
Service Manual for Blue Angel

HTC Proprietary
Confidential Treatment Requested

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HTC Corp.
Engineering Mobility

TITLE: Service Manual

Revision Control Table						
REV.	DATE	CONTENTS	DEP.	REVISED	APP'D	STGE.PER.
AX01	Aug,16 2004	First Draft	Technical Support	Felix Lu		
AX02	Sep,7 2004	Update Antenna Test	Technical Support	Felix Lu		
A01	Sep,16 2004	Update Board Level & Labeling Plan	Technical Support	Felix Lu		
A02	Jan,06 2005	Update Antenna Spec & Image address for SD Card Backup	Technical Support	Felix Lu		
A03	Jun,22 2005	<ol style="list-style-type: none"> 1. Repair notice for Keypad (Qwerty) assembly (P.23). 2. Set screw driver torque to 0.9±0.05kgf-cm for unit assembly (P.26) 3. Run In test for NFF unit verification.(P.29) 4. Unit SPL updated (P.54). 5. Main battery label identification (P.63). 6. Updated board level SPL (P.71). 	Technical Support	Henry_Dal		

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1.Introduction

This manual provides the technical information to support the service activities of Harrier.

This document contains highly confidential information, so any or all of this document should not be revealed to any third party.

2.Product Specification

Platform

- Microsoft Pocket PC 2003 Phone Edition – English, Korean, Spanish, Traditional Chinese, Simplified Chinese, Italian, Portuguese, German
- Dimensions: Main unit 18.7mm(T) x 69.8mm(W) x 125mm (H)
- Weight (Main Unit) under 210g

Processor

- Low power, high performance 32-bit Intel PXA 263 CPU 400MHz (embedded 32MB NOR Flash)
- IT Calypso + IOTA, GSM/GPRS solution

Memory

- Flash ROM: 32/64/96MB
- Flash RAM: 64/128MB

LCD Module

- 3.5" Transflective TFT-LCD with back-light LEDs, 240 x 320 x 64K Colors
- Sensitive touch screen

GSM/GPRS functional block

- GPRS/GSM (Tri-band) module
- GSM900: 880-915, 925-960MHz, GSM1800: 1710-1785, 1805-1880MHz, GSM1900: 1850-1910, 1930-1990MHz
- Internal antenna for tri-band GSM
- Call holding, waiting, forwarding, barring, Calling Line Identity (CLI)
- SMS (Short Message Service), MT, MO, SM reply, replace, acknowledgement, validity, 8 bit SMS data class 0/1 SMS
- Display own number, telephone number storage capability w/Mute feature, Network selection, Cell broadcast
- Explicit Call Transfer (ECT), Spool icon, Phase 2 Unstructured supplementary service data-MO/MT
- WAV Ring tone download/compose, Long message (640 characters), Network Lock
- AMR/EFR/FR/HR, EOTD, CPHS v4.2, PBCCH
- GPRS class B, Multi-slot standard class 10

- 3V SIM operation, SIM Application Toolkit class 3, Release 00, Over the programming
- Security: Ciphering A5.1 & A5.2, PIN1 & 2 control

Stylus

- Lock type mechanism

Keyboard/button/switch

- One power button (Wake-up key)
- One voice recorder/voice command button (Wake-up key)
- One volume control button (up and down)
- One Camera capture button (Wake-up key)
- One 5-way navigation button (Wake-up key)
- Two phone buttons: SEND (Yes) & END (No) buttons (Wake-up keys) (with LED backlight)
- RESET switch
- Built-in 39 keys extractable QWERTY Keyboard (Wake-up key) (with LED backlight)
- Key lock
- 6 programmable AP buttons (1. Contacts 2. Calendar. 3. Start 4. Inbox 5. Menu 6. Done/OK) (Wake-up key)

Notification

- One bi-color LED (Green and Red) LED in the first lens for GSM standby, GSM message, GSM network status, PDA charging status, and PDA notification
- Two respective (Blue and Green) LEDs in the same second lens for Bluetooth/WiFi status
- Notification by Sound and Message on the display
- Vibrator for notification

Audio

- Built-in Microphone, receiver and speaker
- SW echo cancellation
- Loudspeaker
- SW echo cancellation, HW Full duplex
- Receiver
- 16-bits with 8KHz, 11KHz, 16KHz, 22KHz, 44.1KHz, 48KHz sampling rate [TBD]
- WAV/WMA/MP3 stereo

CMOS Camera

- Color CMOS camera module
- Resolution: VGA/QVGA/CIF/QQVGA
- JPEG encoder
- Fix Focus Function

- Preview mirror on battery cover
- Operation in 5 Lux (min.)
- Video Light [TBD]

Power

- **Battery**
 - ▶ Removable rechargeable Lithium Ion battery, 1400mAh (Typical)
 - ▶ Separated backup battery (20mAh, rechargeable)
 - ▶ Battery life: 15hrs of PDA only (without RF) [TBD]
 - ▶ Talk time of 3~5 hours (at nominal RF Tx power level)
 - ▶ Standby time: 200hrs
 - ▶ Data Retention Time: 72hrs
- **AC Adapter**
 - ▶ AC input: 100 ~ 240 Vac, 50/60Hz
 - ▶ AC input current: 0.2 Aac (max.)
 - ▶ Output voltage: 5Vdc (typical)
 - ▶ Output current: 2Adc (typical)

Environment

- Operating temp: 0 ~50 degree C. Humidity : 90% RH
- Storage tem: -20 ~ 60 degree C. Humidity : 90% RH

Peripheral Interface

- Feature connector (22 pin)- Serial, USB Slave, power signals and Audio (support Car kit)
- Infrared Port IrDA CIR (including remote control controller)
- One Audio Jack (2.5 ϕ)
- One R-UIM card slot
- One SDIO/MMC card slot (B-Square SDIO driver)
- One External antenna connector

802.11b Wireless LAN

- Frequency Range: 2.4GHz to 2.4835GHz
- Standards: IEEE 802.11b Direct Sequence Spread Spectrum compliant
- Data Rates with Automatic Fallback:: 11Mbps_CCK, 5.5Mbps_CCK, 2Mbps_DQPSK, 1Mbps_DBPSK
- Operation Channels: 1-11 for North America, 1-13 for Europe, 1-14 for Japan, 10-11 for Spain, 10-13 for France
- Encryption: 64-, 128- bit WEP standard data encryption
- Media Access Control: CSMA/CA with ACK
- Network Architecture: Ad-Hoc Mode (Peer to Peer without Access point), Infrastructure Mode (Communications to wired)

networks via Access Points with Roaming)

- Antenna: Internal antenna

Bluetooth

- Bluetooth 1.1 compliant
- Class 2 transmit power-support voice and data transmission

Accessories

- Sync. Cable (USB/Serial)
- Cradle (USB, Serial)
- AC adapter
- Car adapter
- Stylus
- AC adapter power plug
- Car Kit (capable of muting car stereo when incoming call or call proceeding)
- Stereo Wired headset-stereo earpiece with microphone
- Mono Wired headset-mono earpiece with microphone
- Mono Bluetooth headset-mono earphone with microphone
- Optional Battery (1400mAh)
- VGA/TV out kit (through USB interface, with AC input, remote control for presentation)
- Remote kit with FM Radio Tuner
- Remote Controller for VGA output
- WiFi SD card
- TTY Adapter

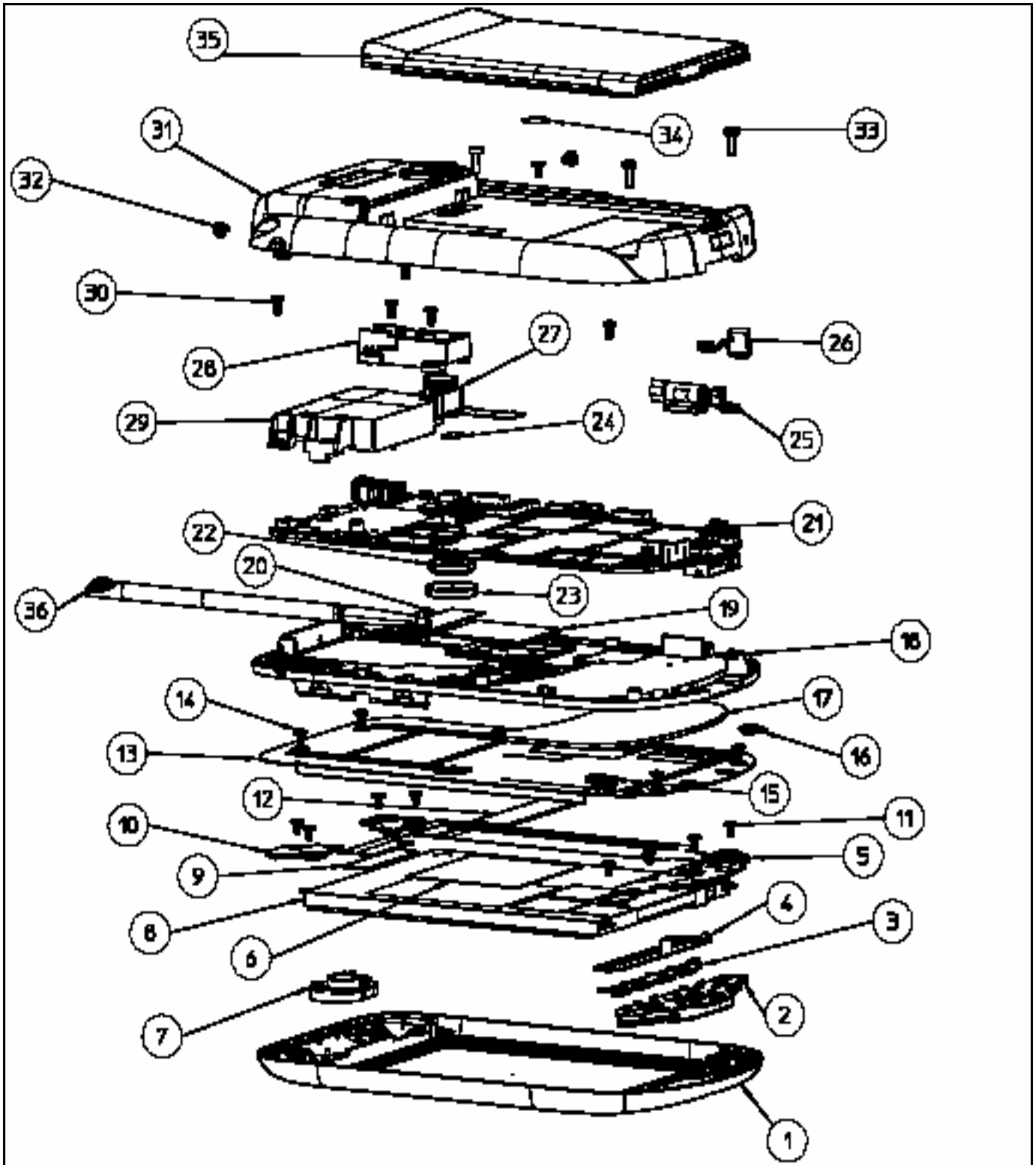
Regulatory

- NTSL, BQCF Certification, USB v1.1 Compliance test, JAVA TCK
- R&TTE : EMC/SAR
- CDG 1, 2, and 3

Applications

- JAVA Virtue Machine (J2ME, CLDC, MIDP 2.0, JAM)
- WAP 2.0 browser
- MMS (with video clip support)
- Camera Capture Utility (Resolution: VGA/QVGA/CIF/QQVGA)
- Image Viewer/Album, Voice Recognition, Text to Speech, Photo ID, SIM Manager, SD Backup, Wireless Modem, Universal Remote Controller, Polyphonies MIDI ring tone, Instant Message

3. Exploded Diagram



4. Assembling and Disassembling

4.1 Disassembling



Tools needed for Assembling and Disassembling.


1. Lens Cleaning Tissue.
2. Philip Screw Driver 000X50
3. Philip Screw Driver 000X40.
4. Torex Screw Driver T6X40
5. Torex Screw Driver T5X40
6. Tweezers.(Suggest to use plastic made)



1. Pull up to release the Stylus.
2. Remove the SD Card Filler.
3. Remove the Antenna Insert Rubber.



Unlock the fixing lock, then take out the battery as indicated on the left.

 **Warning:** To reduce risk of fire or burns, do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water. Replace only with specified batteries. Recycle or dispose of used batteries properly.





There are **4 screws** at the rear side of the unit.

Note that there is 2 types of screws are used.

The P/N would be as follows:

1. 72H00642- 00M

2. 74H00441- 00M

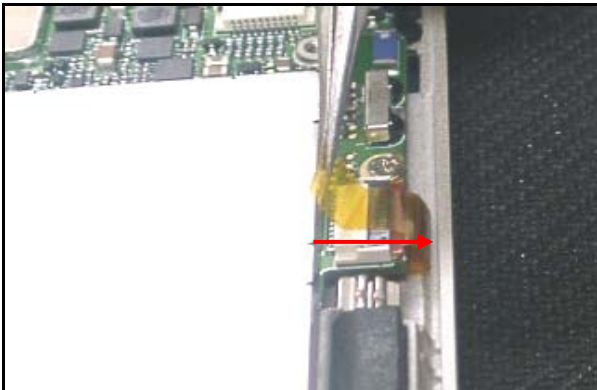


To open de case, remove **2 more screws** surrounding the side of the unit as indicated on the left.

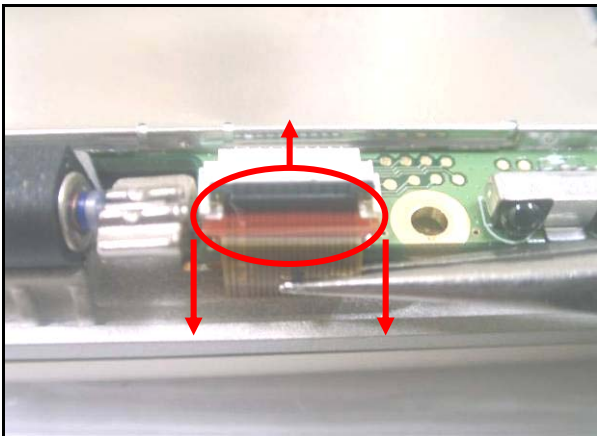
Note that screw P/N is **72H00642- 00M**.



Once the 6 screws have been removed, Use fingers to open the housing.

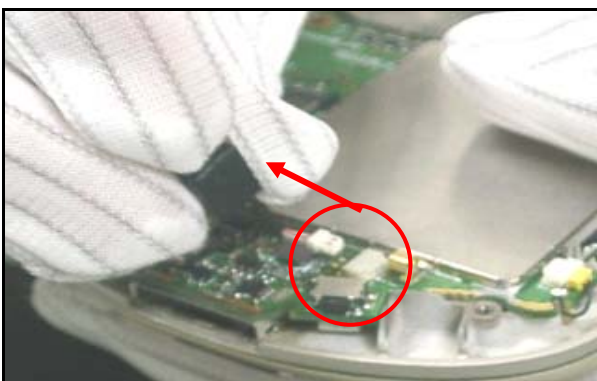


Use tweezers to tear down the tape on Keyboard FPC and connector as indicated on left.



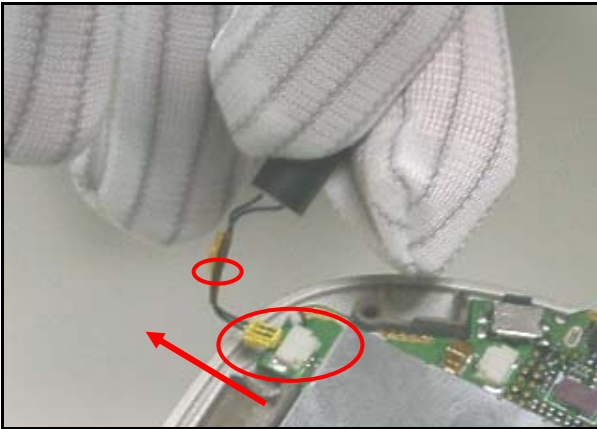
Next, remove the K/B FPC, unlock the connector lock with a tweezers. (Suggest to use plastic made)

For K/B FPC, to lift the connector lock upwards from both ends at the same time as indicated in the picture. The angle must not exceed 90 degrees.



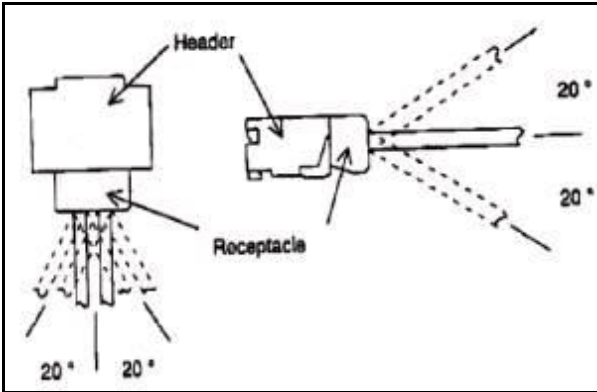
If the microphone is defective, remove it from main board and then replace new one.

Note: when disconnect the wire of Microphone and Vibrator. The angle must be within 20 degrees to mating axis.

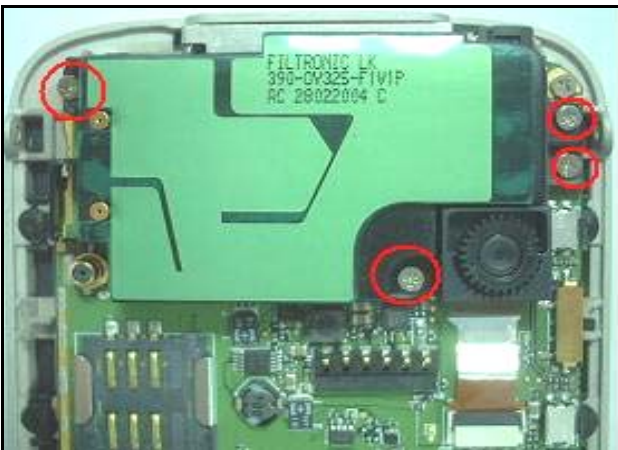


If the vibrator is defective, remove it from main board and then replace new one.

Note: when disconnect the wire of Microphone, and Vibrator. The angle must be within 20 degrees to mating axis.

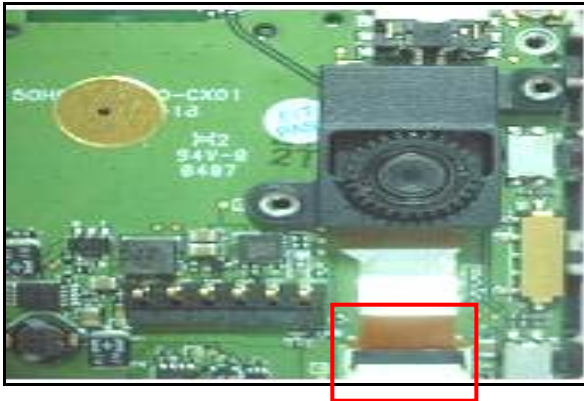


Note: when disconnect the wire of Microphone, and Vibrator. The angle must be within 20 degrees to mating axis.



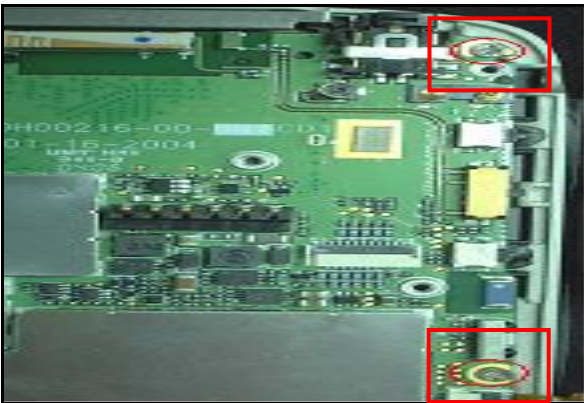
There are 6 screws on main board. Firstly, to remove 4 screws to disassemble main board from bezel.

