Service Manual
for XDA

HTC Proprietary
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HTC Corp.
Engineering Mobility

TITLE: Service Manual for XDA

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0.1	Feb. 08, 2002	Fist Draft	Technical Support	Carlos Lee		
1.0	Mar. 01, 2002	First Release	OEM Product Sustaining	Carlos Lee		
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2.1	Oct. 17, 2002	Update 64MB P/N	TSE	James Kao		
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1.Introduction

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

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

2.Product Specifications

2.1 Product Configuration

Standard Package

Model name	HTC Part Number	Customer Part Number	Description
Main Unit (XDA)	80H00085-50		
USB Cradle	80H00090-00		
Stylus	74H00083-00		
AC Adapter	79H00016-00		
UK Plug /AC Adapter	79H00019-10		
EU Plug /AC Adapter	79H00019-20		
Australia Plug /AC Adapter	79H00019-30		
DC Jack Converter	75H00146-01		
Pouch, Leather Case	70H00012-00		
Service Kit	93H00013-00 (ENG) 93H00013-01 (Australia) 93H00013-10 (GER)		Microsoft ActiveSync3.5, Outlook2002
Quick Start Guide	91H00136-00 (ENG) 91H00136-10 (GER)		
User's Manual	91H00135-00 (ENG) 91H00135-10 (GER)		
Warning Flyer	91H00153-00 (ENG) 91H00153-10 (GER) 91H00153-20 (NL)		
Warranty Card	91H00177-00 (ENG) 91H00177-01 (Australia) 91H00177-10 (Asia)		

2.2 Specifications of XDA

Item		Specification
Platform		• Windows CE with Merlin OS - English, French, German, Italian, Spanish • Combined GSM/GPRS and PDA. • 2 logical block (PDA and GSM/GPRS) solution, layout is integrated into one module • GSM/GPRS can be turned off to let PDA to run alone
Outside Dimensions		● 72.7(W) x 17.8(D) x 129.0 (H) mm (3 in. x 0.7 in. x 4.9 in.) ● Volume 140cc
Weight		186.5g
Operating conditions		Temperature: 0℃ to 40℃, Humidity: 90% RH • Temperature capable of charging: 5℃ to 35℃ (41℉ to 95℉) (According to the operating status, the charging may pause even when the ambient temperature is below 35℃ (95℉).)
Built-in battery	Type	Rechargeable Li-Ion Polymer Battery
	Continuing operating time	Approx. 7 hrs with a minimum communication time of 2.5 hrs (voice call continuously, PDA off while voice call, LCM off, at nominal RF Tx. Power level 29dBm, 50% of speech of running time) Standby: 100 hrs
Memory keeping time		Approx. 30 hours If left at ambient temperature of 25℃ (77℉) after the power has become unable to turn on. Note: Continuing operating time and memory keeping time vary according to the charging condition, ambient temperature, operating condition, etc.
GSM/GPRS Functional Block		
GSM Dual band		E-GSM900- 880-915, 925-960MHz GSM1800-1710-1785, 1805-1880MHz

