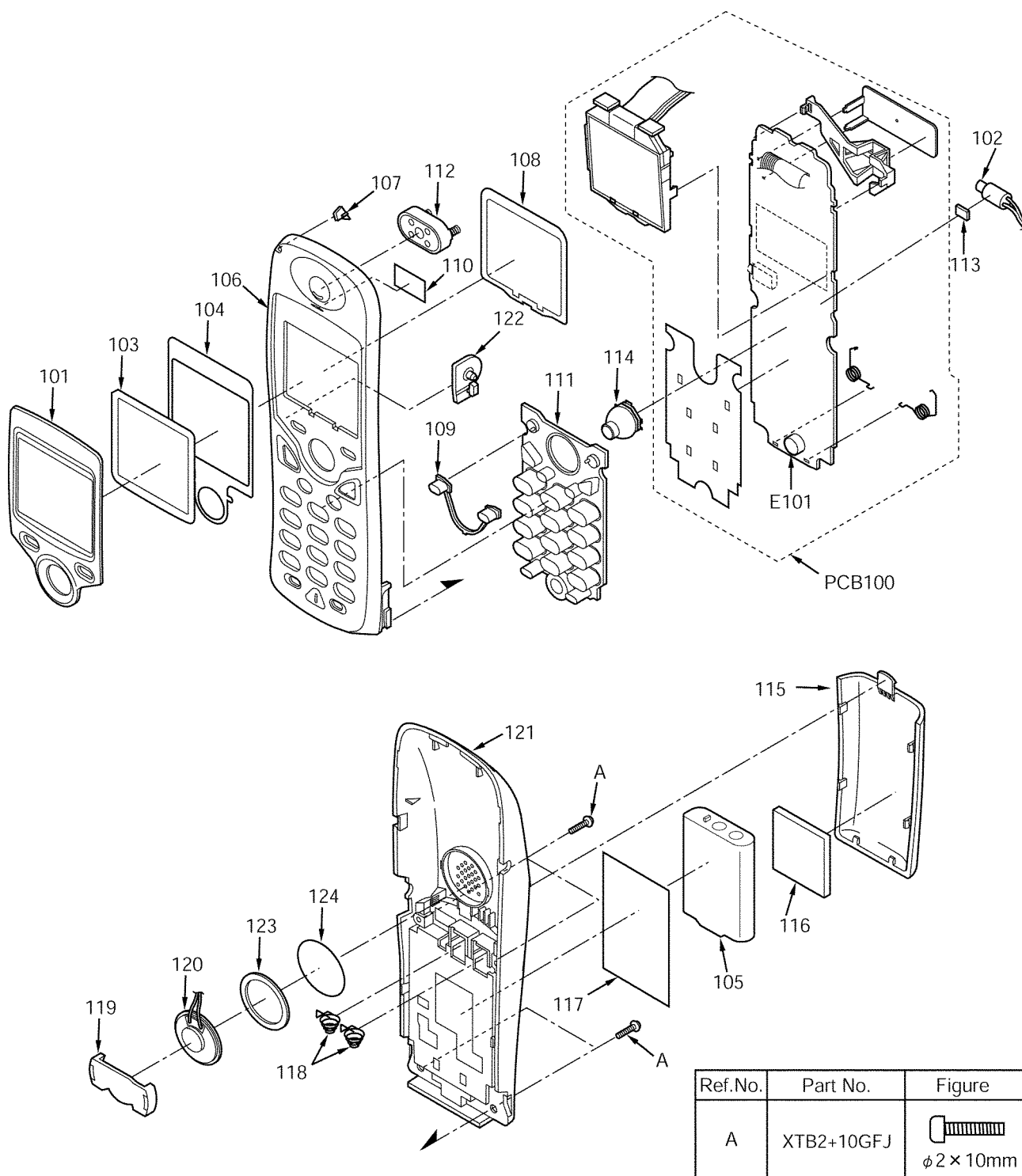
14.2.2. Charger Unit

 <p>PQVIMC34063M</p>	 <p>C0ABAA000088</p>	 <p>MA738</p>