Note that screw P/N is **72H00528-00M**.



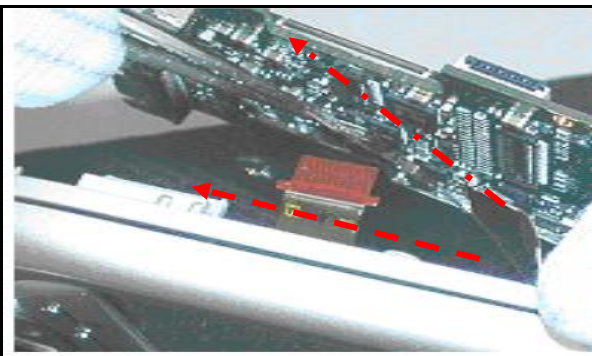
Next, remove the camera FPC, unlock the connector lock with a tweezers.

For Camera FPC, to lift the connector lock upwards from both ends at the same time as indicated in the picture. The angle must not exceed 90 degrees.

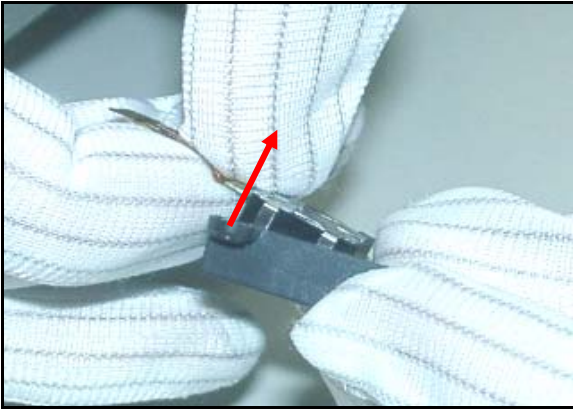


Unfasten the 2 screws to disconnect the main board from Housing Frame as indicated on the left.

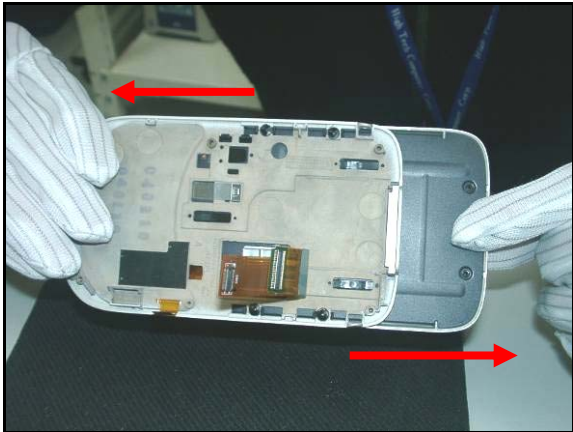
Note that screw P/N is **72H00528-00M**.



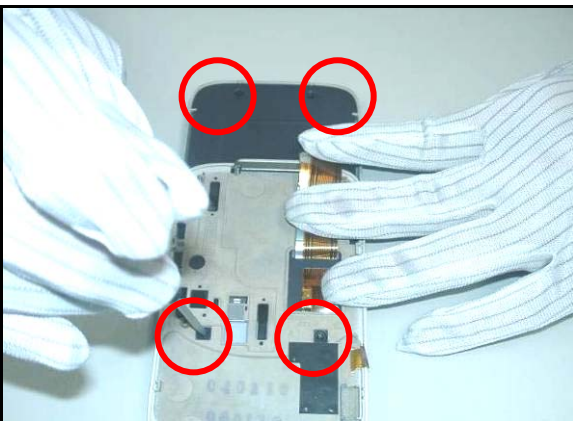
Next, pull up the main board in 30 degrees to disconnect LCD FPC and Touch Panel FPC with tweezers.



Take out the camera from camera holder as indicated on the left.



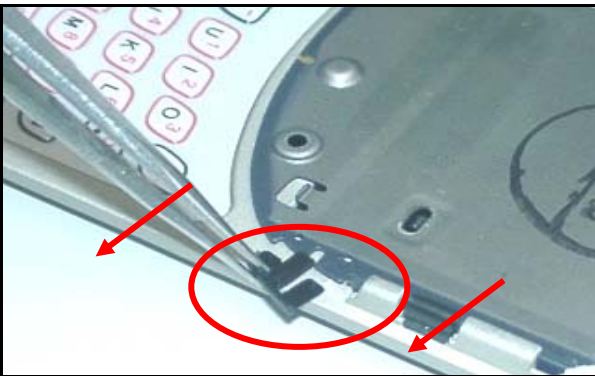
Pull both sliding frames to the end as indicated on the left.



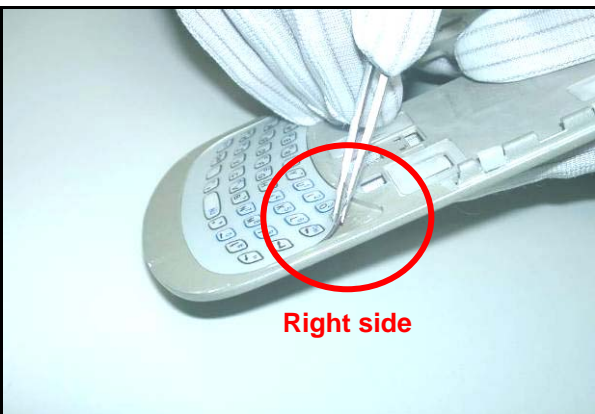
Remove 4 screws on frame bezel to disassemble frame housing from bezel assembly.



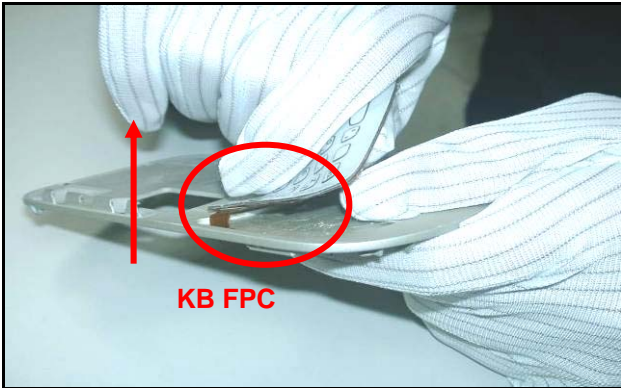
To disassemble bezel-assy & frame-assy.



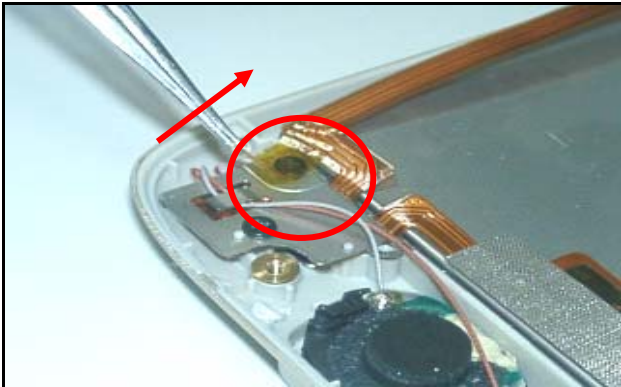
Use tweezers to pull out the frame spacers to
Disassemble frame bezel & frame housing.



Use tweezers to tear down the keypad from its right
side as indicated on the left.



Next, to pull up the FPC to separate from bezel frame.



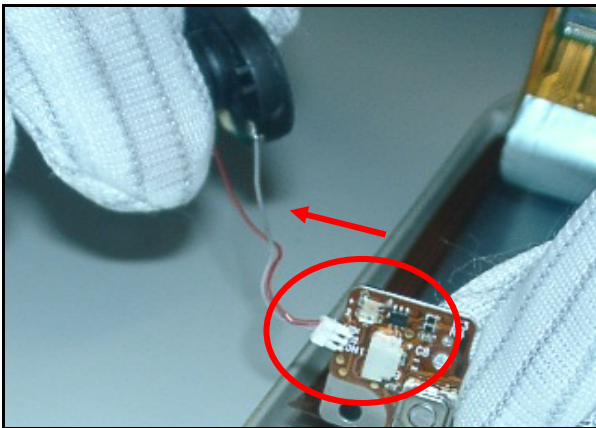
Use tweezers to tear down the tape on the upper right location.



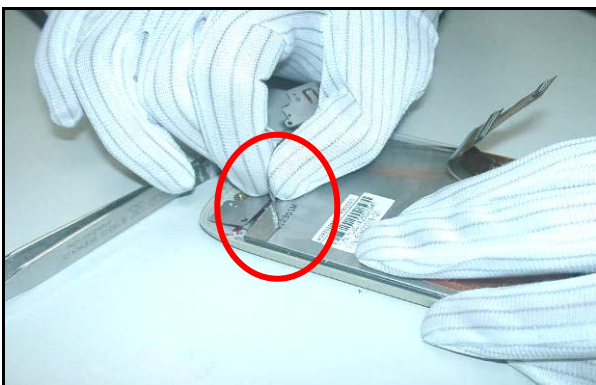
Unfasten 2 screws on the upper right location.



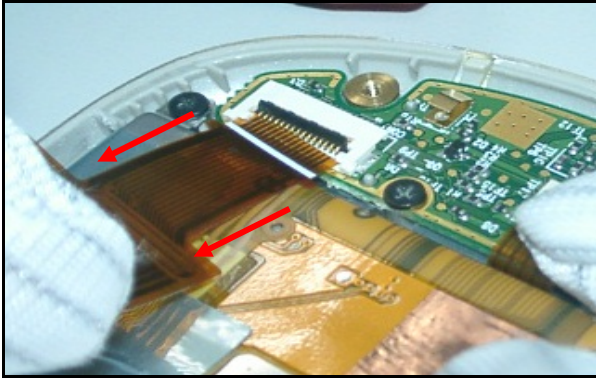
If the speaker is defective, take out the speaker from the bezel and its wire from the hook, and then to replace new one.



Note: when disconnect the wire of Speaker. The angle must be within 20 degrees to mating axis.

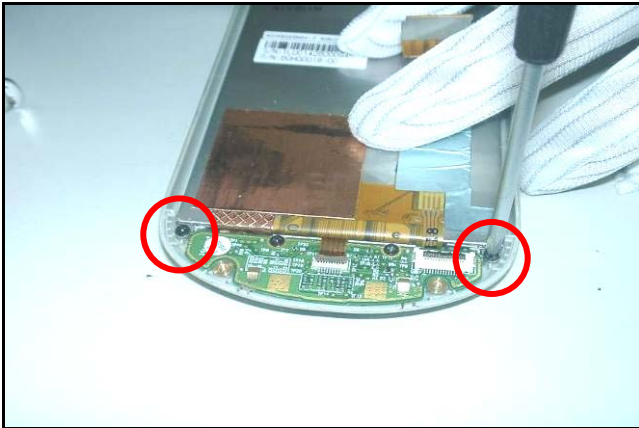


Unfasten 2 screws on the upper left location and, then tear down the gasket on the FPC of switch board as indicated on the left.

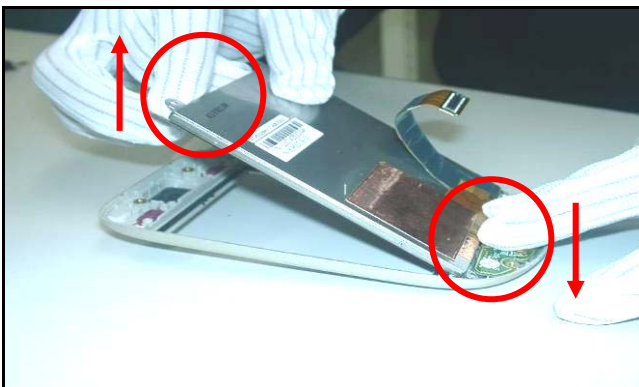


Next, remove the switch board FPC, unlock the connector lock with a tweezers.
(Suggest to use plastic made)

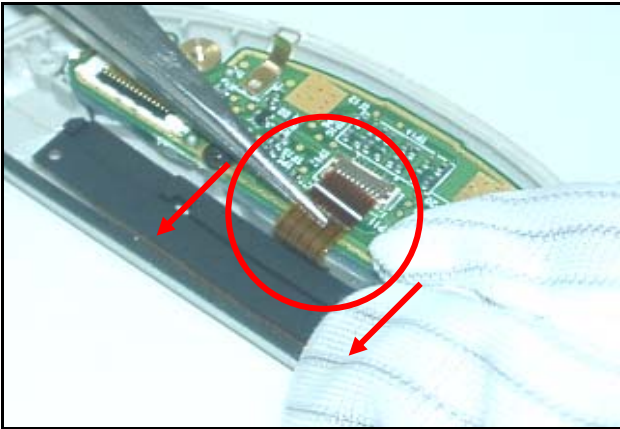
For S/W FPC, to lift the connector lock upwards from both ends at the same time as indicated in the picture. The angle must not exceed 90 degrees.



Unfasten 2 screws at both sides of lower location of bezel as indicated on the left.

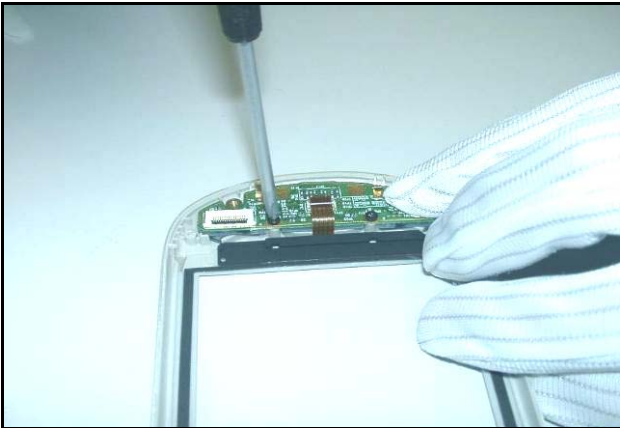


Next, to separate the LCD from the bezel as indicated on the left.

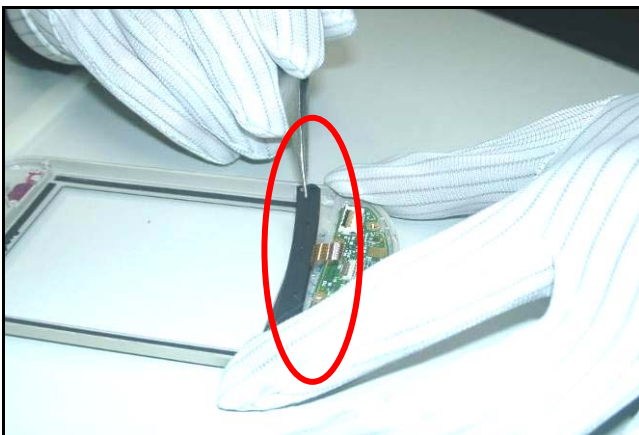


To remove the softkey FPC, unlock the connector lock with a tweezers.
(Suggest to use plastic made)

For softkey FPC, to lift the connector lock upwards from both ends at the same time as indicated in the picture. The angle must not exceed 90 degrees.



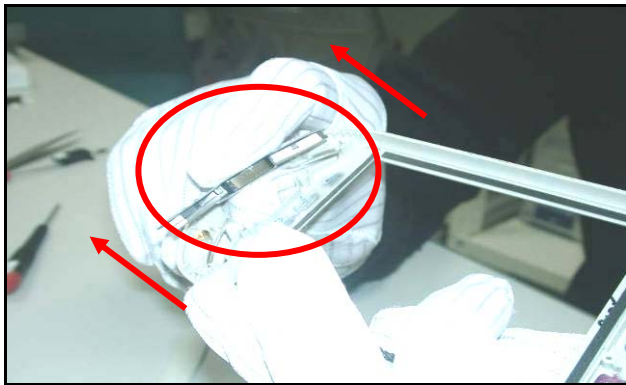
Unfasten 2 screws on the switch board.



Use tweezers to take out the softkey module pre-assembly.



Use fingers to take out the switch board.



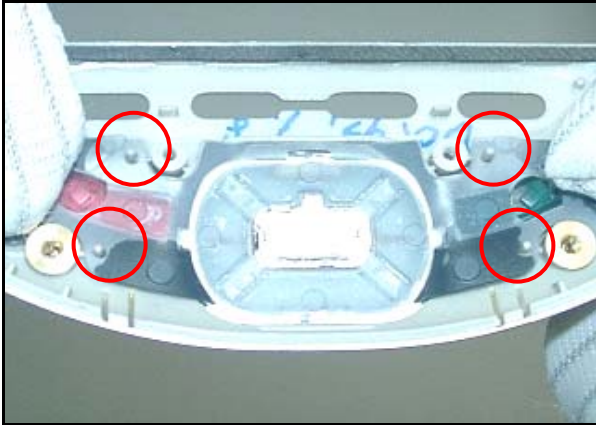
Take out the Action button from the obverse side as indicated on the left.



Use tweezers to take out the softkey button as indicated on the left.

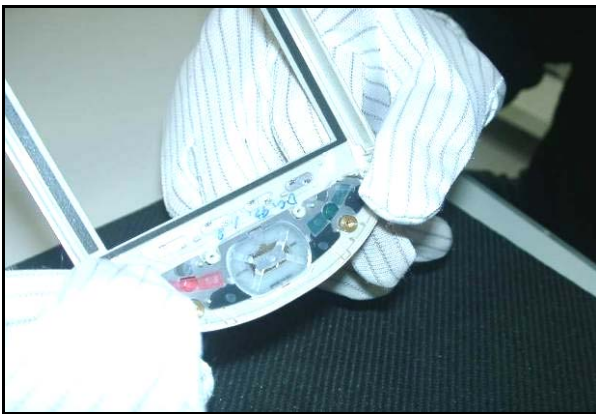
The Unit Disassembly is done already.

4.2 Assembling



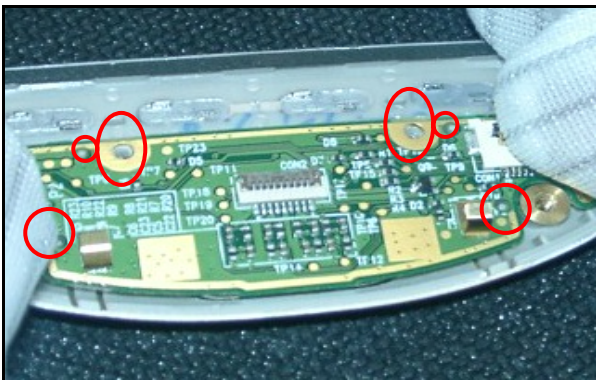
Put the Action Button on the bezel.

Note: there're 4 guide pins on bezel, so please aim at them when the Action Button is put on it.



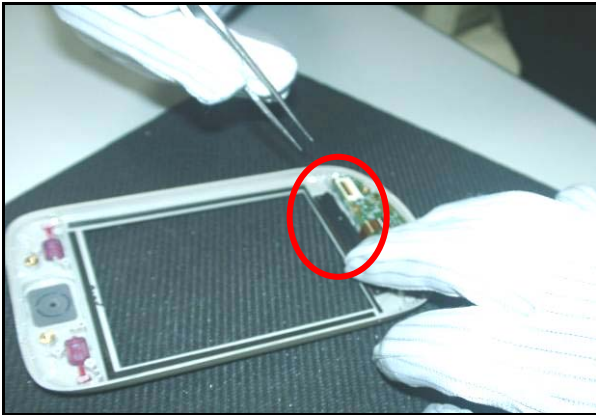
Put the Softkey Button on the bezel.

Note: there're 4 guide pins on bezel, so please aim at them when the Softkey Button is put on it.



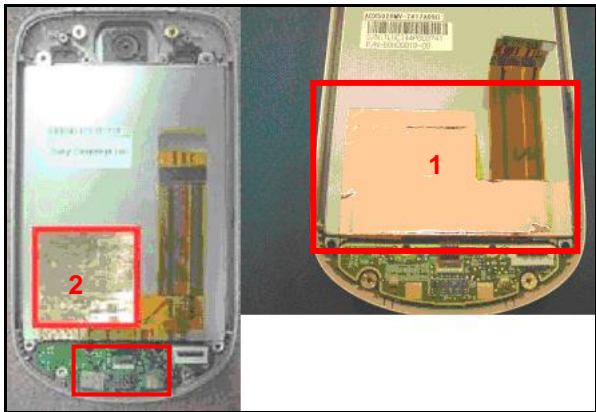
Put the switch board on Action button and fasten 2 screws as indicated on the left.