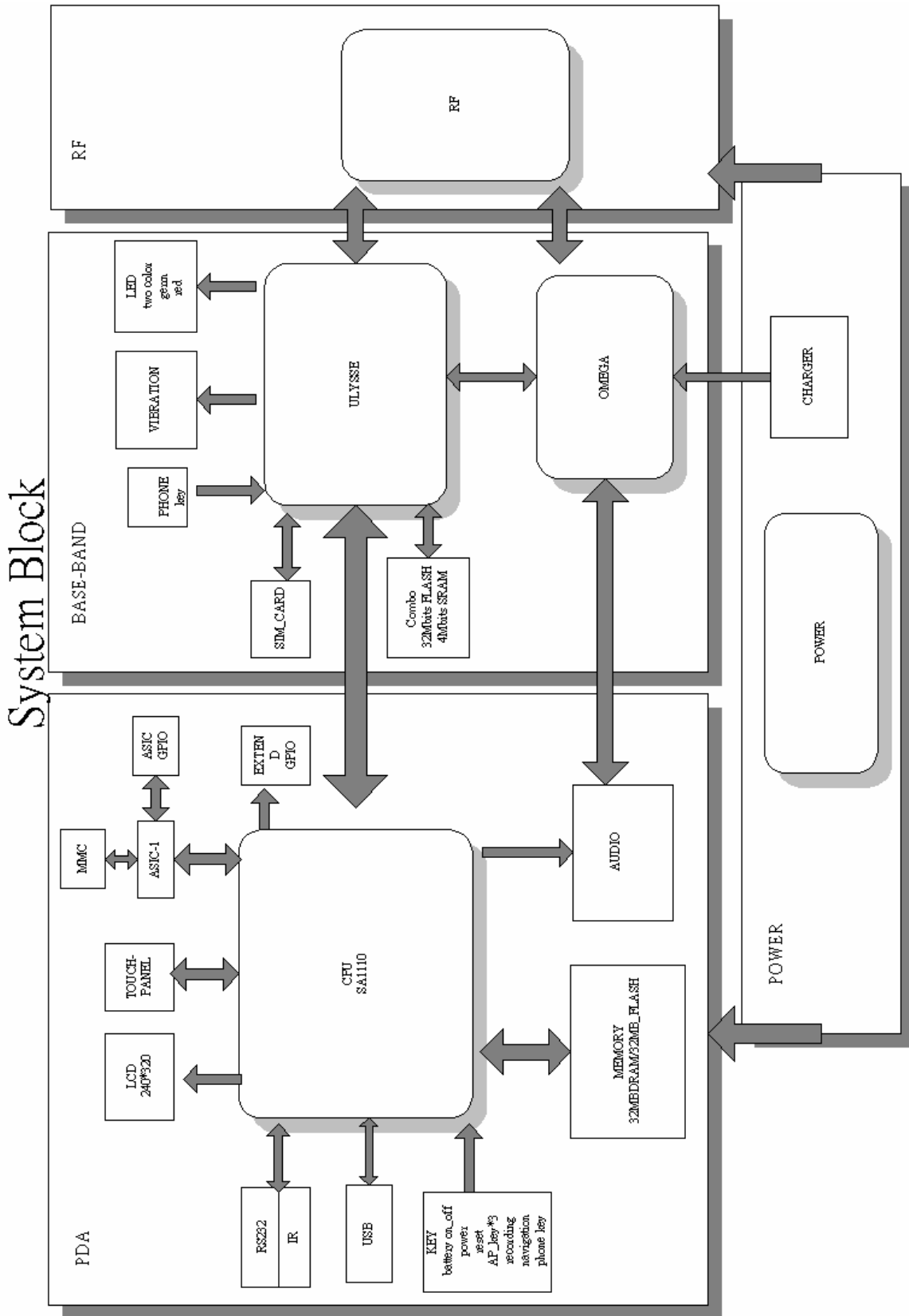|		
Memory	Combo Flash ROM (4MB) and SRAM (512KB)	
SIM	3V SIM Operation	
WAP/HTML	MS Pocket IE browser	
GPRS	GPRS Class B, Multislot class 8 (4R1T) WAP over GPRS Encryption GEA1&2 support GPRS indicator	
PDA Functional Block		
Processor	Strong ARM SA-1110	
Clock frequency	206MHz	
Memory (RAM)	64/32MB SDRAM ⇨ 32-bits data bus, SyncDRAM. ⇨ 64/32MB for Standard Device.	
Display	High Reflective color TFT, 240x320 pixels, 4,096 colors	
Interface	Wireless	Antenna
	GSM/GPRS	Plug in SIM card
	SD card slot	Possible to insert SD memory card or MMC card
	Infrared port	Infrared IrDA SIR X1
	Stereo headphone	Ø2.5mm, stereo mini plug with Microphone and Phone pick up button, volume adjust are also included.
	Cradle connection port	Cradle combo connector (22pin)- Serial, USB Slave, power signals and Audio (support Car kit)
AC adapter	INPUT: 100-240V AC, 0.2A, 50-60Hz OUTPUT: 5V DC, 1A typical	

2.3 Specifications of Earphone Headset with Microphone

Item	Specifications	Description
Pick up Phone / Mute	Button module with built-in MIC.	Press to pick up incoming call. Or press to Mute during conversation.
Headset Volume	Volume up and down	
Plug	DIA 2.5mm 4 Poles Jack	
Cable length	Approx. 110 cm	Distance from Plug to Pick up Phone / Mute unit.