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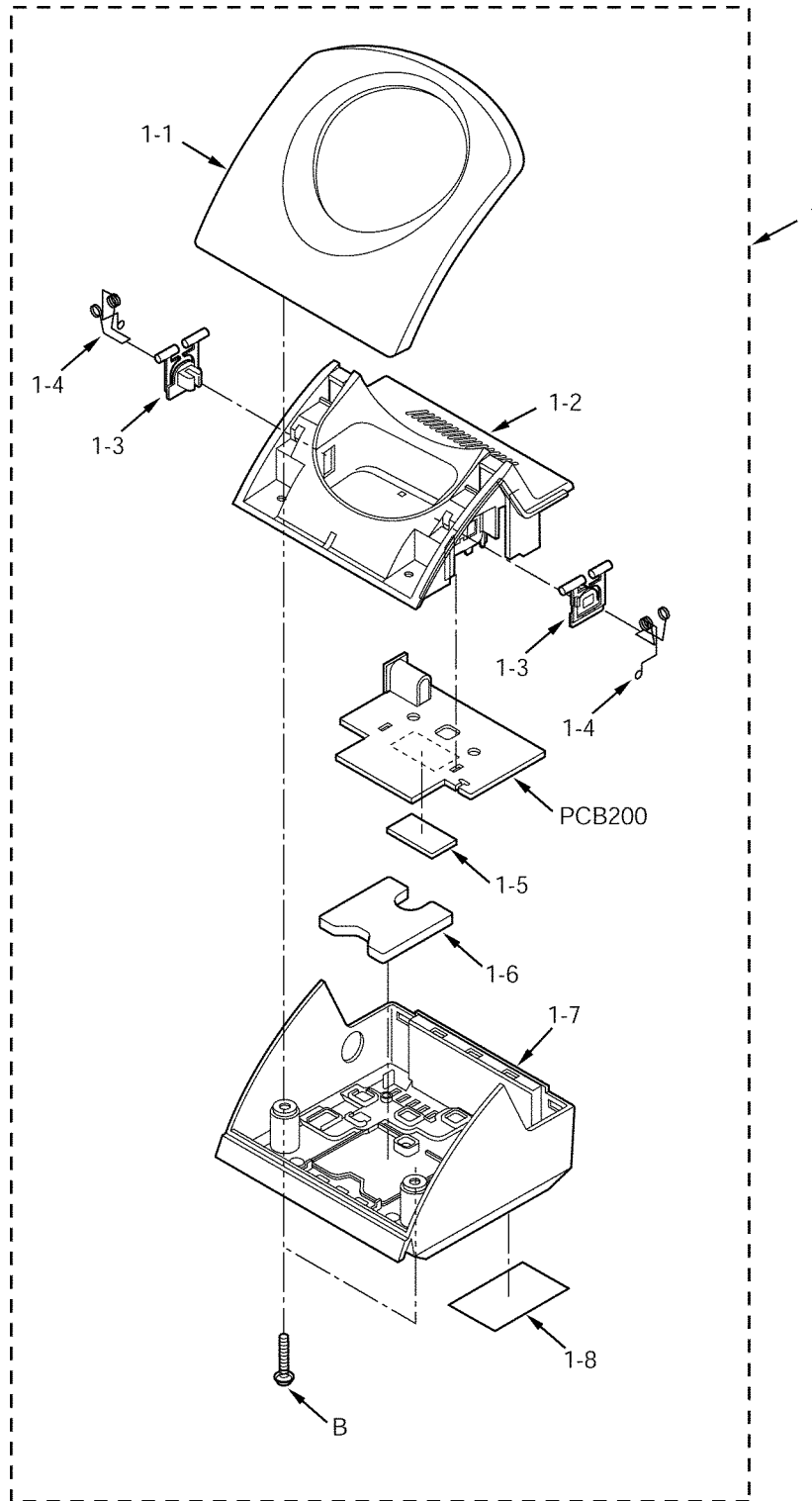
15 Exploded View and Replacement Parts List