Note: there're 4 guide pins on bezel, so please aim at them when the S/W board is put on it.



Put the softkey FPC pre-assembly on the softkey button.

Note: there're 2 guide pins on softkey button, so please aim at them when the S/W board is put on it.

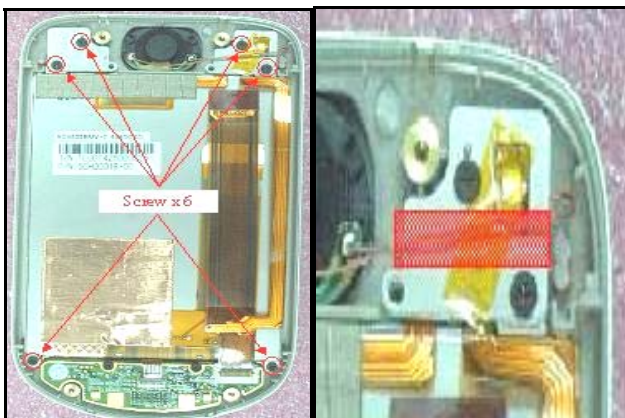


(1)To assemble the LCD with bezel, and then insert softkey FPC into connector of S/W board as indicated on the left.

Note: if a new LCD needs to be replaced, please paste two copper foils before assembly.

1.The copper foil P/N: 72H00717-00M

2.The copper foil P/N: 72H00600-00M



1. Put on the S/W board FPC pre-assembly, and then fasten two screws on upper left side and two screws on bottom of right and left side.
2. Put on the speaker, and then plug in the connector and make its wire fix in the hook.
3. Fasten two screws on upper right side, and then paste the proof-tape as indicated on the left.



1. Insert S/W board FPC into the connector of S/W board.
2. Paste the gasket on the LCD as indicated on the left.

The Gasket P/N is 72H00539-00M.

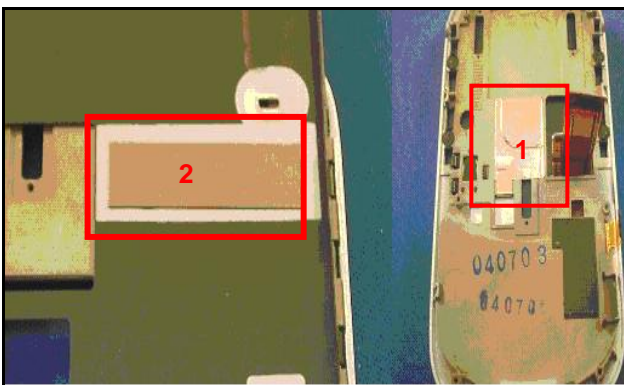


Keypad (Qwerty) Assembly

Insert the keypad FPC, and then remove the paper to paste it on the frame bezel.

[Note]

Replace new Keypad (Qwerty) if it's bad; please remove the twin adhesive paper before paste the keypad on frame bezel.



It is required to paste a gasket and a copper on both side of housing frame and bezel frame as indicated on the left.

1.Copper foil P/N: 72H00716-00M

2.Gasket P/N: 72H00714-00M

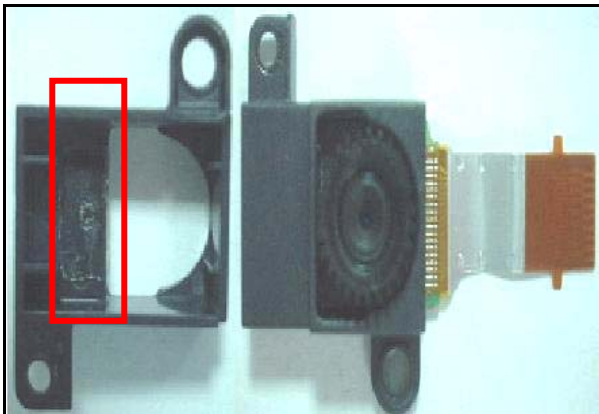


Frame Assembly

Insert frame housing into frame bezel, and then insert the two spacers on both sides to lock the frame assembly as indicated on the left.

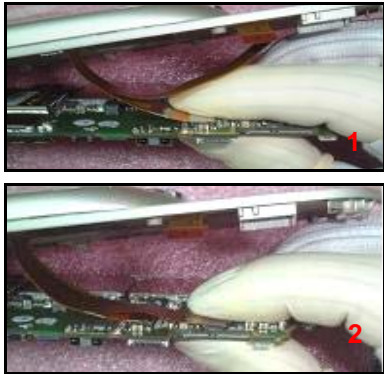


Insert the S/W board FPC into frame assembly, and then fasten 4 screws.

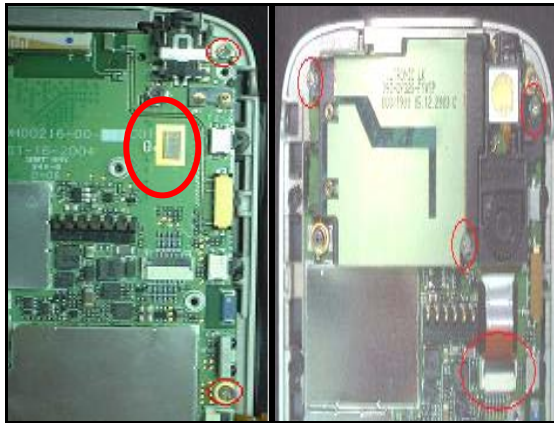


Camera Module Assembly

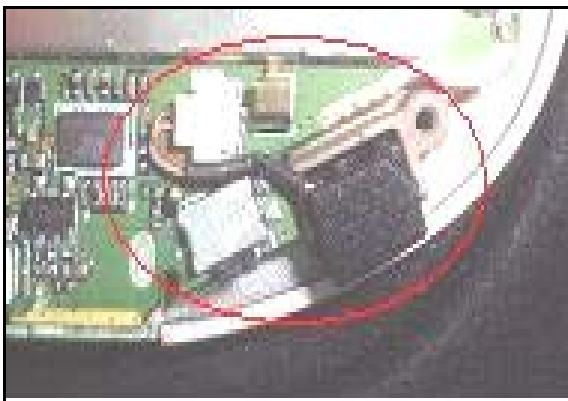
1. Remove tape on camera holder.
2. Insert the camera into camera and fix it on camera holder.



1. Insert the LCD FPC on main board.
2. Insert the switch board FPC on main board.



1. Put on the main board and fasten 2 screws.
2. Assemble antenna and camera module with main board, and then fasten 4 screws to fix it.
Please paste the gasket on main board before assembly.
3. Insert the camera FPC into connector.



1. Assemble the microphone on main board and please pay attention on the wire location.

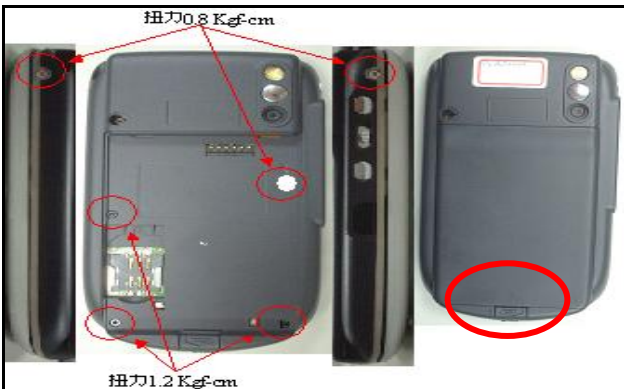


Assemble the vibrator on main board and please pay attention on the wire location.

The wire location is beneath main board as indicated on the left.



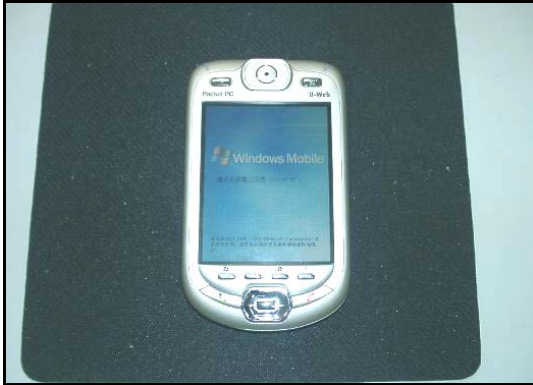
Insert the keypad FPC into the side connector of main board, and then paste the soldering-proof tape on it as indicated on the left.



1. Assemble the housing, and then fasten 4 screws on rear back of unit and 2 screws on the side of unit.
2. Paste the warranty seal on the housing.
3. Insert the battery, and then push fixing lock.

[Note]:

- 1. Set screw driver torque to $0.9 \pm 0.05 \text{kgf-cm}$.**
- 2. Please set the volume button on the center before assembly.**



The Unit Assembly is done already.

5. Diagnostic Program and Win CE test item

5.1 Tools required

SD card with Diagnostic program loaded.

5.2 How to enter Diagnostic Program

- (1) Insert SD card with Diagnostic program loaded to the unit.
- (2) Press and hold Power + Record + Reset to enter diagnostic mode to perform the test.

5.3 List of Diagnostic / WinCE Test Items

Diagnostic Program Mode				
No	Item	Description	Remark	
1	SDRAM Test	Check SDRAM Size/Write/Read		
2	Display Test	Test the LCD display quality		
3	Button Test	Test the function of hot key		
4	Keyboard Test	Test the function of button on Keyboard		
5	Touch Panel Test	Touch screen alignment test. Suggest to test in WinCE		
6	Checksum Test	Verify the checksum of the ROM code for manufacturing		
7	Brightness & LED Test	Blight ON with in different brightness level and LED test		
8	Playback Test	Playback function test		
9	Recording Test	Recording function test		
10	Timer Test	Check the function of Real Time Clock		
11	SD Card Test	SD card Write/Read Test		
12	Vibrator Test	Test the function of the vibrator		
13	Battery Test	Check battery status		
14	View Unit Info	Check Unit S/N		
15	Clear Talk Time	a. Clear call duration (Talk Time) b. M-system format (Clear all data in memory)		
Win CE mode				
No	Item	Description	Remark	
1	USB Test	Suggest to test in Windows CE		
2	SIR Test	Suggest to test in Windows CE		
3	Series Test	Suggest to test in Windows CE		
4	Wi-Fi Test	Suggest to test in Windows CE		

[Note]: Clear Talk Time

1. The test for the unit returns from field which needs to go through [Refurbishment](#) process.
2. This is process is very import to clear out the [PIN-data](#) in memory.

5.4 List of Run In Test Items (for NFF unit verification)

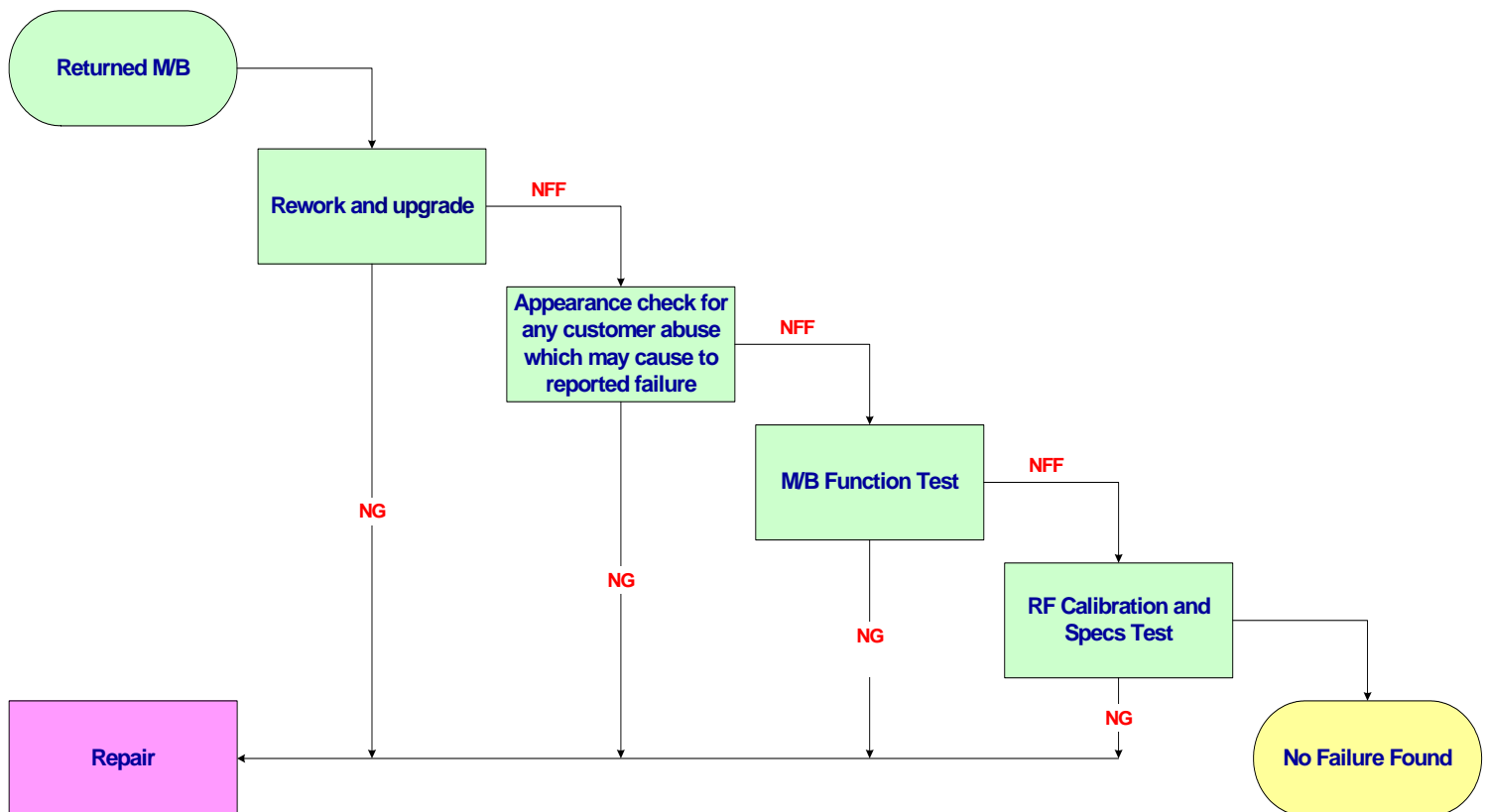
- (1) For NFF unit verification, tie test condition for unit.
- (2) Insert SD card with Diagnostic program loaded to the unit.
- (3) Press and hold Power + Record + Reset to enter diagnostic mode to perform the test.
- (4) Select Run in test and press soft1 (2hour) for test time selection.

Run-In Test	No	Item	Description	Remark
	1	Timer Test	Check the function of Real Time Clock	Reliable test for CND unit
	2	Vibrator Test	Test the function of the vibrator	
	3	SDRAM Test	Check SDRAM Size/Write/Read	
	4	Brightness & LED Test	Blight ON with in different brightness level and LED test	
	5	Display Test	Test the LCD display quality (R/G/Blue/W/Black pattern)	
	6	Playback Test	Playback function test	

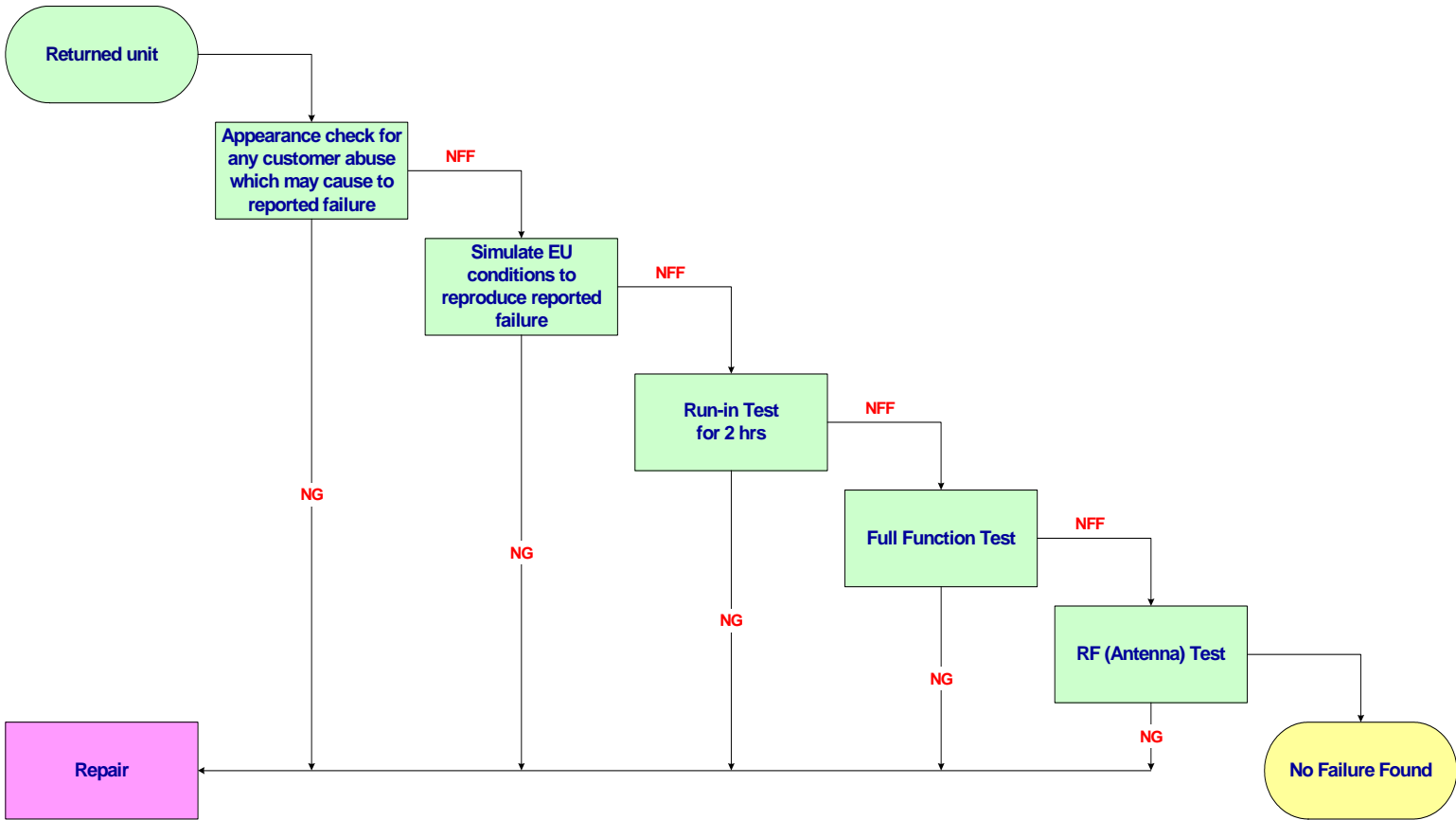
◆ **NFF definition:**

- Could not reproduce faulty symptom reported by end user.
- Could not find any functional failure after functional test, RF test (if needed) and cosmetic check

◆ **M/B NFF verification flow chart:**



◆ Unit NFF verification flow chart:



5.5 Test Items Operation

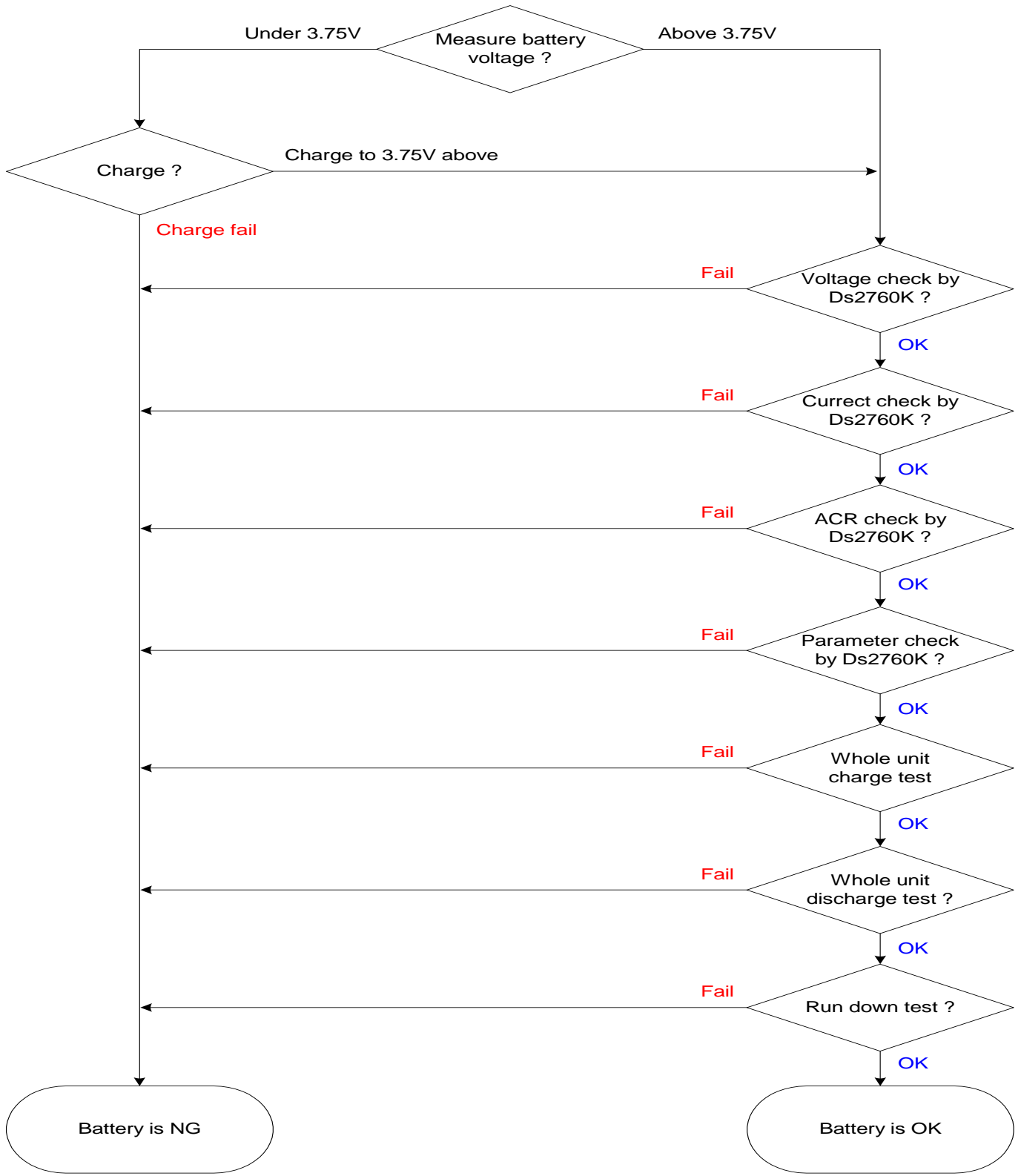
(1) How to select test item: Using navigation button -"Up" or "Down" to select the test items

(2) How to execute the test program: Press "Action" button to start each of test items.


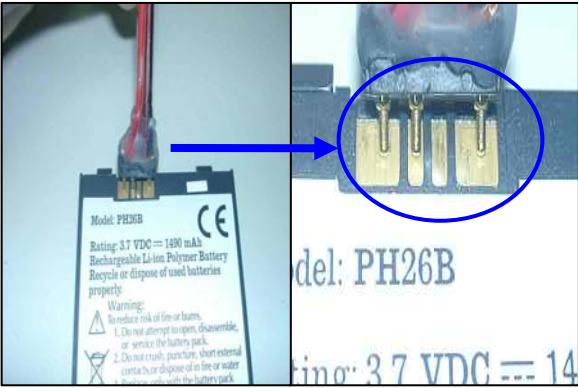

Diagnostic Program Mode	No	Item	Description
	1	SDRAM Test	Display Size and read/write test. It will show OK if pass. Stop on fail.
	2	Display Test	Unit prompts for different display page to detect the defect of LCD, lines or dots. First display is Multiple Color, Press Action to White Color Press Action to Dark Color Press Action to return Test Menu
	3	Button Test	Press each button to know if it works. Follow the instruction shown on the screen to finish the test item. Stop on fail.
	4	Keyboard Test	Press each button on keyboard to test if it works. Stop on fail.
	5	Touch Panel Test	Tap the cross mark (+) with stylus on the correct location. Fail if no reaction.
	6	Checksum Test	Verifies the checksum of the code for manufacturing.
	7	Brightness & LED Test	Press "Action to test LED and brightness level of LCD (three stages), and then return Test Menu.
	8	Playback Test	Press Action to test the audio out from Internal speak/earphone.
	9	Recording Test	Press Action to record the sound and then play out from speak/ earphone.
	10	Timer Test	Check the Real Time Clock if it works. Stop on Fail.
	11	SD Card Test	Press Action to test Read/Write for SD card.
	12	Vibrator Test	Press Action, unit should vibrate, and then press Action to return Test Menu.
	13	Battery Test	Check the battery charging and capacity status.
	14	View Unit Info	Check the unit S/N for warranty period judgment.
	15	Clear Talk Time	a. Clear call duration (Talk Time) b. M-system format (Clear all data in memory)
Win CE mode	No	Item	Description
	1	USB Test	Plug USB cable to connect UUT to PC then and check if USB OK or not.
	2	SIR Test	Use a device that can support SIR function to connect UUT.
	3	Series Test	Plug serial cable to connect UUT to PC then and check if serial OK or not.
	4	Wi-Fi Test	Connect the UUT via wireless AP to surf Internet.

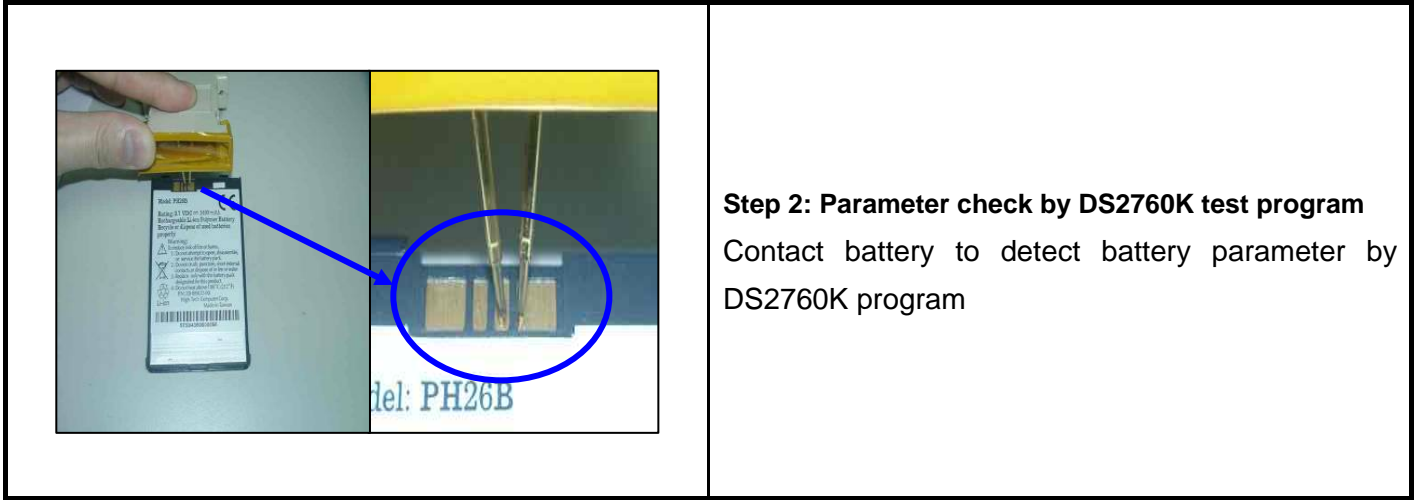
6. Main Battery Re-certify Procedure

6.1 Flow Chart

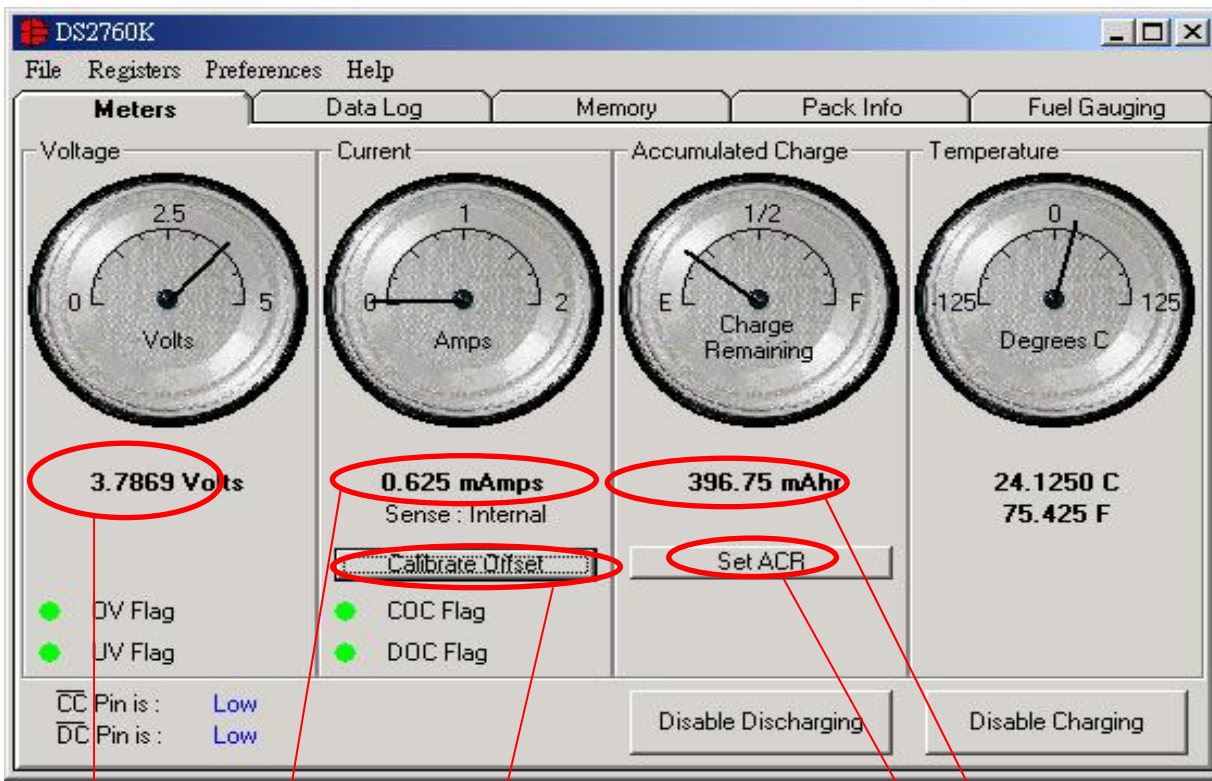


6.2 Measurement Procedure

	<p>Tools requirement:</p> <ul style="list-style-type: none"> A. Battery testing fixture B. Multi-meter with battery detecting plug C. Win2000 or above OS PC system D. Ds2760K battery testing program. <p>Note: The Ds2760K program needs to be installed onto PC in advance.</p>
	<p>Step 1: Main battery voltage check</p> <ul style="list-style-type: none"> a. To detect battery voltage by multi-meter through battery connector.
	<ul style="list-style-type: none"> b. The battery voltage will appear on the multi-meter, make sure the voltage $\geq 3.75V$ Above (keep connecting the battery, about 2 second later, the voltage will become "0", it is normal situation) <p>If the voltage $< 3.75V$ please charge the main battery and then re-check the battery voltage must $> 3.75V$.</p>



The battery's core parameter areas as follows:

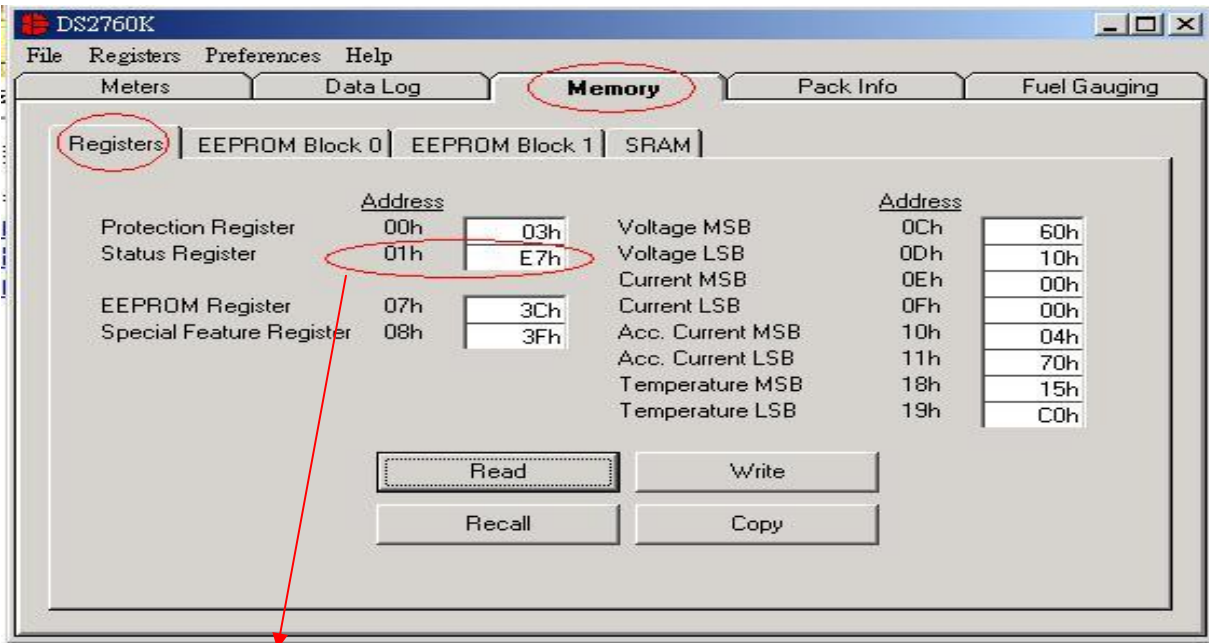


Voltage must > 3.75 V
And = step 1 (+0.15 V)

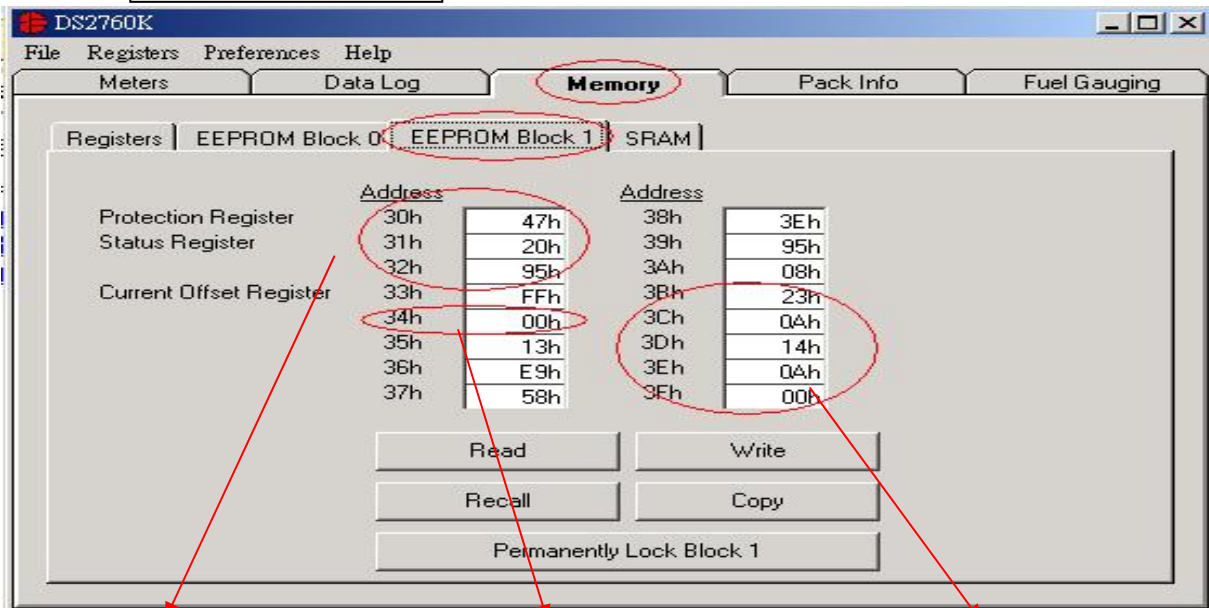
It should have the value within + 3.125 ~ -3.125 mAmps

If current is not between + 3.125~ -3.125 mAmps, Must to Click "Calibrate Offset " button, , the value will be calibrated automatically. (it takes about 15 seconds)
Purpose: make the current of sleep mode correct.

Compare Voltage and ACR value
Voltage must >= 3.75 V
Accumulated charge must >= 300 mAhs
If < 300mAh, Must to Click "Set ACR " button then re-fill out ACR value to be 300mAh



Check address of 01h
Must
01h = E7h



Check address of
30h/31h/32h
Must
30h = 47h
31h = 20h
32h = 95h

Check address of 34h
Must
34 = 00h

Check address of Bh/3Ch/3Dh/3Eh/3Fh
Must
3Bh = 23h
3Ch = 0Ah
3Dh = 14h
3Eh = 0Ah
3Fh = 00h



Tools requirement:

- E. Battery testing fixture
- F. Multi-meter with battery detecting plug
- G. Win2000 or above OS PC system
- H. Ds2760K battery testing program.

Note: The Ds2760K program needs to be installed onto PC in advance.



Step 1: Main battery voltage check

- c. To detect battery voltage by multi-meter through battery connector.

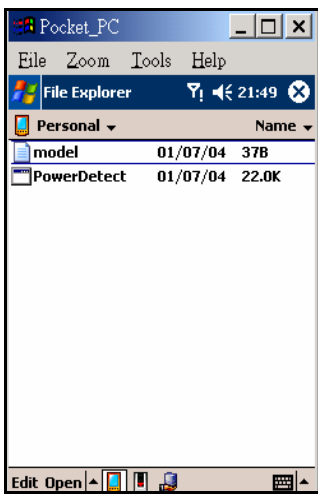
6.3 Battery Rundown Test Procedure

(A) Tool Requirement:

- (1) Windows 2000 or above
- (2) Battery Rundown Software
- (3) USB Cable or Cradle
- (4) ActiveSync3.7 or above

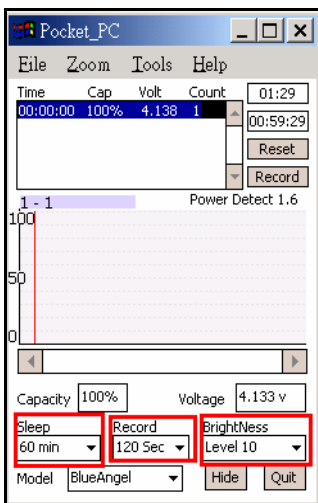
(B) Please charge your unit to full capacity for battery (4 hours) before doing the test.

Step 1: It is required to save **powerdetect.exe** and **model.txt** in the same folder under WinCE via ActiveSync.

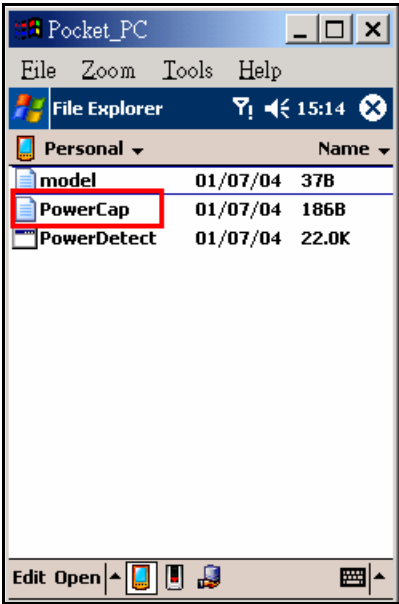


Step 2: It is unnecessary to adjust power management setting by using rundown test program.