2.4 Specifications of AC Adapter

Item	Specifications	Description
Input rated voltage	AC 100 – 240 (V)	
Input power	20 (W)	
Input frequency	50 / 60 (Hz)	
Output voltage	5 (VDC)	Tolerance is +/- 5%
Output current	1.0 (ADC) Max.	

3. System Block Diagram

System Block

RF

RF

BASE-BAND
- LED two color green red
- VIBRATION
- PHONE key
- ULYSSE
- OMEGA
- CHARGER
- SIM_CARD
- Combo 32Mbits FLASH 4Mbits SRAM
- POWER

PDA
- ASIC GPIO
- EXTEND GPIO
- MMC
- ASIC-1
- TOUCH-PANEL
- CPU SA1110
- AUDIO
- LCD 240*320
- MEMORY 32MBDRAM/32MB_FLASH
- RS232
- IR
- USB
- KEY battery on_off power reset AP_key*3 recording navigation phone key
- POWER

4. Servicing Tools

This chapter provides information for the servicing tools for XDA.

List of Servicing Tools

No.	Item	Use	Remark
1	USB or Serial Cradle	Check for Cradle I/F (Serial communication only)	
2	USB DATA interface Cable	Check for Cradle I/F (USB communication only)	
3	Special Made Plastic Stick	Disassembling for XDA	
4	SD Memory Card	For SD card test	
5	Earphone Headset	For Audio test.	
6	AC Adapter	Power supply to XDA.	

5. Assembling and Disassembling

5.1 Disassembling

	Tools needed for Assembling and Disassembling the XDA 1. Lens Cleaning Tissue. 2. Flat Screw Driver 2.4mm 3. Philip Screw Driver #0. 4. Torex Screw Driver T6X40 5. Special Made Plastic Stick. 6. Tweezers.
	Remove the Stylus, SD Card slot Filler, and the Audio Jack Rubber Insert.
	Next, check where SIM Card compartment in case the SIM Card has been left inside. To remove the SIM Card, use the Stylus to open de door as indicated in the picture.
	Push the SIM Card Lock Release with the Stylus in the location shown in the picture to eject the SIM Card.

	The SIM Card will be ejected and then extract the card.
	The Stylus is equipped with a Reset Pin. Turn the plastic part to release from Stylus.
	Before attempting to disassemble the unit, Please make sure that the **main battery switch** has been **switched OFF**, AC adapter has been disconnected. To switch OFF the battery, refer to the right lower side of the unit, using the Stylus Rest Pin, slightly push the pin into the hole as indicated on the left. Push The Main Battery Switch ONCE to switch it ON; push it once again to switch it OFF.

	To open de case, remove 4 screws at the rear side of the unit. Note that there is 2 types of screws are used. The Upper two screws are Standoff type with flat slot. (72H30051-00). The Lower two screws are Torex type screws. (72H30052-00).
	Once the 4 screws have been removed from the Back Housing, Use the Plastic Tool to open the housing. Insert and gently twist into the gap at the between upper and lower case with the FLAT side of the tool.
	Start this action on the left lower corner of the unit. Note that the force applied is toward the Front side direction.

	Once the first hook has been released, use the Plastic Tool, slide the tip of tool along the gap of the unit to unlock the rest of the hooks.
	Then, for the other side of the unit, also start it at the point near the cradle connector.
	Squeeze it in the direction shown here and slide it toward the left side.
	Continue sliding the plastic tools along the unit's border line and stop before the antenna.

After ALL the hooks around the perimeter of the unit, open the Rear Housing of the unit as shown in the picture.

AT this stage, if the defect part corresponds to the Main Board or LCD and Front Panel, please continue disassembling the Module on the left.
If the problem resides in Battery Pack, Vibrator, or Back Housing.

Next, remove the 3 Flexible Cables from the Main Board, the LCD PFC, Touch Panel FPC, and Front Light FPC.