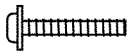
15.1. Cabinet and electrical Parts Location (Handset)

15.1.1. Handset

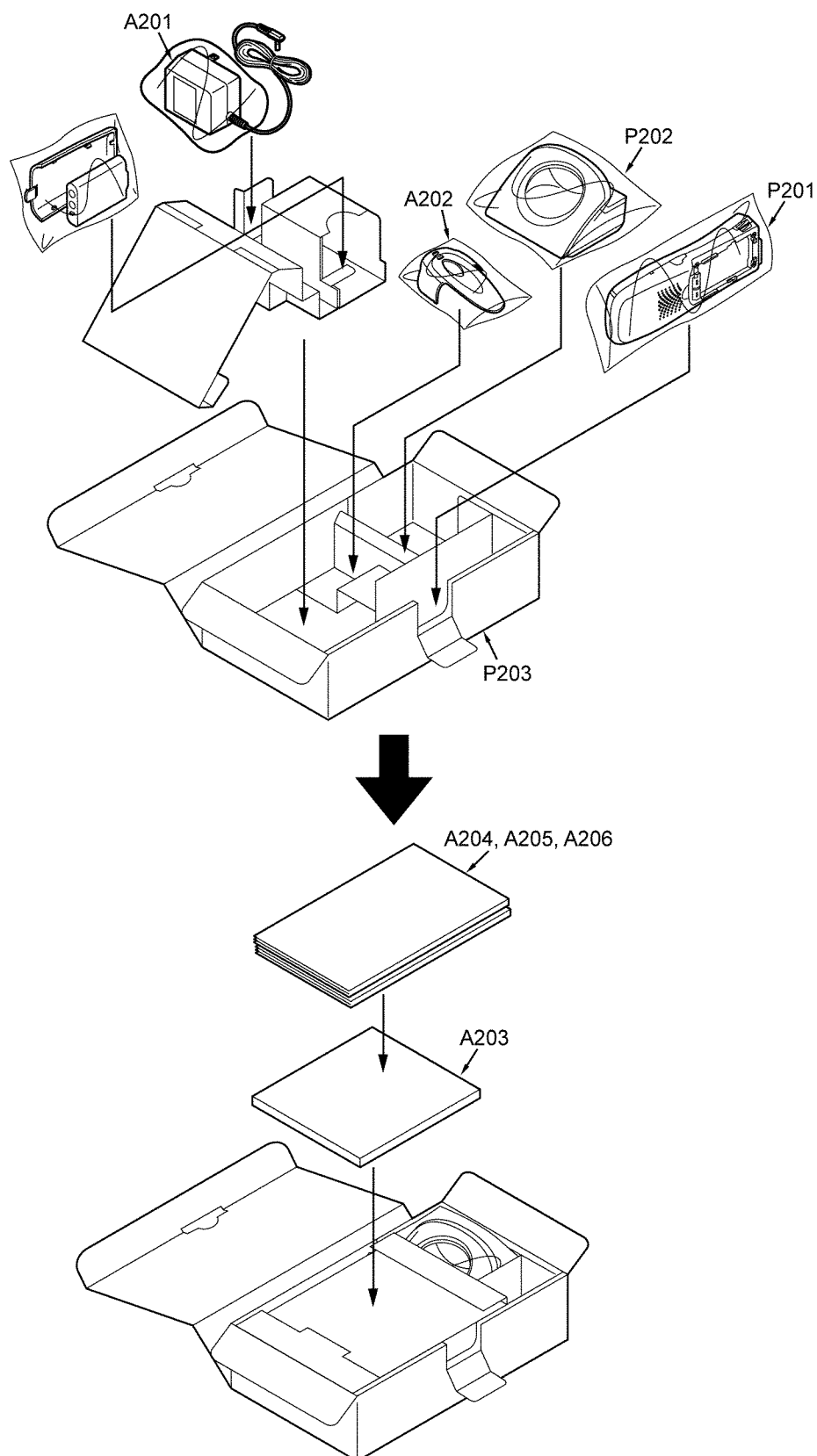


15.1.2. Charger Unit



Ref.No.	Part No.	Figure
B	XTW26+14PFJ7	 $\phi 2.6 \times 14\text{mm}$

15.2. Accessories and Packing Materials



15.3. Replacement Part List

Note:

1. RTL (Retention Time Limited)

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 depends on the type of assembly and the laws governing parts and product retention. At the end of this period, the assembly will no longer be available.