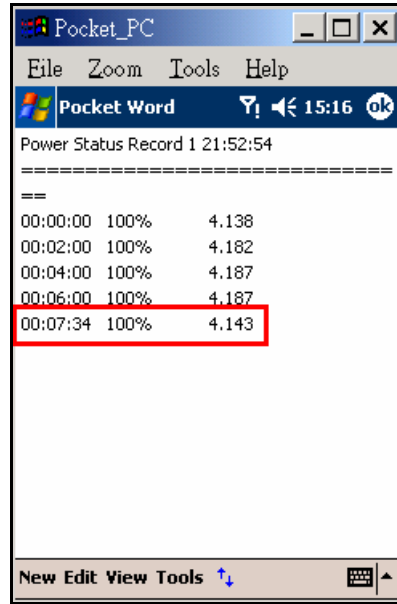
Step 3: Execute **powerdetect.exe** under WinCE, it will enter Sleep Mode after one Hour and generate a file named **powercap.txt** log.



→Record every two minutes & adjust the brightness to maximum.



Powercap.txt



Benchmark is 78%

Step 4: Tap powercap.txt log to check if the rest battery capacity. If under 78%, please replace a new battery.

7. Cosmetic Inspection Criteria

7.1. Definition of Cosmetic Standard

B Standard is for refurbishment inspection.

7.2. Visual Inspection Requirements

7.2.1 Examination of the device shall be made with workbench light turned on.

Ambient illumination is to be 500-1000 lux.

7.2.2 The inspector shall examine the device at a distance of 13 to 15 inches for approximately 7 seconds.

7.2.3 If a visual defect is noted, the inspector shall have an additional 10 seconds to closely examine the defect and classify it according the criteria table.

7.3. Definitions of Inspection Defects and Areas

Scratch : A linear cut that penetrated beyond the surface of the material.

A scratch can be felt by running your finger over it.

Dot / Dent : A recessed spot or void in the surface of the material.

Lint : A linear foreign object beyond the surface of the LCD.

Bump : A hump in the surface of material.

Area I : LCM, Bezel including phone key, APP button, action key and LED lens.

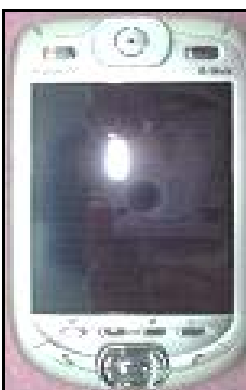
Area II : Keyboard, Housing, back side of battery, antenna cover, release button, stylus and side buttons.

Area III : Inner side of battery (not include battery), inside of SD connector, inside of USB port inside of Earphone jack and other area marked in the figure below.

D: Diameter/ **L**: Length/ **W**: Width/ **Number**: Number of defects/ **S**: Distance of dot to dot

Remark: 1. Crack is not allowed. 2. All dimensions in millimeters.

Area I



Area II



Area III



7.4. Cosmetic Criteria Table

	Specs Item	B standard (Refurbishment specs)		Specs Item	B standard (Refurbishment specs)
LCM*	Bright dot**	Red + Green + Blue \leq 4 dots	Area 3	Scratch	1) L \leq 10mm, W \leq 0.4mm 2) Total number \leq 7
	Dark dot**	Dark dots \leq 3		Spot	1) D < 0.7mm, S \geq 10mm 2) Total number \leq 6
	Dark or Bright line	None		Dent	1) D < 0.7mm, S \geq 10mm 2) Total number \leq 6
	Scratch	Total scratch number \leq 7		Bump	1) D < 0.7mm, S \geq 10mm 2) Total number \leq 6
	Lint	Total number \leq 5		Bur	1) L \leq 3mm, W \leq 0.254mm 2) No Hand Scrape
	Particle	Total number \leq 5			
	Breakage on T/P	None	IR Cap	*Scratch	1) L \leq 4mm, W \leq 0.3mm 2) Total number \leq 3
Area 1	Scratch	1) L \leq 3mm, W \leq 0.2mm 2) Total number \leq 4	Stylus	Scratch	1) L < 2mm, W < 0.2mm 2) Total number < 3
	Spot	1) D < 0.5mm, S \geq 15mm 2) Total number \leq 4		Protruding over the top of bezel	None
	Dent	1) D < 0.5mm, S \geq 15mm 2) Total number \leq 4		Deformed/ Missing/ Loosen	None
	Bump	1) D < 0.5mm, S \geq 15mm 2) Total number \leq 4	Gap	Gap between touch panel and bezel (Skip corner)	Gap < 0.85mm
	Bur	1) L \leq 3mm, W \leq 0.254mm 2) No Hand Scrape		Gap between bezel and housing	Gap < 0.75mm
	Imprint mark	1) 0.4 \leq D \leq 0.8 (mm) 2) Total number \leq 3		Buttons on the bezel	Button needs to be pressed smoothly
	Bright mark	1) L \leq 2.5mm, W \leq 0.25mm 2) Total number \leq 4		Navigation button	Button needs to be pressed smoothly
Area 2	Scratch	1) L \leq 7mm, W \leq 0.5mm 2) Total number \leq 5	Gap	Gap between housing and battery, battery and battery lock	Gap < 0.5mm
	Spot	1) D < 0.6mm, S \geq 15mm 2) Total number \leq 6		Gap between keyboard and housing	Gap < 0.6mm
	Dent	1) D < 0.6mm, S \geq 15mm 2) Total number \leq 6		Gap surrounding the buttons on the side	1) 0.05mm < Gap < 0.6mm 2) Button needs to be pressed smoothly
	Bump	1) D < 0.6mm, S \geq 15mm 2) Total number \leq 6			
	Bur	1) L \leq 3mm, W \leq 0.254mm 2) No Hand Scrape			
	Imprint mark	1) 0.4 mm \leq D \leq 0.8mm) 2) Total number \leq 3			
	Bright mark	1) L \leq 3.0mm, W \leq 0.25mm 2) Total number \leq 6			

* The total of LCM defect number must be less than 11 counts.

** The total of defected dots (bright dot and dark dots) must be less than 5.

8. OS, GSM & Extended ROM Image Re-flash Procedure

System Requirement:

- Windows 2000
- USB Cable or Cradle
- MTTY.exe
- Master Unit with most update Rom Code
- 64 MB SD/MMC card or Mini SD card

Caution: The unit must have at least 70% of battery capacity before starting the re-flash process. Charge the battery in advance if necessary.

Note: For the master unit, you could prepare it on these following ways:

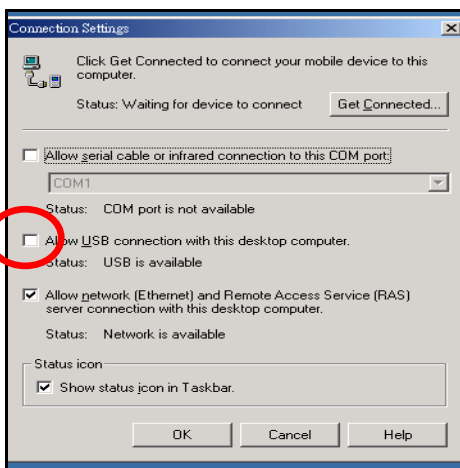
- Take one from Swap unit with most update Rom Code.
- Build one first by connecting to customer web for OS Upgrade/ Download Via RUU.

A. Upload most update code from master unit to SD /MMC card.

(You Only need to do this ONCE when New Update is received)

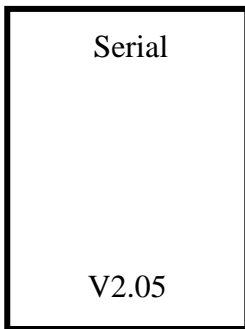
Requirement: (1) Mtty.exe tool ver.116 (2) USB cable or USB cradle (3) Window2000 or above (4) Master unit with most update ROM image

1. Uncheck USB and COM1 in Connection Settings in ActiveSync if you have installed the ActiveSync in your PC and make sure the USB port is available.

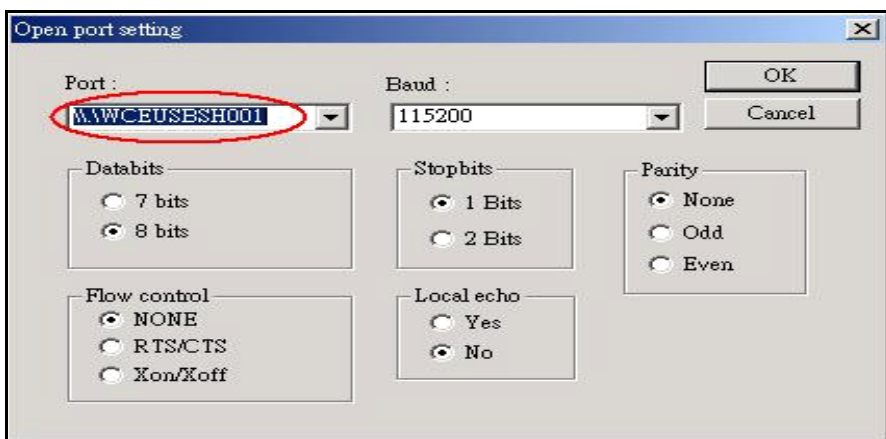


2. Set the Unit into Bootloader Mode (While Press & Hold **Power + Record + Reset**), wait for Serial on display.

Message on PDA Screen:



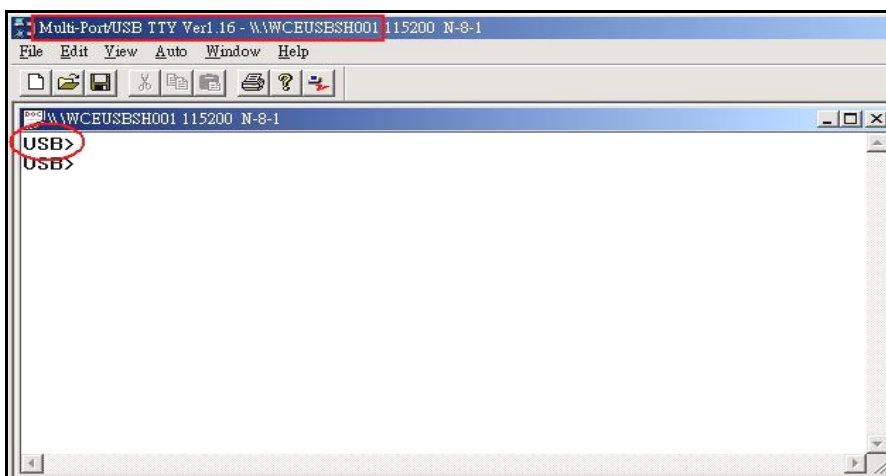
3. Connect the unit to the PC with **USB cable or USB cradle**, unit display will change to **USB**, and then open MTTY116.exe to select USB port.



4. Insert 64 MB SD or MMC card into SD slot of PDA Phone

5. On the PC side, Select **OK** and press **ENTER**.

Following display will be shown:

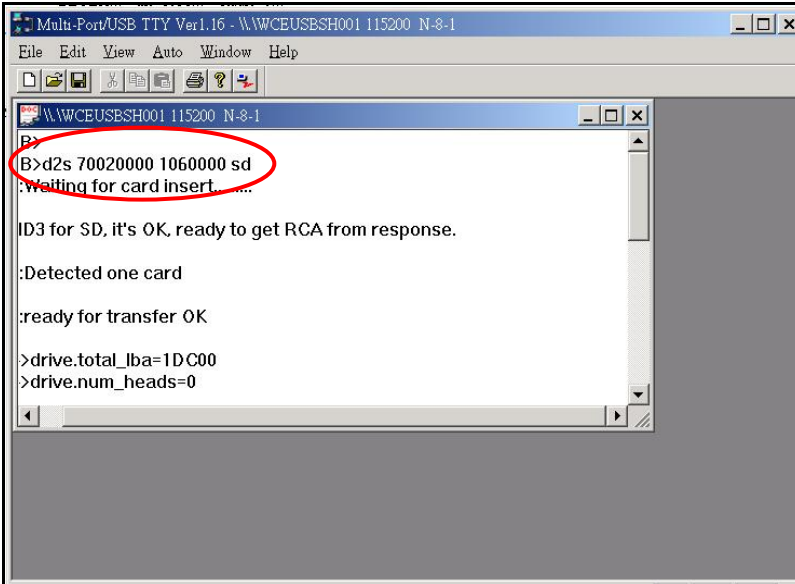


6. The prompt "USB>" will appear, to **UPLOAD M-System Image** then Type:

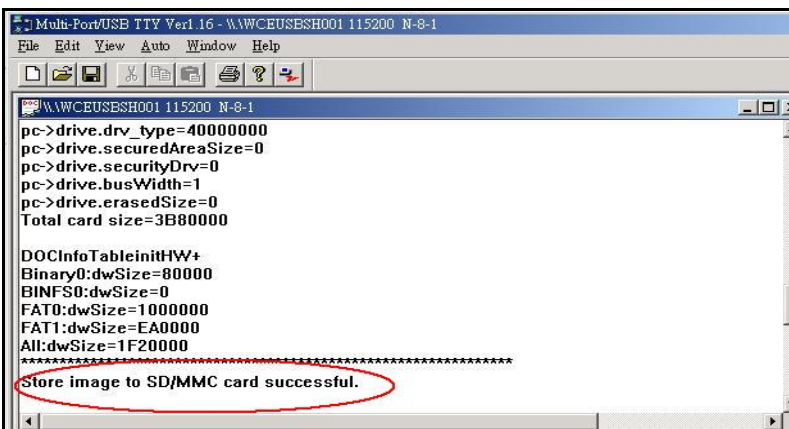
USB>d2s 70020000 1060000 sd

(Please notice the blank space between d2s and address, sd)

Then press ENTER, following display will be shown:



7. The process begins and waits for 3 to 4 minutes until it shows **the display will be shown:**



Again, on PDA phone will show message : 100% Checksum is OK.

CAUTION! DO NOT REMOVE THE USB CABLE FROM THE PC OR PDA, FAIL TO DO SO MAY CAUSE DEVICE UNIT FAIL TO BOOT.

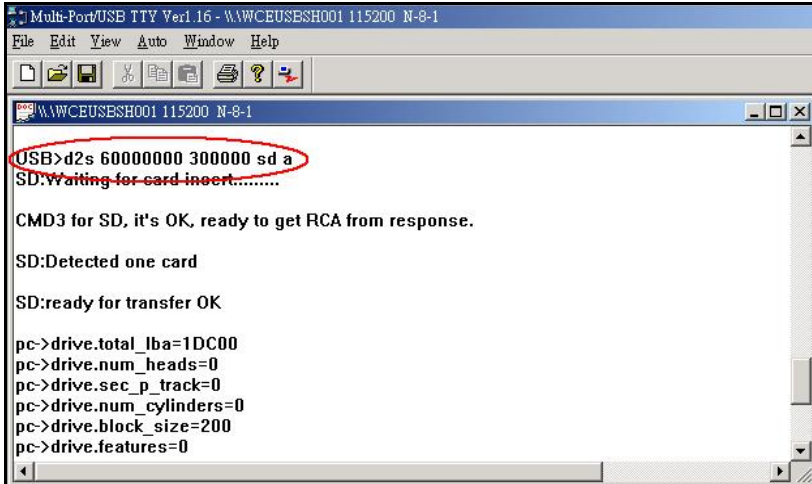
Once done, above display will be shown on PC display, while on PDA phone, a message of: 100% Checksum is OK.

Next, continue to upload **GSM ROM Image** by typing:

8. Continue with GSM image upload.

USB>d2s 60000000 300000 sd a

Then presses ENTER, and then the display will be shown:



```
Multi-Port/USB TTY Ver1.16 - \\WCEUSBSH001 115200 N-8-1
File Edit View Auto Window Help
\\WCEUSBSH001 115200 N-8-1
USB>d2s 60000000 300000 sd a
SD:Waiting for card insert.....

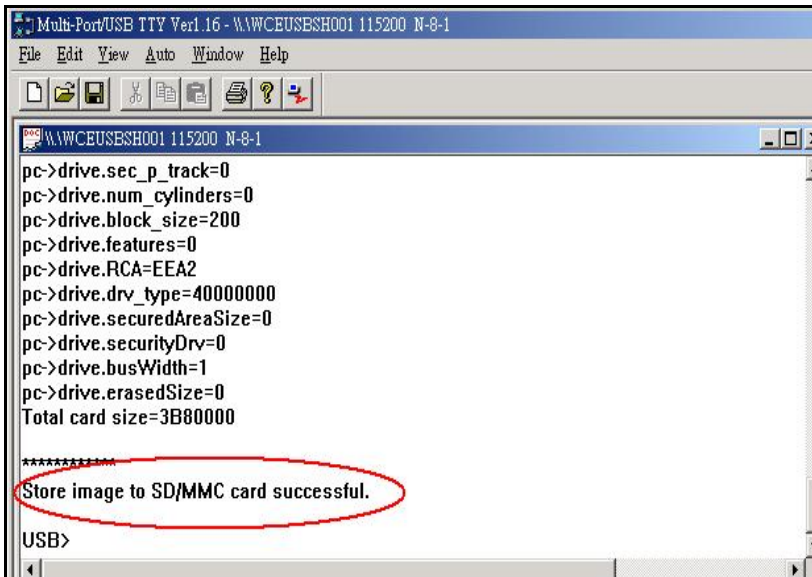
CMD3 for SD, it's OK, ready to get RCA from response.

SD:Detected one card

SD:ready for transfer OK

pc->drive.total_lba=1DC00
pc->drive.num_heads=0
pc->drive.sec_p_track=0
pc->drive.num_cylinders=0
pc->drive.block_size=200
pc->drive.features=0
```

9. The process begins and waits for 4 to 5 minutes until it shows **the display will be shown:**



```
Multi-Port/USB TTY Ver1.16 - \\WCEUSBSH001 115200 N-8-1
File Edit View Auto Window Help
\\WCEUSBSH001 115200 N-8-1
pc->drive.sec_p_track=0
pc->drive.num_cylinders=0
pc->drive.block_size=200
pc->drive.features=0
pc->drive.RCA=EEA2
pc->drive.driv_type=40000000
pc->drive.securedAreaSize=0
pc->drive.securityDrv=0
pc->drive.busWidth=1
pc->drive.erasedSize=0
Total card size=3B80000

*****
Store image to SD/MMC card successful.

USB>
```

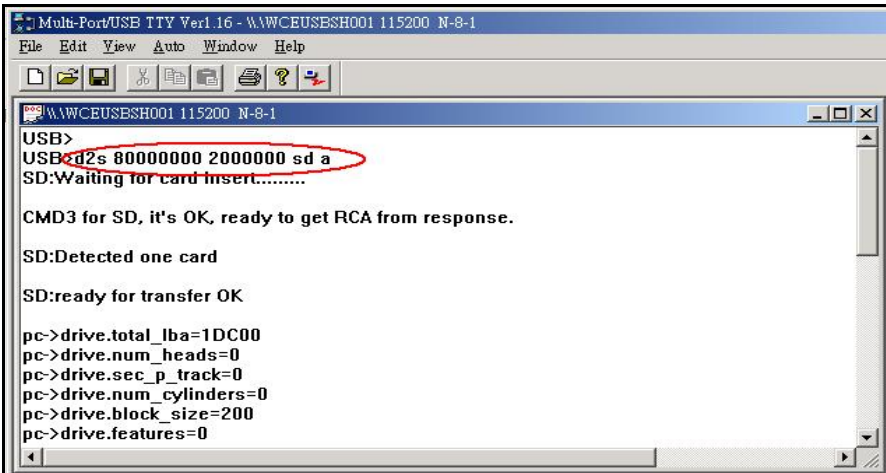
PDA Phone display will show : 100% Checksum is OK.