For LCD PFC, use your finger 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.
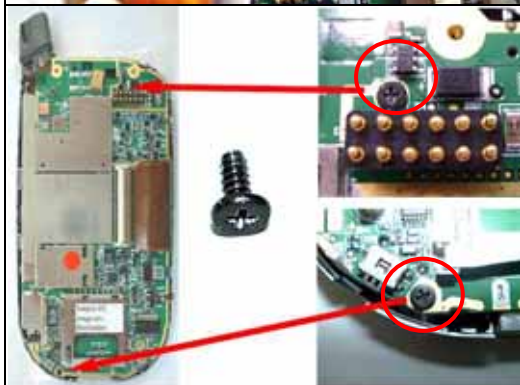Additional practices need to be explained

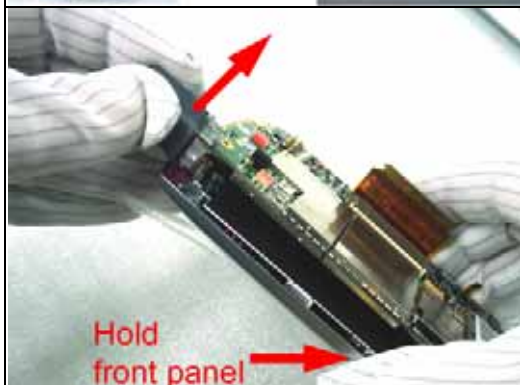|	
	Next, to remove the Touch Panel FPC, unlock the connector lock with a tweezers.
	Then, gently pull out the Touch Panel FPC with the tweezers as indicated in the picture. Repeat the same procedure to remove the Front Light FPC which is located next to the Touch Panel Connector.
	To remove the Main Board, unfasten two Philip type screws (72H30026-00) from upper right corner and lower left corner of the Main Board.
	Then remove the Main Board by holding the front panel first and lift the MB by the Antenna as shown in the picture.
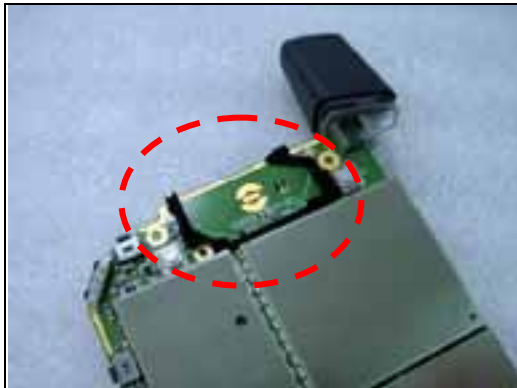
This rubber acoustic cushion is very easy to be left (forgotten) on the M/B. it must be removed and installed to the new board if it is changed.
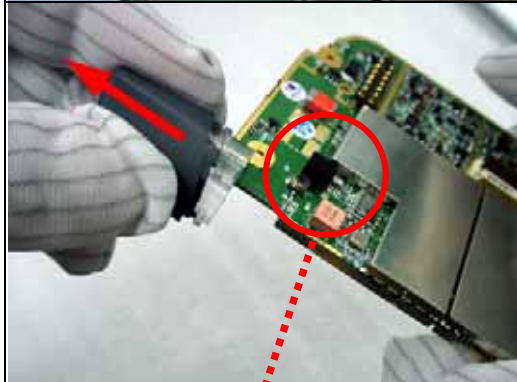

If the Main Board has to be replaced, remove the Antenna by pulling it out as straight as possible in the direction indicated in the picture.