2. Important safety notice

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

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

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

5. RESISTORS & CAPACITORS

Unless otherwise specified;

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

All capacitors are in MICRO FARADS (μ F), p= μ μ F

*Type & Wattage of Resistor

Type

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

Wattage

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

*Type & Voltage Of Capacitor

Type

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

Voltage

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

15.3.1. Handset

15.3.1.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
101	PSGG1020X1	GRILLE, LCD	ABS-HB
102	PSJQ1011Y	VIB MOTOR	
103	PSGP1102Z	PANEL, LCD	PC-HB
104	PSHS1044Z	TAPE, DOUBLE SIDE (LCD)	
105	N4HHGMB00007	BATTERY	
106	PSKM1140Z1	CABINET BODY	ABS-HB
107	PSGP1118Z1	OPTIC CONDUCTIVE PARTS, LED LENS	ABS-HB
108	PSHE1159Z	SPACER, LCD SPONGE	
109	PSBC1040Z1	PUSH BUTTON, SOFT	ABS-HB
110	PSHX1267Z	SPACER, COVER SHEET	ABS-HB
111	PSSX1031Z1	KEYBOARD SWITCH	
112	L0AD01B00001	SPEAKER	
113	PSHE1168Z	SPACER, VIB MOTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
114	PSBC1041Z1	PUSH BUTTON, CURSOL	ABS-HB
115	PSKK1052Z1	LID, BATTERY	ABS-HB
116	PSHE1167Y	SPACER, BATTERY COVER	
117	PSGT2720Y	NAME PLATE	Δ
118	PSJC1006Z	BATTERY TERMINAL	
119	PSHR1309Z	GUIDE, SPEAKER	ABS-HB
120	L0AA02A00048	SPEAKER	
121	PSKF1119Y1	CABINET COVER ASS'Y	ABS-HB
122	PSKE1069Z3	COVER, EARPHONE	
123	PSHG1246Z	SPEAKER, RUBBER SHEET	
124	PSHS1043Z	NET, SPEAKER	