10. Continue with OS image upload.

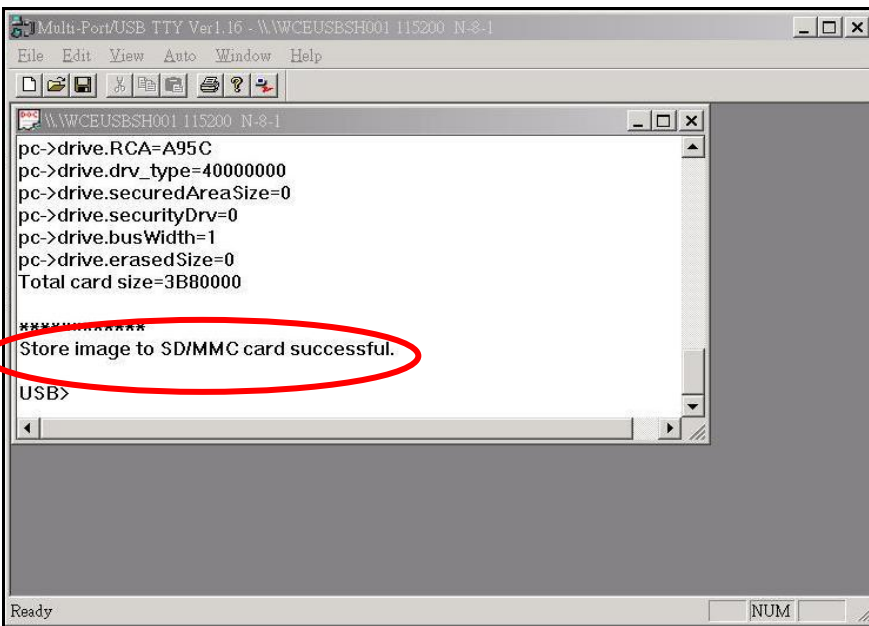
USB>d2s 80000000 2000000 sd a

(Means to upload PDA image code to SD card by typing d2s command, note there is a blank space between d2s and the address), then Press **ENTER**

The following display will be shown on PC display:



11. The process begins and waits for 3 to 4 minutes until it shows the display will be shown:



Now the upload to SD card is done!

Take out the SD card from PDA phone and mark it according to the Language you build for.

B. Use Pre-loaded SD card to Re-flash Unit.

1. Insert Pre-loaded SD card to the unit.
2. Reset the unit and enter the bootloader mode, by pressing Press & Hold **Power + Record** simultaneously and Reset the unit. Display will show....

```
SD Download
-----
Sections=3
Press Power
To Flash.....
```

3. Following the instruction on PDA phone by pressing Power to start flash.
4. Once it is Done, display will show

```
SD Download
-----
Sections=1

Please Wait
For
Downloading

XX%
Radioupdating
```



```
SD download
-----
Sections=2

Download
Completed

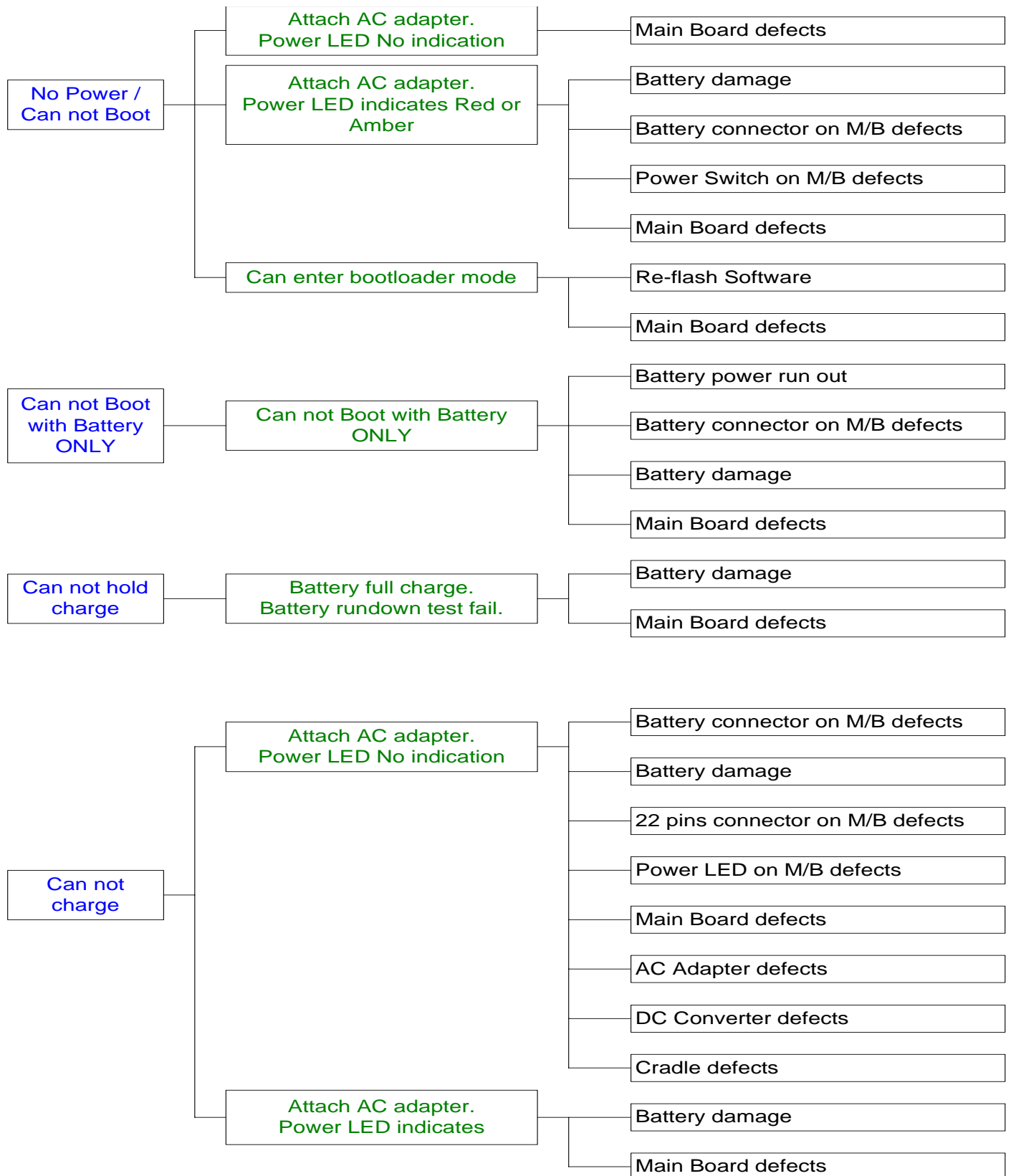
Checksum OK!
100%
```

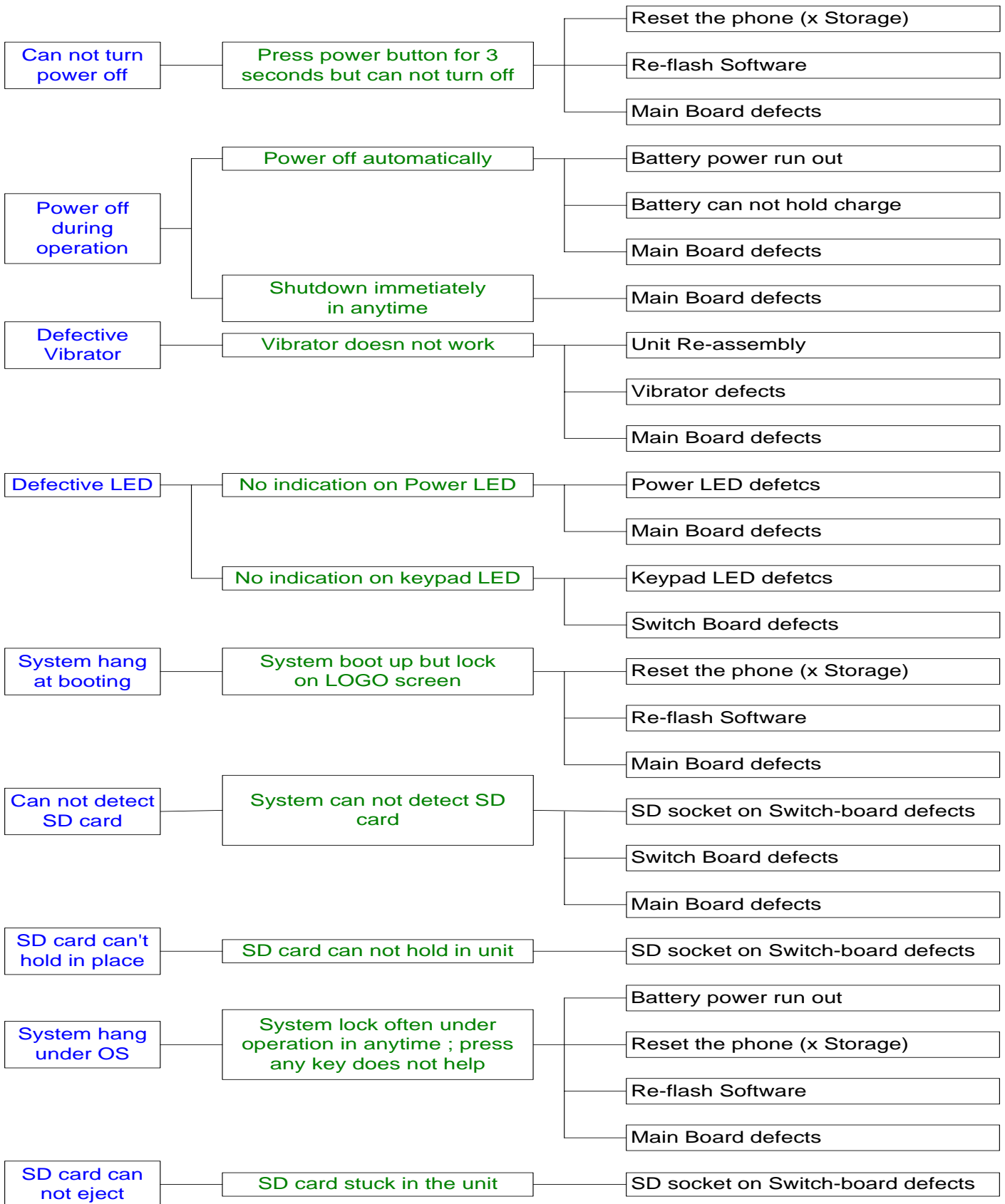
5. Take out the SD card and Cold boot the device (unit).
6. Press "Power + Reset" to cold boot the device (unit)

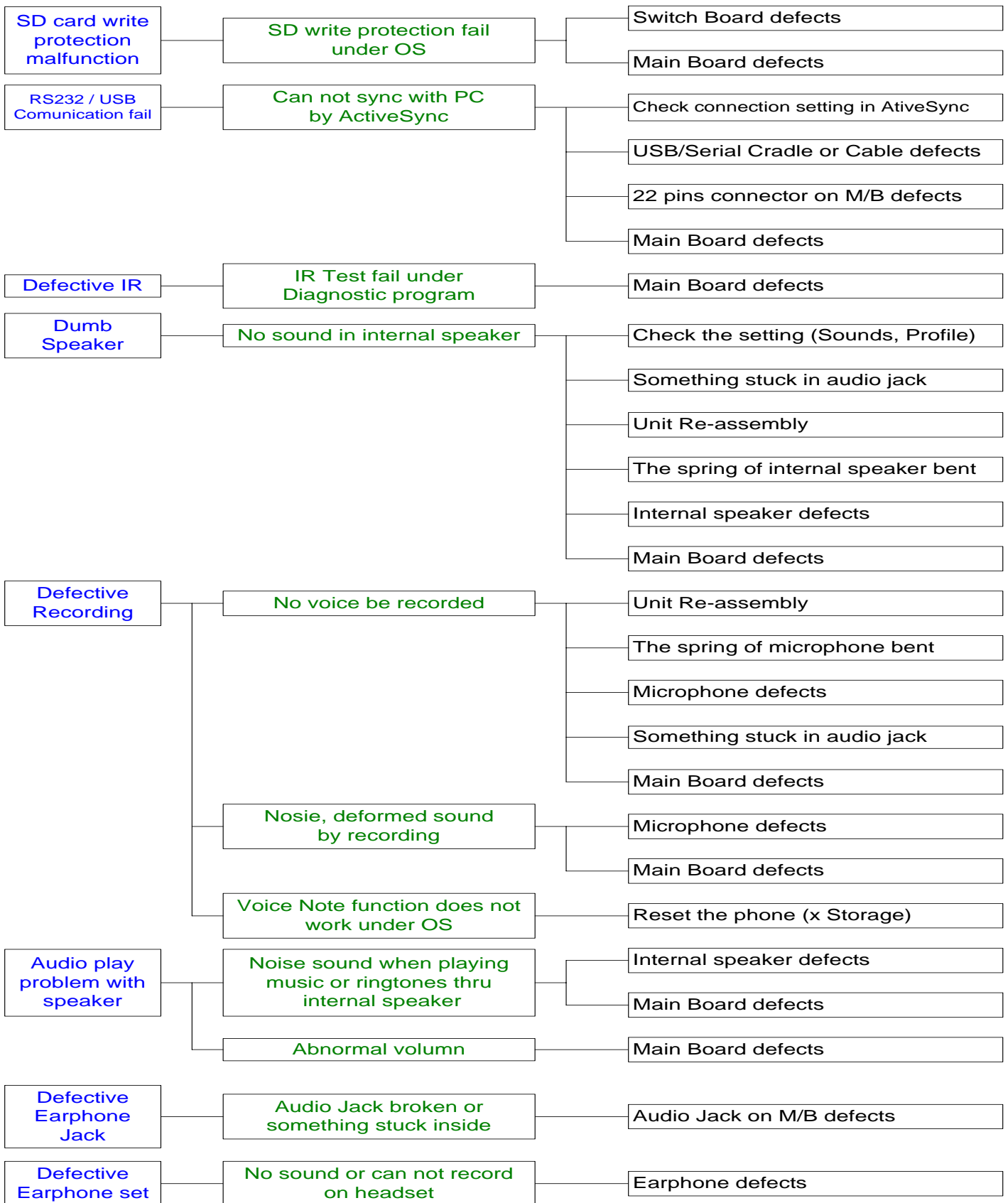
Now the upgrade is done!

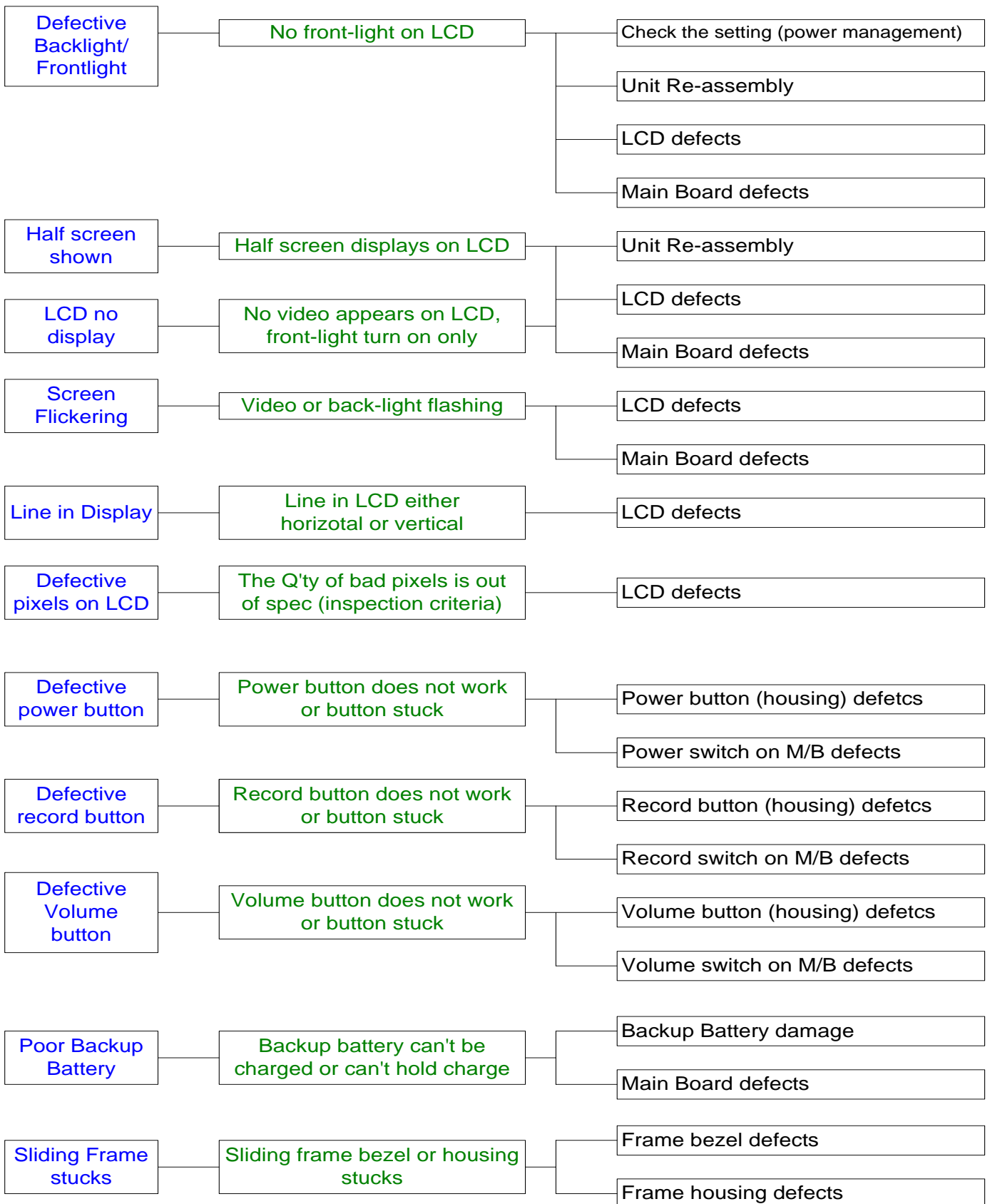
Note: Due to security issue, it is not allowed to re-flash different customer ID.