Note: There's a black spacer rubber cushion marked in the red circle. Remember to place a new one on the new M/B in the exact same location.

a>b>c where
b=height
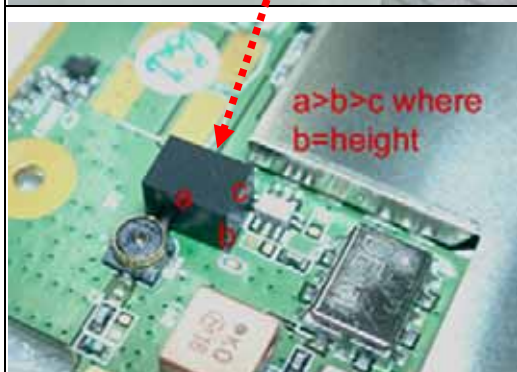
The P/N for this spacer rubber is 76H00239-00. Please make sure the orientation of the rubber is indicated in the exact location next to the RF Switch. Remember to place this rubber on the New Main board.
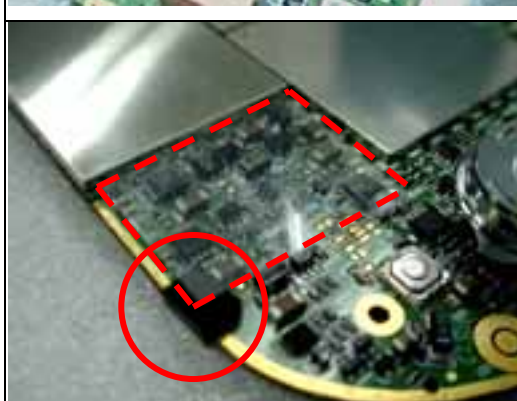
ON THE OTHER SIDE of the M/B, there's a transparent mylar 76H00228-00, it should also be placed on the New Main board on top of the other spacer rubber, 76H00230-00.

|	
	Be careful not to press the red dotted area, the SD Card socket. Same for all other metallic shielding.
	The Navigation Button has to be removed, too. Then the Main Board is ready to be replaced.
	If the Vibrator needs to be replaced, or the Back housing will be changed, remember to remove the Vibrator assembly from the Back Housing.
	If the Battery Pack has to be replaced, inter the Flat-end of the plastic tool between the battery pack and the Back Housing, then gently twist the tool straight in the central area beneath the battery pack gently until its top end then lift it upwards slowly.
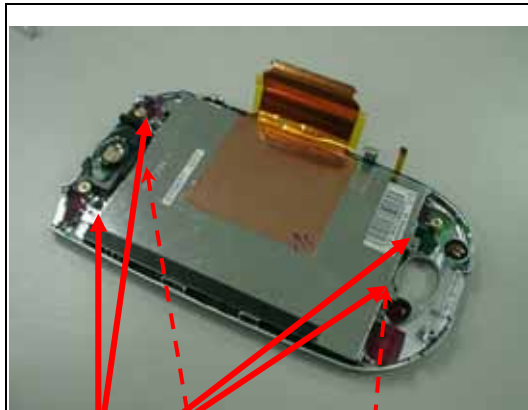
	To Disassemble the LCD Module Unfasten 4 screws (72H30026-00) from the locations on the LCD Module as shown in the picture.
	To remove the metal brackets Once the screws are removed, there're two metal brackets should be removed. One is longer, the top bracket 72H00173-00; the shorter is bottom bracket 72H00135-00.
	Hold the entire assembly as seen in the picture and push the LCD Panel from the front side to remove the LCD Module.

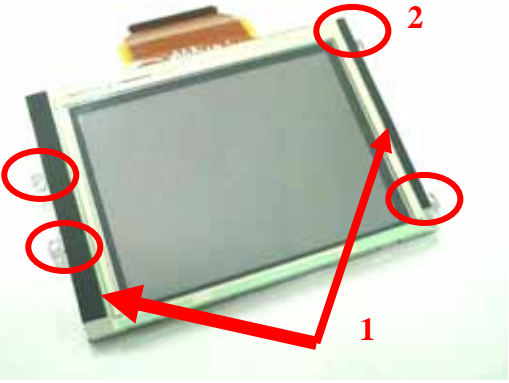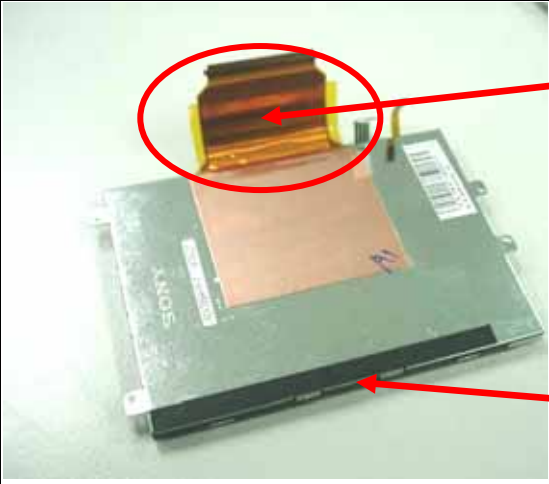|	
	If the Speaker or Microphone, or the Front Bezel need to be replaced, go to next page to continue
	If the Speaker is defective, remove it directly from the Bezel.
	Be reminded there's a Rubber Seal on the top and bottom of the Speaker module, both of these Seals should be installed correctly to prevent acoustic problems.
	If the MIC has to be replaced, just take it out as shown in the picture. Note that there's also a rubber seal under it.