15.3.1.2. Main P.C.Board Parts

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PSWPCA256XRU	MAIN AND RF P.C.BOARD ASS'Y (RTL)	
		(ICs)	
IC201	C1CB00002107	IC	
IC301	C1BB00000783	IC	
IC302	C0DBAHC00030	IC	
IC303	C0JBAB000633	IC	
IC401	C0ABAA000058	IC	
IC601	C1CB00001690	IC	
IC602	C1CB00001691	IC	
IC603	C0DBC GC00051	IC	
		(TRANSISTORS)	
Q101	B1ADGE000004	TRANSISTOR (SI)	
Q102	PSVTDTC143X	TRANSISTOR (SI)	S
Q103	B1ABCF000103	TRANSISTOR (SI)	
Q104	B1ADGE000004	TRANSISTOR (SI)	
Q105	B1ADGE000004	TRANSISTOR (SI)	
Q301	PSVTDTC143X	TRANSISTOR (SI)	S
Q302	PSVTDTC143X	TRANSISTOR (SI)	S
Q303	B1ADGE000004	TRANSISTOR (SI)	
Q304	PSVTDTC143TE	TRANSISTOR (SI)	
Q401	B1ABCF000103	TRANSISTOR (SI)	
		(DIODES)	
D101	B0BC4R900003	DIODE (SI)	
D102	MA2Z72000	DIODE (SI)	
D103	PSVDUDZ20B	DIODE (SI)	S
D301	PQVDBR1111C	DIODE (SI)	S
D302	LNJ308G8JRA	LED	
D304	MA111	DIODE (SI)	S
D305	PSWLTCA255CE	LED KIT	
D306	PSWLTCA255CE	LED KIT	
D308	LNJ308G8JRA	LED	
D309	LNJ308G8JRA	LED	
D310	LNJ308G8JRA	LED	
D311	LNJ308G8JRA	LED	
D312	LNJ308G8JRA	LED	
D313	LNJ308G8JRA	LED	
D314	LNJ308G8JRA	LED	
D316	LNJ308G8JRA	LED	
D401	MA8047	DIODE (SI)	S
D402	MA8047	DIODE (SI)	S
D601	B0DDCL000001	DIODE (SI)	
		(COILS)	
C662	G1C22NJ00010	COIL	
C666	G1C1N5Z00005	COIL	
L101	G1C100MA0072	COIL	
L102	G1C100MA0072	COIL	
L201	G1C4R7M00012	COIL	
L301	PQLQR2KA12T	COIL	S
L601	G1C4N7Z00017	COIL	
L602	G1C4N7Z00017	COIL	
L603	PSLQR1S27NJ	COIL	
L605	PSLQR1S27NJ	COIL	
L606	PQLQR4C2N7S	COIL	S

Ref. No.	Part No.	Part Name & Description	Remarks
L608	PQLQR4C2N7S	COIL	S
L610	G1C3N3ZA0061	COIL	
L611	G1C3N3ZA0061	COIL	
L612	PSLQR1S27NJ	COIL	
L614	PQLQR4C5N6S	COIL	S
L615	PQLQR4C5N6S	COIL	S
L616	PSLQR1S27NJ	COIL	
L617	PSLQR1S27NJ	COIL	
L618	G1C22NJ00010	COIL	
L620	PQLQR4C5N6S	COIL	S
R418	PSLQR2S471MT	COIL	
R613	PSLQR1S27NJ	COIL	
		(CONNECTOR)	
CN202	K1KA03AA0083	CONNECTOR, 3P	
		(CRYSTAL OSCILLATORS)	
X100	H0J103500013	CRYSTAL OSCILLATOR	S
X101	H2D600400004	CRYSTAL OSCILLATOR	
		(FILTERS)	
FB601	J0JBC0000043	IC FILTER	
FB603	J0JBC0000043	IC FILTER	
FB604	J0JBC0000043	IC FILTER	
FB606	J0JBC0000043	IC FILTER	
FIL601	J0D1890B0002	CERAMIC FILTER	
		(JACK)	
CN404	K2HD103D0001	JACK	
		(SWITCHES)	
SW2	K0C115A00003	SEESAW SWITCH	
		(VARISTORS)	
C460	D4ZZ00000024	VARISTOR	
C461	D4ZZ00000024	VARISTOR	
		(CAPACITORS)	
L619	ECUE1H330JCQ	33P	
C102	F1G1C473A048	0.047	
C103	F1G1C474A108	0.47	
C106	F1G1C104A083	0.1	
C107	ECUV1A105ZFV	1	
C108	F3K1A476A002	47	
C109	ECST0JX107	100	
C110	F3K0J107A002	100	
C111	F1G1C104A083	0.1	
C112	ECUE1H070DCQ	7P	S
C114	ECUV1A105ZFV	1	
C121	F3K1A476A002	47	
C122	F3K1A476A002	47	
C203	F1G1H100A420	10P	S
C204	F1G1C104A083	0.1	
C205	F1G1C104A083	0.1	
C206	F1G1C104A083	0.1	
C210	ECUE1A224ZFQ	0.22	
C211	F1G1H100A420	10P	S
C212	ECUE1A683KBQ	0.068	S
C213	ECUE1A683KBQ	0.068	S
C214	F1G0J1050007	1	
C215	F1G1C104A083	0.1	
C216	ECUV0J105KBV	1	S
C217	F1H1A105A036	1	
C218	F1H1A105A036	1	
C219	ECUV0J105KBV	1	S
C220	F1H1A105A036	1	S
C221	F1H1C105A118	1	
C222	F1H1C105A118	1	
C223	F1H1C105A118	1	
C224	F1H1C105A118	1	
C225	F1H1C105A118	1	
C227	F1G1A4740003	0.47	
C228	F1G1A4740003	0.47	