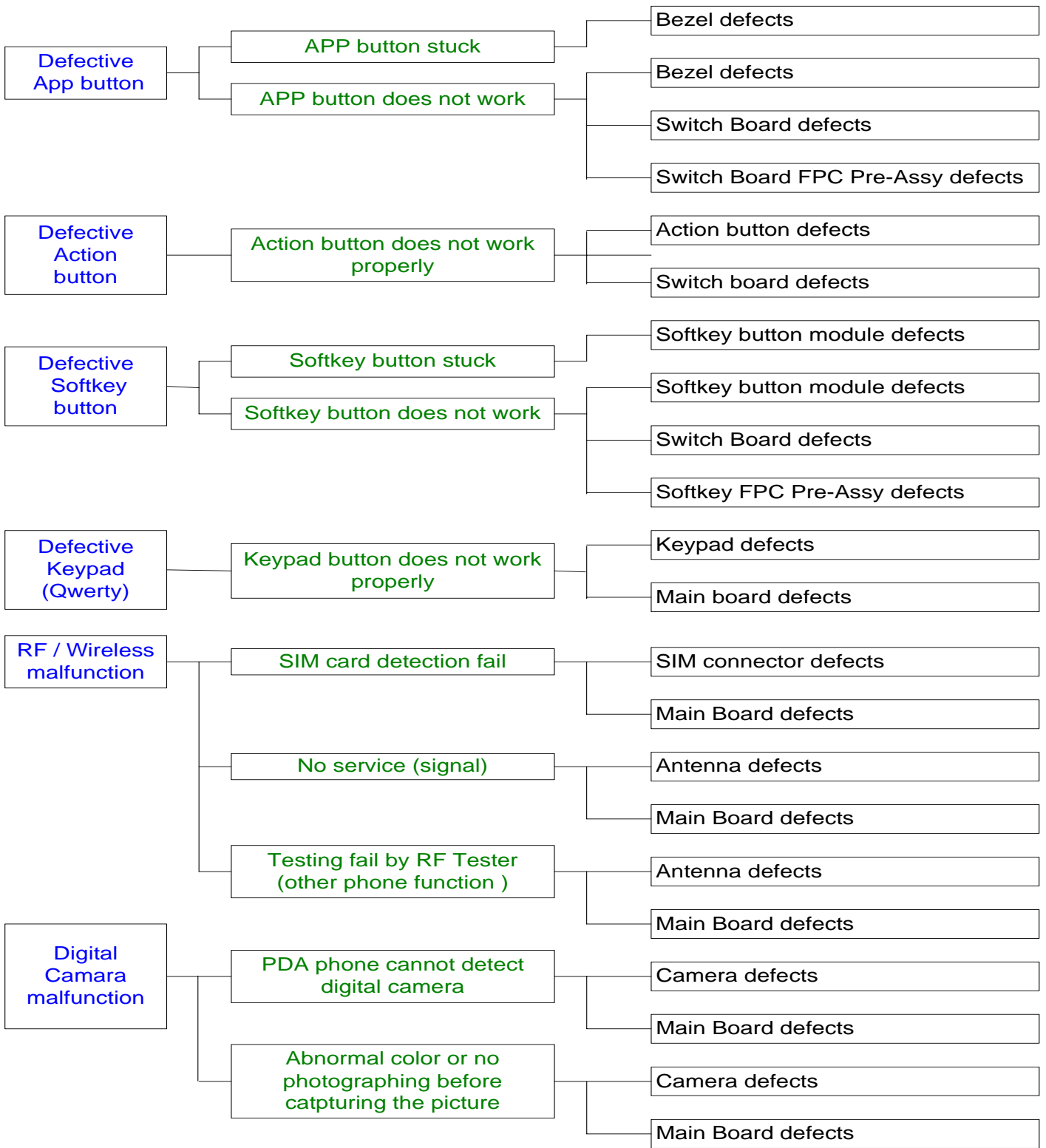
9. FTA (Faulty Tree Analysis)











10. Spare Part List

Blue Angel Part List

Item	HTC P/N	Description	Using Q'ty	Remark
1	35H00032-00	BatteryPack,US383450A7T,SONY,81*57*6.8mm,Blue	1	
2	35H00039-00M	BackupBattery,074382P,V18HRTS,VARTA,D12.5*2.	1	
3	36H00174-00	MICROPHONE,MD4530AWZ-9,EMKAY,6.3*5.25*5.95mm	1	
4	36H00175-00M	Antenna,GSM,390-OY325-F1V1P,FILTRONICKL,60*30.	1	
5	36H00176-00	Vibrator,A4B-12-WBS,C.I.K,D5.3*15.3mm	1	
6	36H00184-00M	Speaker,DTR275-004,MERRY,20*14*6.05mm,Pb-FREE,	1	
7	51H00209-00	PCBASSY, SwitchBoard,BlueAngels	1	
8	51H00215-00	PCB Assy, Main Board,Blue angels	1	
9	54H00079-00	Camera, ADCM-2650-6501,31.5*10.5*8.2mm,Agilent,	1	
10	60H00018-00	LCM, ACX502BMV,SONY,91.1*64.3*4.65mm	4	
11	71H00659-00	Softkey,Bezel,47.5*5.2*2.1mm,Plastic□ ,BI	1	
12	71H00660-00	NavigationKey,Bezel,56.6*15.8*4.7mm,Plastic	1	Generic
13	71H00680-00M	Spacer,Right,Frame,Bezel,POM,Pb-FREE,BlueAngel	1	
14	71H00681-00M	Spacer,Left,Frame,Bezel,POM,Pb-FREE,BlueAngels	1	
15	71H00890-00M	SD FILLER,32.2*24*2mm,¼¼ü	1	
16	72H00441-00M	SCREW,TORX,FLAT,M1.6X4.5mm,BLACK,Pb-FREE	3	
17	72H00442-00M	SCREW,TORX,FLAT,M1.6X2.5mm,BLACK,Pb-FREE	4	
18	72H00459-00	SCREW_KH-B1.2X3BZ,AISI-1018	8	
19	72H00480-00M	Cover,BackupBattery,D12.75*2.25mm,NickelSilv	1	
20	72H00528-00M	Screw,PH,FLAT,NICKEL,M1.6x4L,Pb-FREE	6	
21	72H00529-00M	Gasket,Camera,5*3*0.5mm,Pb-FREE,BlueAngels	1	
22	72H00539-00M	Gasket,TGT-7*0.5*40,40*7*0.5mm,Pb-FREE,Harrier	1	
23	72H00600-00M	CopperFoil,8837H,32*30mm,Pb-FREE	1	
24	72H00642-00M	SCREW,M1.6*3,Flat-sinkheadwithTorxrecess,H	3	
25	72H00715-00M	Gasket, 25*10*0.25mm.773GT,Cateron Blue Angel	1	
26	72H00716-00M	CopperFoil,80013,25*20mm,Cateron Blue Angel	1	
27	72H00717-00M	CopperFoil,80013,36*60mm,Cateron Blue Angel	1	
28	73H00105-00	FPC assy,SoftkeyFPC, Blue Angel	1	
29	73H20009-00M	FPC Pre-Assy,Career,F0709-582,SWBoard,BlueAng	1	

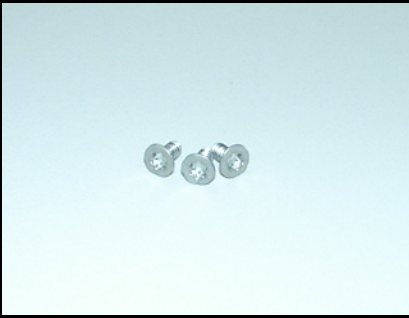


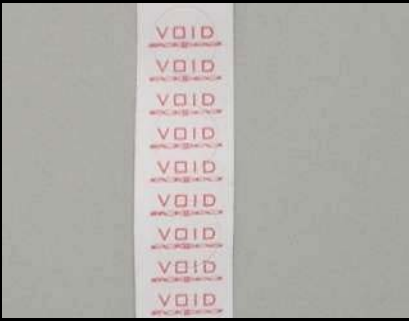





Item	HTC P/N	Description	Using Q'ty	Remark
30	74H00241-00M	Bezel,Pre-Assy,124.5*71.5*7.2mm,Pb-FREE,BlueAn	1	Generic
31	74H00242-00M	Frame,Housing,Pre-Assy,125.4*71.8*10.5mm,Pb-FR	1	Generic
32	74H00243-00M	Holder,Camera,Pre-Assy,Pb-FREE,BlueAngels,27*2	1	
33	74H00244-02M	Frame Pre-Assy,Bezel with Gasket, Blue Angels	1	Generic
34	74H00246-00M	Housing,Pre-Assy,124.87*71.3*13.15mm,Pb-FREE,B	1	Generic
35	74H00245-00	Stylus,2*2*101.2,BlueAngels	1	
36	74H00269-00M	Key-Pad,Pre-Assy,64.5*42.2*1.5mm,Pb-FREE,BlueA	1	Generic
37	76H00461-00	Rubber,AntennaCon,3.1*3.1*5.8mm,BlueAngels	1	
38	77H00083-00	SECURITYLABEL,HIMALAYAS	1	
39	77H00146-00	REGULATIONLABEL,MAINUNIT,Blue Angels	1	
40	36H00202-00M	Headset,Stereo,TS168-03206N-VM-03,eAcetech,Harrier	1	
41	70H00054-00	Pouch,Horizontal Type,Harrier	1	
42	73H00099-10	USB CABLE,CRADLE INSIDE L=120mm,0û ç «,HIMALAYAS	1	
43	75H00333-03	CONNECTOR,22P,CONN/DC JACK ADAPTER,HARRIER	1	
44	79H00032-01	AC adapter,5V 2A,PSC11A-050(H),US,Phihong,Harrier	1	
45	54H00116-00	Module Assy,Camera,LT7660FJL-HT-054r,LITEON	1	
46	60H00033-00	LCD Module,TD035STEC1,Toppoly	1	
47	60H00038-00	LCD Module,TD035STED1,TOPPOLY	1	
48	51H00278-01	PCBA-MAIN BOARD,TOPPOLY, Gemini	1	
49	51H00278-02	PCBA-MAIN BOARD,Toppoly LCD for 312,W/Camera,Gemini	1	


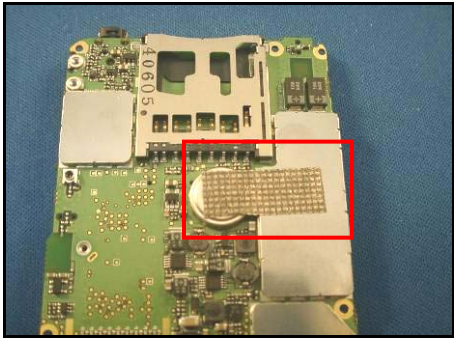
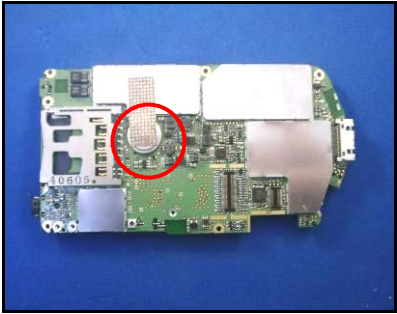
11. Spare Part Photo

		
<p>1. Generic Bezel (74H00241-00M) *Different P/N by customer.</p>	<p>2. Housing (74H00246-00M)</p>	<p>4. LCM (SONY:60H00018-00) (Toppoly: 60H00033/38-00)</p>
		
<p>4. Speaker (36H00184-00M)</p>	<p>5. Microphone (36H00174-00)</p>	<p>6. Main Board (SONY: 51H00215-00) (Toppoly: 51H00278-01/02)</p>
		
<p>7. Battery Pack (35H00032-00)</p>	<p>8. Backup Battery (35H00039-00M)</p>	<p>9. Navigation Button (71H00660-00)</p>

		
<p>10.Softkey Button (71H00659-00)</p>	<p>11.Stylus (74H00245-00)</p>	<p>12.Vibrator (36H00176-00)</p>
		
<p>13.Camera (Different by customer) (Agilent: 54H00079-00) (LITEON: 54H00116-00)</p>	<p>14.Bezel Frame (74H00244-00M)</p>	<p>15.Housing Frame (74H00242-00M)</p>
		
<p>16.Antenna (36H00175-00)</p>	<p>17.SD Card Filler (71H00890-00M)</p>	<p>18.Keypad (74H00269-00M)</p>

		
<p>19.Softkey FPC-Assy. (73H00105-00)</p>	<p>20. Switch Board FPC-Assy. (73H20009-00M)</p>	<p>21.Switch Board (51H00209-00)</p>
		
<p>22. Spacer for Bezel frame (Right: 71H00680-00M) (Left: 71H00681-00M)</p>	<p>23.Camera Holder (74H00243-00M)</p>	<p>24.Antenna Rubber (76H00461-00)</p>
		
<p>27.Gasket on LCM (72H00539-00M)</p>	<p>26.Gasket between Camera & MB (72H00529-00M)</p>	<p>27.Screw (Bezel ~ LCM) X 8 (72H00459-00)</p>

		
<p>28.Screw (2 for surrounding of the unit,1 for Housing) (72H00642-00M)</p>	<p>29.Copper Foil for LCM (72H00600-00M)</p>	<p>30.Screw (Main Board) X 6 (72H00528-00M)</p>
		
<p>31.Security Label (77H00083-00)</p>	<p>32.Screw (Bezel ~ Frame) X 4 (72H00442-00M)</p>	<p>33.Screw (Housing) X 3 (72H00441-00M)</p>
		
<p>34.Regulatory Label (77H00146-00)</p>	<p>35.Copper Foil on Frame Housing (72H00716-00M)</p>	<p>36.Copper Foil on LCM (72H00717-00M)</p>

		
<p>37. Gasket on Frame Bezel (72H00714-00M)</p>	<p>38. Gasket on MB (72H00715-00M)</p>	<p>39. Backup Battery Cover (72H00480-00M)</p>

Appendix

A. Customer, Retailer Misjudgment

Before attempt repairing the unit, make sure the type of reported failure could be clearly reproduced; otherwise, check with the customer or distributor once again to identify the problem correctly.

The following are failure symptoms that are typical by misjudgment

No.	Item	Possibility
1	No Power even the power button is pressed	Main Battery low power exhausted.
		While Back Light is turned OFF, the surrounding lighting will be reflected on the panel and in a dim location, it looks like the unit is turned OFF.
		According to the Power Management settings, the units will be switched OFF automatically.
2	Battery discharges quickly	The battery life depends on the devices being used in SD Card Slot, and frequency of use of the Backlight. These functions consume a lot of energy.
		Operating with front light ON, or using high-energy consumption devices such as SD Memory Card will drain out the battery pack faster.
3	Battery cannot be charged	Using AC adapter that is NOT supplied with the unit.
		Charging the battery while operating the unit with heavy loadings could cause the temperature inside the unit to build up which could cause the unit stop charging. At this moment, the LED indicator will flash Yellow to notify user that the charging has been stopped. Or the temperature is extremely low will also stop charging. Since the extreme high or low temperature will cause the battery to discharge quickly, it has been designed to cut battery charge below 0°C and above 35~40°C to protect the battery pack.
4	Cannot make communications via mobile phones through exclusive cable.	If the unit could pass the test with Loop back Interface card, the possibility of unit malfunction becomes low. Then the following items could be the reason of problem such as location, timing, signal strength, service provider's mixed up, or problem with the mobile itself. Or could be incompatibility issue.
5	Cannot use SD/CF Memory Card	Card is not being pre-formatted.
		SD card has been switched to Write Protect mode.
		Card not inserted completely, or bad contact between connector contacts.
6	Black or White dot on the screen.	For LCD panel's normal behavior, it is hard to find a panel without any bad pixel. Once the numbers of dots and the distance between them are within the specifications, it is allowed.
7	Touch Screen or Program Buttons are not reacting.	Could be wrong operation.
		Screen not properly aligned with the stylus calibration.

8	Front Light dim, cannot turn ON, or shuts OFF automatically.	Check the Front Light settings in Power Management settings
9	Cannot playback music, No sound or volume is low.	When Battery low, the music playback becomes difficult and the volume could become lower.
10	Cannot execute installed application programs	Could be an incompatible software
11	Operation is slow in response	Could be insufficient memory. Check amount of system memory.
12	Hang up	Software being used sometimes is not fully compatible with the system.
		Execute many application programs simultaneously
		Software that requires big amount of memory spaces or the system memory is low or the files being used is fragmented.
13	System Memory is enough, but is shows insufficient.	Software that requires big amount of memory spaces or the system memory is low or the files being used is fragmented.

***Note: Nevertheless, the above symptoms could be solved by a warm boot or cold boot, make sure the warm/cold boot has been executed and try to reproduce the symptom reported.**

How to perform Warm Boot and Cold Boot:

Warm Boot: Reset the unit by pressing reset button.

Cold Boot: Press Power ++ Reset the unit simultaneously.

B. Labeling Plan (Generic)

B.1 Main unit Regulatory label (on the rear housing of main unit)

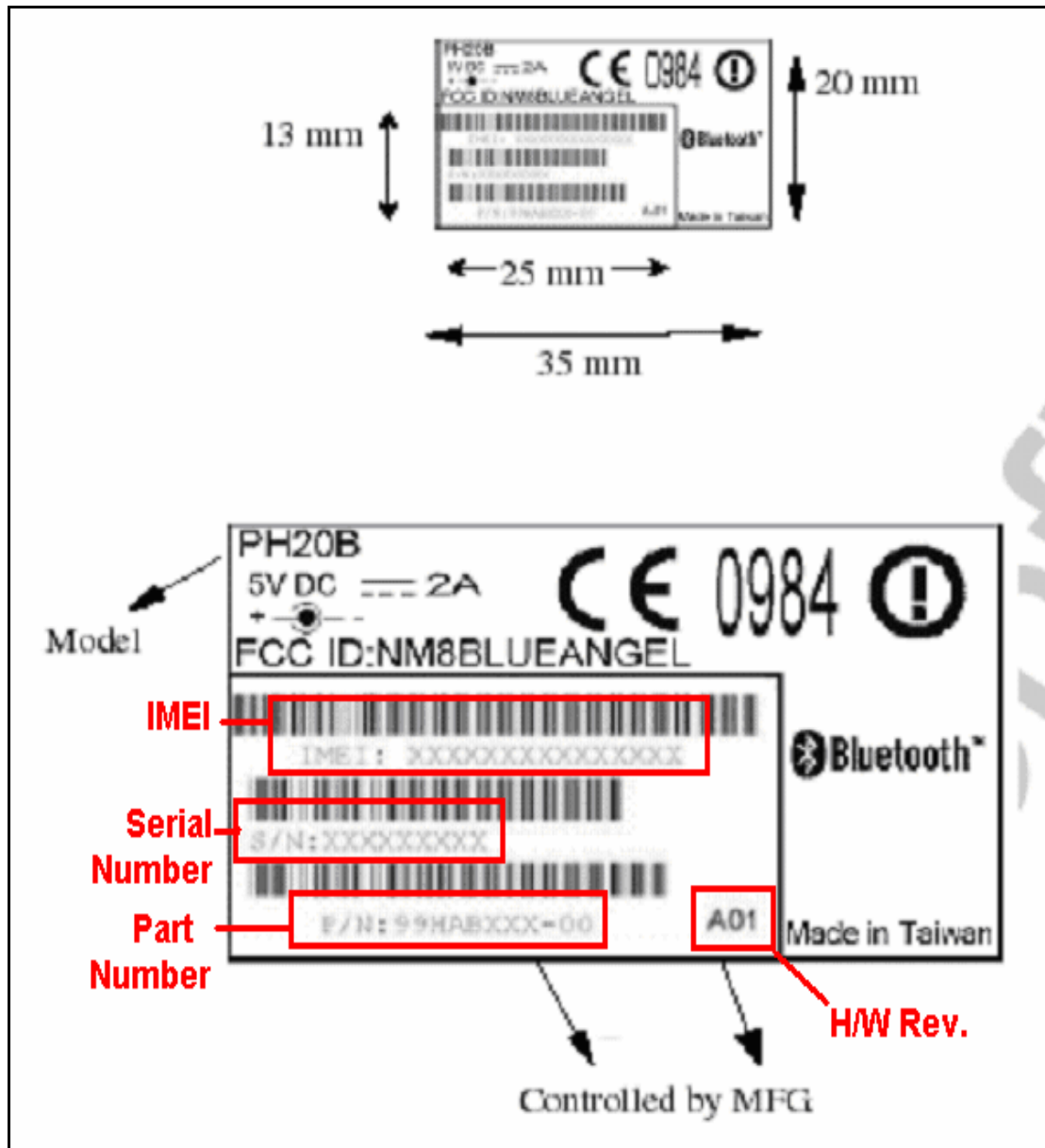
It includes:

- ◆ Unit IMEI & Barcode
- ◆ Unit Serial Number & Barcode
- ◆ Unit Part Number & Barcode

Image file name: MAIN_UNIT_REGULATION

Please note: 1. The brand name is shown on Bezel.