The disassembly procedure is finished.

5.2 Assembling

If it's a New LCD Module (80H00222-00), make sure the following parts are properly attached to the module before assembling
1. Spacer Rubber 76H00240-00 (Wide)
   Spacer Rubber 76H00241-00 (Narrow)
2. "O-Ring Spacer (76H00264-00)

The LCD FPC must be covered by placing a solder-proof tape to avoid short circuit with the Mainboard. Ask logistics for this tape.

Place a poron 76H00238-00 on the back of the LCM.

To Assemble the Front Panel Assembly,
Place the Bezel up-side-down on a smooth and clean surface to prevent from scratch.

Then align the screw holes to the corresponding stand-offs on the Bezel and place the LCD Module on top.

	Place the metal brackets in the corresponding location and fasten 4 screws. **Screw Torque: 0.9±0.1 kgw/m²**
	If the Microphone is being replaced. Please check the following. 1. The presence of the black rubber Cushion 76H00223-00. 2. Then install the microphone in place.
Pins 	Place the navigation button on the Mainboard Note that the button has two pins, these pins must be facing up to the top of the PDA. The correct installation should look as the top picture on the left.
	This is the SIM Door Switch on the Main Board, Pay special attention not to damage this switch while handling the Main Board. The IMEI number label is located on top of Main Board as indicated on the left. It is also found in the unit by tapping Start→ Settings→ System→ Device Information→Identity. This number should be printed in the new label. Keep the Serial Number and Part Number the same.
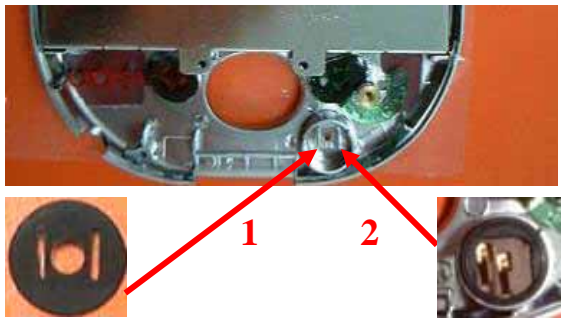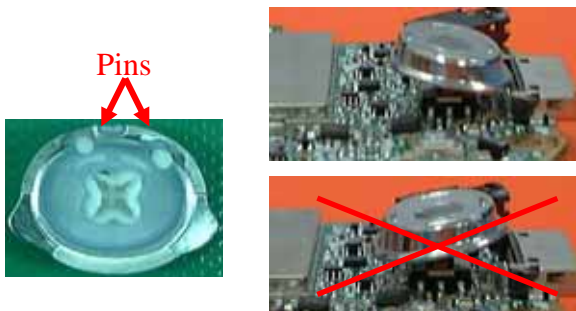
	Insert the Antenna onto the Main Board. Keep in mind the correct orientation of the Antenna.
	Install the speaker on the front panel. Important Note: The speaker must be placed in the direction as shown in the picture. The Left Contact terminal should look as a "C" mark. Then check the MIC.
	To assemble the Main Board, place the Main Board fasten two Philip type screws (72H30026-00) from upper right corner and lower left corner of the Main Board. **Screw Torque: 0.9±0.1 kgw/m²** **After that place a Tamper Proof Label on the upper screw head.**
	Then insert the LCD FPC into the connector and lock it by pressing the brown bar down.
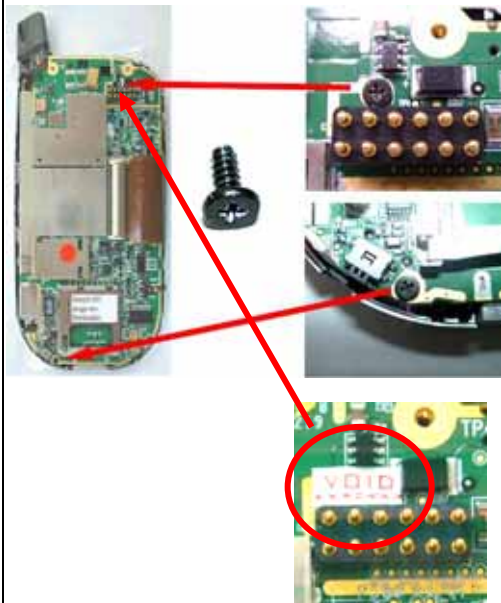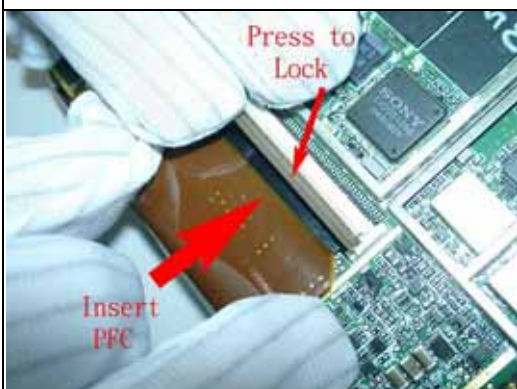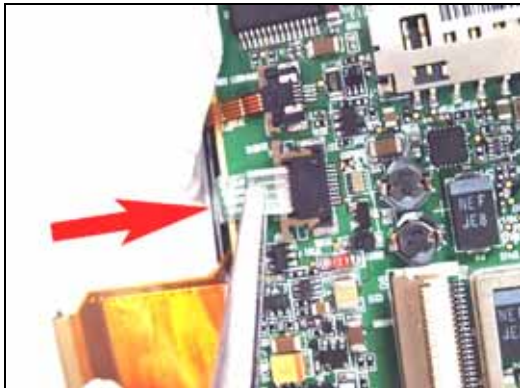
	Next, insert the Touch Panel FPC with the help of a tweezers.
	