Ref. No.	Part No.	Part Name & Description	Remarks
C229	F1G1C104A083	0.1	
C230	ECUE1A683KBQ	0.068	S
C231	ECUE1H330JCQ	33P	
C301	ECUV0J105KBV	1	S
C302	F1G1C104A083	0.1	
C303	F1G1C104A083	0.1	
C304	F1G1C104A083	0.1	
C305	F1G1C104A083	0.1	
C306	F1G1C104A083	0.1	
C307	F1G1C104A083	0.1	
C308	F1G1C104A083	0.1	
C309	PSCU0JV225	2.2	
C310	PSCU1AV105ZF	1	S
C311	PSCU0JV225	2.2	
C312	ECUE1H102KBQ	0.001	S
C313	ECUV0J105KBV	1	S
C314	F1G1C104A083	0.1	
C401	ECUV1C104KBV	0.1	S
C402	ECUV1C104KBV	0.1	S
C404	ECUV1C104KBV	0.1	S
C405	ECJ0EB1H391K	390P	
C406	F1G1C104A083	0.1	
C407	ECJ1VB0J225	2.2	
C408	ECUE1H470JCQ	47P	S
C409	ECUE1H070DCQ	7P	S
C410	F1G1H100A420	10P	S
C417	F1G1H100A420	10P	S
C418	FLJ0J2260002	22	
C419	F1G1H100A420	10P	
C420	ECUV1C104KBV	0.1	
C421	F1G1H101A566	100P	
C423	F1G1H100A420	10P	S
C424	FLJ0J2260002	22	
C425	FLJ0J2260002	22	
C429	F1G1H100A420	10P	
C430	F1G1H100A420	10P	
C431	ECUE1H470JCQ	47P	S
C432	F1G1C104A083	0.1	
C433	F1G1H100A420	10P	
C434	F1G1H100A420	10P	S
C451	ECUV1C104KBV	0.1	S
C601	PQCUV1H222JC	0.0022	
C603	F1G1H100A420	10P	S
C604	F1G1C1030008	0.01	
C605	F1G1H100A420	10P	S
C606	ECUE1H102KBQ	0.001	S
C607	F1G1C1030008	0.01	
C608	ECUV1H102KBV	0.001	S
C609	ECHU1C103GB	0.01	
C610	ECUE1H120JCQ	12P	S
C620	ECUE1H120JCQ	12P	S
C621	ECUE1H120JCQ	12P	S
C622	ECUE1H120JCQ	12P	S
C623	ECUE1H120JCQ	12P	S
C624	ECUE1H102KBQ	0.001	S
C625	ECUE1H470JCQ	47P	S
C626	F1G1C1030008	0.01	
C627	F1G1H100A420	10P	S
C630	F1G1H8R0A420	8P	
C631	F1G1H8R0A420	8P	
C632	ECUE1H030CCQ	3P	S
C633	ECUE1H030CCQ	3P	S
C634	ECUE1H030CCQ	3P	S
C642	F1G1H5R0A038	5P	S
C643	F1G1H5R0A038	5P	S
C645	ECUE1H030CCQ	3P	S
C646	F1G1A1040006	0.1	
C647	F1G1H100A420	10P	S
C648	F1G1H100A420	10P	S
C649	F1G1H100A420	10P	S
C650	F1G1H100A420	10P	S
C651	F1G1H680A565	68P	
C652	F1G1H2R0A577	2P	