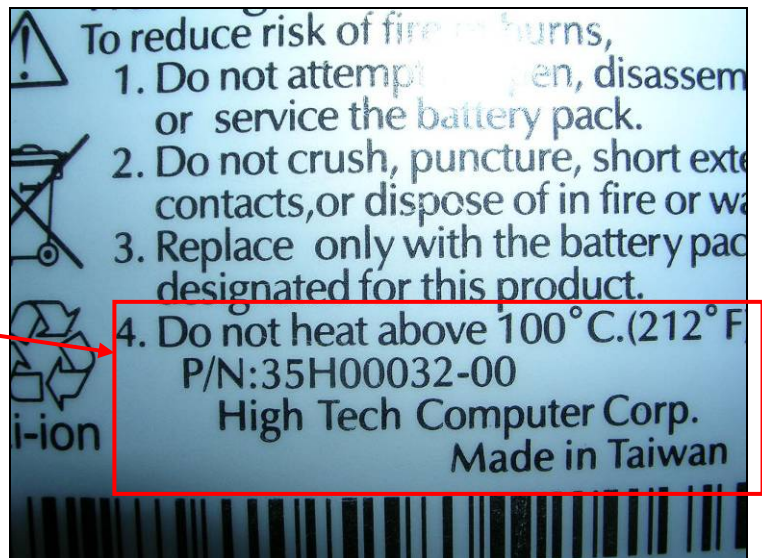
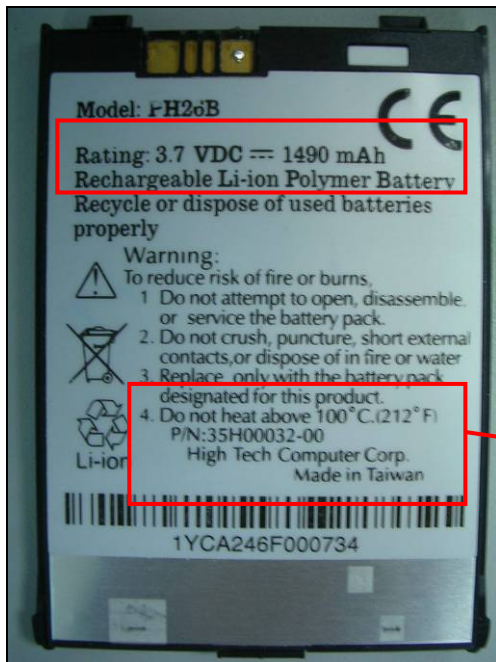
2. All bar codes must be code 128 symbology.



B.2 Main Battery Label

For main battery defect return cause end-user claim from field, highlight battery label draft detail for identification.

- ◆ Battery Capacity: 1490mAh.
- ◆ Part number: 35H00032-00
- ◆ Manufacturer: High Tech Computer Corp.
- ◆ Place of origin: Made in Taiwan.



B.3 Definition of Serial Number

For S/N: **SSYWWPPZZZZZ**

SS: SITE CODE→ HT

Y: Year Last Digital of the Year.

WW: Week Code: 01 ~ 54

PP: Product Code: D6

ZZZZZ: Serial Number (00001 ~ 99999) Use Base 10

For MODEL: PH20B is for label vendor's ID.

Label Characteristic:

Material: polyester

Color: pantone 422c

Ink: pantone 425c

HTC confidential

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TOTAL 71 CONT.ON. 64 PAGE NO. 63

C. RF Antenna Test Specification

GSM 900 & 1800

Items	Test Name	TxLevel	TCH	1st Downlink CellPower	Spec	Note
1	Camp @DCS Band	0	512	-75		BCH=600
2	BS Originate call	0	512	-75		
E-GSM 900 Transmitter Test						
3	Check TX Power	5	975	-104dBm	33±2dBm	
4	TX Phase RMS Error	5	975	-104dBm	≤ 5°	
5	TX Phase Peak Error	5	975	-104dBm	≤ 20°	
6	TX Frequency Error	5	975	-104dBm	≤ 0.1ppm	
7	Fast Bit Error Rate	5	975	-104dBm	≤ 2%	Receiver Test
8	Check TX Power	5	124	-104dBm	33±2dBm	
9	TX Phase RMS Error	5	124	-104dBm	≤ 5°	
10	TX Phase Peak Error	5	124	-104dBm	≤ 20°	
11	TX Frequency Error	5	124	-104dBm	≤ 0.1ppm	
12	Fast Bit Error Rate	5	124	-104dBm	≤ 2%	Receiver Test
13	Check TX Power	5	1	-104dBm	33±2dBm	
14	TX Phase RMS Error	5	1	-104dBm	≤ 5°	
15	TX Phase Peak Error	5	1	-104dBm	≤ 20°	
16	TX Frequency Error	5	1	-104dBm	≤ 0.1ppm	
17	Fast Bit Error Rate	5	1	-104dBm	≤ 2%	Receiver Test
DCS 1800 Transmitter Test						
1	Check TX Power	0	512	-104dBm	30±2dBm	
2	TX Phase RMS Error	0	512	-104dBm	≤ 5°	
3	TX Phase Peak Error	0	512	-104dBm	≤ 20°	
4	TX Frequency Error	0	512	-104dBm	≤ 0.1ppm	
5	Fast Bit Error Rate	0	512	-104dBm	≤ 2%	Receiver Test
6	Check TX Power	0	700	-104dBm	30±2dBm	
7	TX Phase RMS Error	0	700	-104dBm	≤ 5°	
8	TX Phase Peak Error	0	700	-104dBm	≤ 20°	
9	TX Frequency Error	0	700	-104dBm	≤ 0.1ppm	
10	Fast Bit Error Rate	0	700	-104dBm	≤ 2%	Receiver Test
11	Check TX Power	0	885	-104dBm	30±2dBm	
12	TX Phase RMS Error	0	885	-104dBm	≤ 5°	
13	TX Phase Peak Error	0	885	-104dBm	≤ 20°	
14	TX Frequency Error	0	885	-104dBm	≤ 0.1ppm	
15	Fast Bit Error Rate	0	885	-104dBm	≤ 2%	Receiver Test

GSM 1900 & 850

PCS 1900 Transmitter Test						
1	Check TX Power	0	512	-104dBm	30±2dBm	
2	TX Phase RMS Error	0	512	-104dBm	≤ 5°	
3	TX Phase Peak Error	0	512	-104dBm	≤ 20°	
4	TX Frequency Error	0	512	-104dBm	≤ 0.1ppm	
5	Fast Bit Error Rate	0	512	-104dBm	≤ 2%	Receiver Test
6	Check TX Power	0	660	-104dBm	30±2dBm	
7	TX Phase RMS Error	0	660	-104dBm	≤ 5°	
8	TX Phase Peak Error	0	660	-104dBm	≤ 20°	
9	TX Frequency Error	0	660	-104dBm	≤ 0.1ppm	
10	Fast Bit Error Rate	0	660	-104dBm	≤ 2%	Receiver Test
11	Check TX Power	0	810	-104dBm	30±2dBm	
12	TX Phase RMS Error	0	810	-104dBm	≤ 5°	
13	TX Phase Peak Error	0	810	-104dBm	≤ 20°	
14	TX Frequency Error	0	810	-104dBm	≤ 0.1ppm	
15	Fast Bit Error Rate	0	810	-104dBm	≤ 2%	Receiver Test
GSM 850 Transmitter Test						
1	Check TX Power	7	128	-104dBm	29±2dBm	
2	TX Phase RMS Error	7	128	-104dBm	≤ 5°	
3	TX Phase Peak Error	7	128	-104dBm	≤ 20°	
4	TX Frequency Error	7	128	-104dBm	≤ 0.1ppm	
5	Fast Bit Error Rate	7	128	-104dBm	≤ 2%	Receiver Test
6	Check TX Power	7	189	-104dBm	29±2dBm	
7	TX Phase RMS Error	7	189	-104dBm	≤ 5°	
8	TX Phase Peak Error	7	189	-104dBm	≤ 20°	
9	TX Frequency Error	7	189	-104dBm	≤ 0.1ppm	
10	Fast Bit Error Rate	7	189	-104dBm	≤ 2%	Receiver Test
11	Check TX Power	7	251	-104dBm	29±2dBm	
12	TX Phase RMS Error	7	251	-104dBm	≤ 5°	
13	TX Phase Peak Error	7	251	-104dBm	≤ 20°	
14	TX Frequency Error	7	251	-104dBm	≤ 0.1ppm	
15	Fast Bit Error Rate	7	251	-104dBm	≤ 2%	Receiver Test

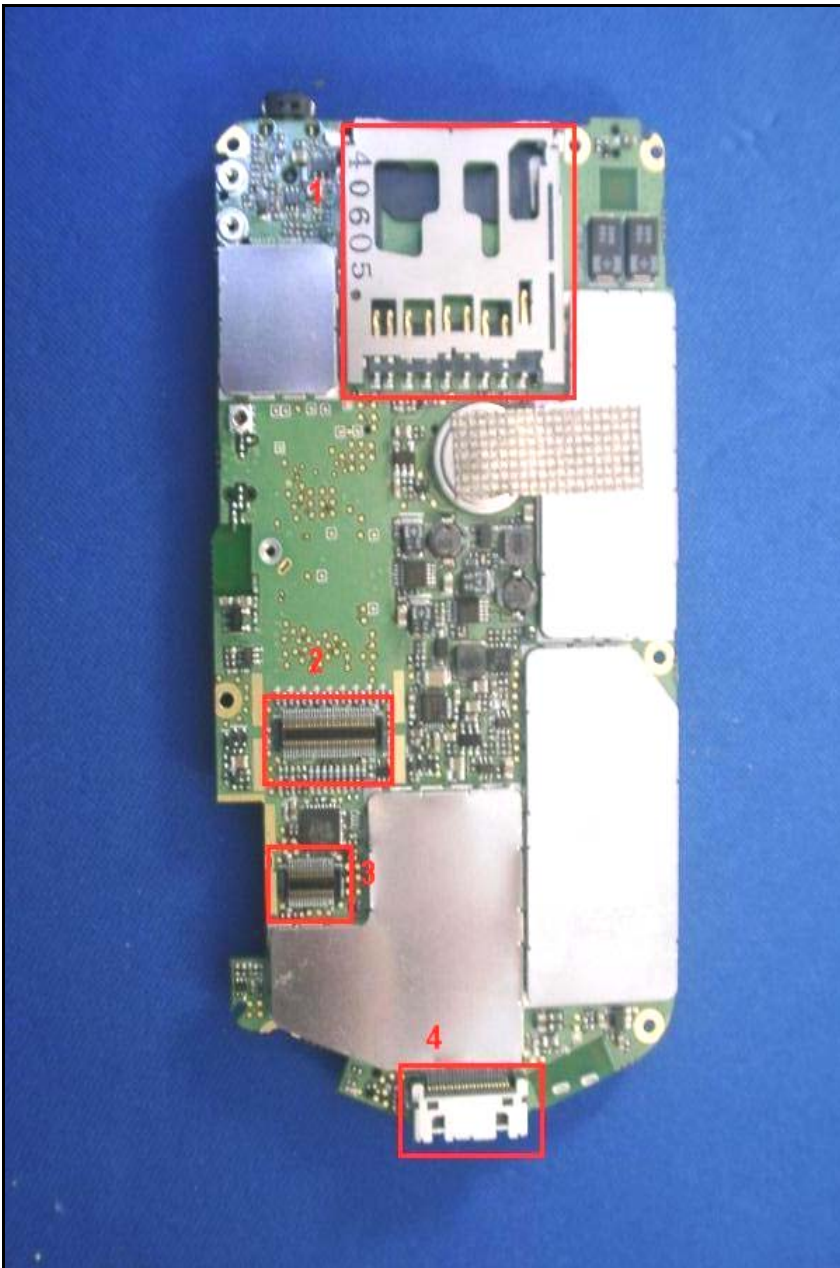
D. Board Level 2.5 Repairs

A. Components to be replaced

I. Main Board: ONLY the following items have been allowed to replace for M/B.

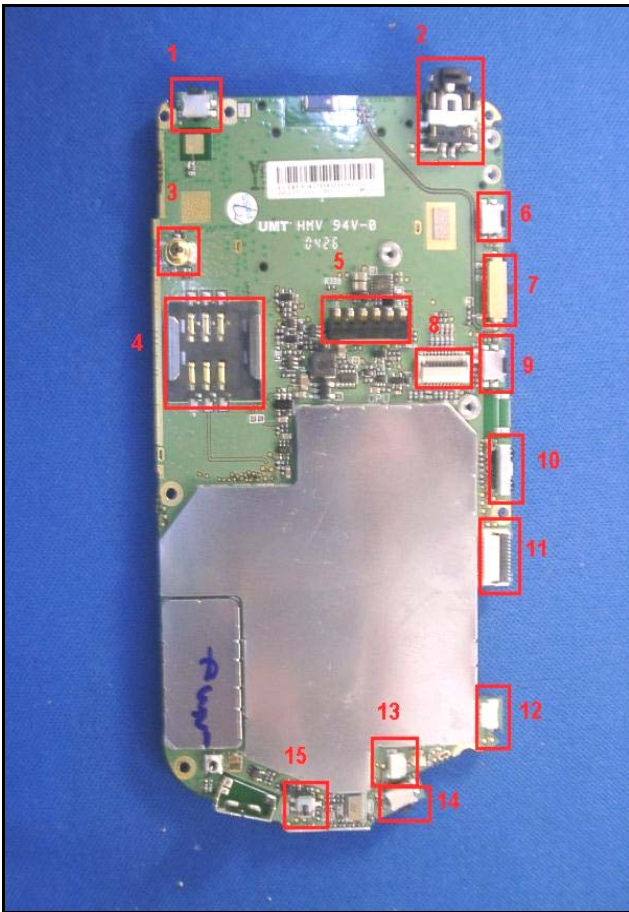
Obverse side

1. SD Card Slot (CON705)
2. LCD FPC Connector (CON702)
3. Switch Board FPC Connector (CON700)
4. USB Port Connector (CON704)



Reverse side

1. Power Switch (SW705)
2. Audio Jack (CON601)
3. Antenna Switch (SW1)
4. SIM Card Connector (U505)
1. Battery Connector (CON301)
6. Recording Switch (SW702)
7. Volume Switch (SW701)
8. Camera FPC Connector (CON701)
9. Camera Switch (SW703)
10. IR Sensor (U716)
11. Keypad FPC Connector (CON708)
12. Vibrator Connector (CON706)
13. Microphone Connector (CON600)
14. Reset Switch (SW704)
15. Battery Detector Switch (SW700)



E. Problem Identification & Troubleshooting

I. Basic Repair Instructions for Component Replacement:

Step 1 Place the solder-proof tape to cover the surrounding area of the components which being replaced.

Warning : *DO NOT overheat the tape and components to avoid the tape melted and make the component damage.*

Step 2 Use Heater Gun (HAKO850B, set the temperature between 350°C, Air Speed 3~5) to remove the components.

Step 3 It has to wait the temperature cool down before the damaged components been removed. Or, the others components could be gone when the solder-proof tape been taken off.

Step 4 After the damaged components has been replaced; clean the surroundings for solder and flux residues.

II. Main Board: The following items have been allowed to replace for Main Board

1. Recording Switch (SW702), Camera Switch (SW703), Reset Switch (SW704), Power Switch (SW705)

1.1 If the switch is broken, warp or doesn't work properly (measure by scope), replace it.

1.2 If the switch still doesn't work properly after replace new one, please replace the M/B.

2. Camera FPC Connector (CON701), Keypad FPC Connector (CON708)

2.1 If the connector is broken, warp or doesn't work properly (measure by scope), replace it.

2.2 If the connector still doesn't work properly after replace new one, please replace the M/B.

2.3 Place solder-proof tape on CON701 or CON708 to prevent it melted when using heater gun to remove CON701 or CON708.

3. Backup Battery Connector (CON303), Microphone Connector (CON600), Vibrator Connector (CON706)

3.1 If the connector is broken, warp or doesn't work properly (measure by scope), replace it.

3.2 If the connector still doesn't work properly after replace new one, please replace the M/B.

4. Synchronization Port Connector (CON704)

4.1 If the connector is broken, warp or doesn't work properly (measure by scope), replace it.

4.2 If the connector still doesn't work properly after replace new one, please replace the M/B.

5. Audio Jack (CON601)

- 5.1 If the connector is broken, warp or doesn't work properly (measure by scope), replace it.
- 5.2 If the connector still doesn't work properly after replace new one, please replace the M/B.

6. LCD FPC Connector (CON702)

- 6.1 If the connector is broken, warp or doesn't work properly (measure by scope), replace it.
- 6.2 If the connector still doesn't work properly after replace new one, please replace the M/B.

6.3 Place solder-proof tape on CON702 to prevent it melted when using heater gun to remove CON702.

7. Switch Board FPC Connector (CON700)

- 7.1 If the connector is broken, warp or doesn't work properly (measure by scope), replace it.
- 7.2 If the connector still doesn't work properly after replace new one, please replace the M/B.

7.3 Place solder-proof tape on CON700 to prevent it melted when using heater gun to remove CON700.

8. Battery Connector (CON301)

- 8.1 If the connector is broken, warp or doesn't work properly (measure by scope), replace it.
- 8.2 If the connector still doesn't work properly after replace new one, please replace the M/B.

9. SIM Card Connector (U505)

- 9.1 If the connector is broken, warp or doesn't work properly (measure by scope), replace it.
- 9.2 If the connector still doesn't work properly after replace new one, please replace the M/B.

9.3 Use solder iron only to replace new component. DO NOT use Heater Gun to remove component to prevent next connector melted.

10. Antenna Switch (SW1)

- 10.1 If the switch is broken, warp or doesn't work properly (measure by scope), replace it.
- 10.2 If the switch still doesn't work properly after replace new one, please replace the M/B.

11. Battery Detector Switch (SW700)

- 11.1 If the switch is broken, warp or doesn't work properly (measure by scope), replace it.
- 11.2 If the switch still doesn't work properly after replace new one, please replace the M/B.

12. Volume Control Switch (SW701)

- 12.1 If the switch is broken, warp or doesn't work properly (measure by scope), replace it.
- 12.2 If the switch still doesn't work properly after replace new one, please replace the M/B.

13. SD Card Slot (CON705)

- 13.1 If the slot is broken, warp or doesn't work properly (measure by scope), replace it.
- 13.2 If the slot still doesn't work properly after replace new one, please replace the M/B.

14. IR Sensor (U716)

- 14.1 If the slot is broken, warp or doesn't work properly (measure by scope), replace it.
- 14.2 If the slot still doesn't work properly after replace new one, please replace the M/B.

F. Blue Angel Spare Part List For Board Level Repair

Blue Angel BOARD LEVEL Spare part List

Item	Description	Number	Qty	Location	Substitute
1	IR,HSDL-3201,AGILENT	29H40011-00M	1	U716	29H40011-00
2	SWITCH BUTTON,PTS-106,HCH,4.7*4.5*1.65,70/-20degC,BLUE ANGELS	36H00129-00M	4	SW702 SW703 SW704 SW705	36H00298-00M 36H00298-00M
3	BATTERY DETECTOR,PDS101C-E,HCH,3.8*5*2.8,75degC,-25degC	36H00138-00	1	SW700	
4	Slide_Switch,HSS112,HCH	36H00160-00M	1	SW701	
5	Audio Jack,XW6D-0801-KTD,OMRON	36H00195-00	1	CON601	
6	Ring,Backup Battery,D12.35*1.9mm,COPPER,Plating Sn,Pb-FREE,BlueAngels	72H00479-00M	1	CON303	
7	Connector FPC,FH18-21S-0.3SHW-	75H00197-01M	2	CON701 CON708	
8	CONNECTOR,SM02B-SURS-TF,JST	75H00228-00	2	CON600 CON706	
9	Connector SD Card,HONDA,SD-DR9LFYGD1	75H00240-01	1	CON705	
10	Connector Device(Battery),AXB79300602,6Pin,2.5Pitch,MATSUSHITA	75H00279-00M	1	CON301	75H00279-00
11	Connector B to B,30P,0.4Pitch,24-5605-030-001-829,ELCO,8.1*5.5*0.95	75H00304-00	1	CON700	
12	Connector SIM Card,6P,2.54Pitch,CLE1006-1601F,SMK,Pb-FREE	75H00306-00M	1	U505	
13	Connector I/O,AXR512286803,22P,0.5mm,Matsushita,15.7*7.3*3	75H00312-00	1	CON704	
14	Connector RF,4P,LPC TP-1,120220-0129,ITT Cannon,Pb-FREE	75H00321-00M	1	SW1	
15	Connector B to B,60P,0.4mm,female,24-5605-060-001-829,Pb-FREE,Kyocera	75H00328-00M	1	CON702	