Ref. No.	Part No.	Part Name & Description	Remarks
C653	F1G1H2R0A577	2P	
C654	F1G1H100A420	10P	S
C656	ECUE1H1R5CCQ	1.5	S
C657	F1G1H8R0A420	8P	
C660	F1G1H100A420	10P	S
C661	ECUE1H330JCQ	33P	
C665	F1G1H8R0A420	8P	
C670	F1G1H1R0A577	1P	
C671	F1G1H100A420	10P	S
C672	F1G1H100A420	10P	S
C675	ECUV0J105KBV	1	S
C676	ECUV0J105KBV	1	S
C677	ECUV0J105KBV	1	S
C678	F1G1H100A420	10P	S
C680	ECUE1H1R5CCQ	1.5	S
C681	F1G1C1030008	0.01	
C682	F1G1C1030008	0.01	
C683	F1G1H100A420	10P	S
C684	F1G1H100A420	10P	S
		(RESISTORS)	
C232	ERJ2GEOR00	0	
C673	ERJ2GEOR00	0	
L103	ERJ2GEYJ121	120	S
R101	ERJ2GEYJ103	10K	S
R103	ERJ2GEJ471	470	S
R106	ERJ2GEJ104	100K	S
R110	ERJ2GEJ153	15K	S
R111	ERJ2GEYJ562	5.6K	S
R112	ERJ3EKF2002	20K	
R113	ERJ3EKF1002	10K	
R116	ERJ2GEYJ103	10K	S
R117	ERJ2GEYJ102	1K	S
R118	ERJ2GEYJ274	270K	S
R119	ERJ2GEYJ103	10K	S
R120	ERJ2GEJ101	100	S
R121	ERJ2GEJ104	100K	S
R202	ERJ2GEYJ103	10K	S
R203	ERJ2GEYJ103	10K	S
R204	ERJ2GEYJ103	10K	S
R205	ERJ2GEYJ102	1K	S
R206	ERJ2GEYJ102	1K	S
R207	ERJ2GEYJ102	1K	S
R208	ERJ2GEOR00	0	
R213	D0GA683JA021	68K	
R214	ERJ2GEJ104	100K	S
R215	ERJ2GEJ104	100K	S
R216	ERJ2GEYJ474	470K	S
R217	ERJ2GEYJ274	270K	S
R218	ERJ2RKF334	330K	
R219	ERJ2RKF105	1M	
R301	ERJ2GEYJ121	120	S
R302	ERJ2GEJ470	47	S
R303	D0GD100JA018	10K	
R306	PQ4R10XJ820	82	S
R308	PQ4R10XJ120	12	S
R309	ERJ2GEYJ103	10K	S
R310	ERJ2GEYJ103	10K	S
R312	ERJ2GEJ105X	1M	S
R313	ERJ2GEYJ681	680	S
R314	ERJ2GEYJ100	10	S
R315	ERJ2GEJ104	100K	S
R319	PQ4R10XJ820	82	S
R401	D0GA124JA004	120K	
R402	ERJ2GEJ153	15K	S
R403	ERJ2GEOR00	0	
R404	ERJ2GEJ153	15K	S
R405	D0GA823JA004	82K	
R406	ERJ2GEYJ103	10K	S
R407	ERJ2GEJ220	22	S
R408	ERJ2GEOR00	0	
R409	ERJ2GEJ331	330	S
R410	ERJ2GEYJ102	1K	S

Ref. No.	Part No.	Part Name & Description	Remarks
R411	ERJ2GEJ101	100	S
R412	ERJ2GEJ330	33	S
R413	ERJ2GEJ101	100	S
R417	ERJ2GEJ330	33	S
R421	D0GA123JA004	12K	
R423	ERJ2GEJ473	47K	S
R424	ERJ2GEJ104	100K	S
R603	ERJ2GEJ332	3.3K	S
R604	ERJ2GEJ682	6.8K	S
R605	ERJ2GEYJ102	1K	S
R606	ERJ2GEYJ102	1K	S
R607	ERJ2GEYJ102	1K	S
R608	ERJ2GEYJ102	1K	S
R610	ERJ2GEYJ103	10K	S
R611	ERJ2GEYF392	3.9K	S
R612	ERJ2GEJ122	1.2K	S
R614	ERJ2GEYJ223	22K	S
R615	ERJ2GEJ272	2.7K	S
R623	ERJ2GEJ471	470	S
R625	ERJ2GEYJ271	270	S
R626	ERJ2GEJ221	220	S
R630	ERJ2GEJ122	1.2K	S
R631	ERJ2GEJ122	1.2K	S
R632	ERJ2GEOR00	0	
R633	ERJ2GEYJ100	10	S
R634	ERJ2GEYJ100	10	S
R645	ERJ2GEJ331	330	S
		(OTHERS)	
E101	L0CBAB000104	MICROPHONE	

15.3.2. Charger Unit

15.3.2.1. Cabinet and Electrical Parts

Ref. No.	Part No.	Part Name & Description	Remarks
1	PSWE1CA256XU	ACCESSORY PARTS, CHARGER UNIT	
1-1	PSGG1021Z1	GRILLE	ABS-HB
1-2	PSKM1112Z3	CABINET BODY	PS-HB
1-3	PSKE1071Z1	GUIDE, CHARGE TERMINAL CASE	POM-HB
1-4	PSJT1051Z	CHARGE TERMINAL	
1-5	PQHX10991Z	CUSHION, URETHANE FORM	
1-6	PQMH10426Y	WEIGHT	
1-7	PSYF1049Z3	CABINET COVER	PS-HB
1-8	PSGT2735Z	NAME PLATE	△

15.3.2.2. Main P.C.Board Parts

Ref. No.	Part No.	Part Name & Description	Remarks
PCB200	PSWPTCA255CE	CHARGER P.C.BOARD ASS'Y (RTL)	
		(ICs)	
IC601	PQVIMC34063M	IC	
IC602	C0ABAA000088	IC	
		(DIODE)	
D601	MA738	DIODE (SI)	S
		(COIL)	
L601	G0A470EA0020	COIL	
		(JACK)	
CN601	K2EZ2B000044	JACK	
		(CAPACITORS)	
C601	EEEFK1E221P	220	
C603	ECJ1VC1H151J	150P	
C604	ECUV1H102KBV	0.001	
C605	EEE1EA101XP	10P	
C607	EEE1EA101XP	10P	
		(RESISTORS)	
R601	ERJ6GEYJ1R0	1	
R602	ERJ6GEYJ1R0	1	
R603	ERJ6GEYJ1R0	1	
R610	ERJ3GEYJ272	2.7K	
R610	ERJ3GEYJ272	2.7K	
R612	D1BB4702A055	47K	
R613	D1BB4702A055	47K	
R614	ERJ3EKF1001	1K	S
R615	ERJ3EKF1001	1K	S
R616	ERJ6ENF1R00	1	S
R617	ERJ6ENF1R00	1	S
R618	ERJ6ENF1R00	1	S
R619	ERJ6ENF1R00	1	S

15.3.2.3. Accessories and Packing Materials

Ref. No.	Part No.	Part Name & Description	Remarks
A201	KX-TCA1-2	AC ADAPTOR	△
A202	PSKE1093Z1	HANGER, BELT CLIP	PC+ABS-HB
A203	PSQX3990YCD	CD-ROM, INSTRUCTION BOOK	
A204	PSQX4001Y	INSTRUCTION BOOK, QUICK GUIDE	
A205	PSQX4060Y	INSTRUCTION BOOK, QUICK GUIDE	
A206	PSQW2272Z	LEAFLET, TAIWAN BATTERY	
P201	PQPP10084Z	PROTECTION COVER (for Hand-set)	
P202	PQPP10086Z	PROTECTION COVER (for Charger)	
P203	PSZKTCA256XU	GIFT BOX	

15.3.2.4. Fixtures and Tools

Ref. No.	Part No.	Part Name & Description	Remarks
	PSZZ2CA155EU	PC CABLE	

H
KXTCA256XUK