	    1. Make sure the connector is unlocked.
	    2. Align and insert the FPC properly.

	Push the connector **lock** to fix **the Touch panel FPC**. It is much easier to do it with the finger. Repeat same procedure to connect Front Light FPC
	When inserting the Front light FPC, make sure to fully insert it completely to the end To assure the proper contact. For easy insertion, insert with an angle of 45 degrees.
	Next, Close the Front Bezel and Back Housing starting from the top edge of the unit.
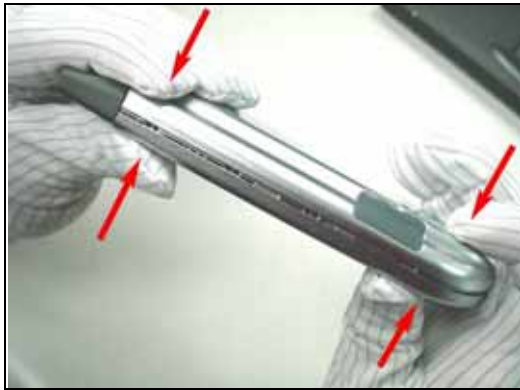
	Then Close the entire Housing and Press the upper and lower housing along the edge of the unit.
	Repeat the procedure to close the rest of the gaps Gently press both housings. Be careful not to press on the LCD panel area.
	Then, fasten 4 screws at the rear side of the unit. Note that there is 2 types of screws are used. The Upper two screws are Standoff type with flat slot. (72H30051-00). The Lower two screws are Torex type screws. (72H30052-00). **Screw Torque: 1.2±0.1 kgw/m²**

	The Unit now is ready for Function Test and RF Test. Once passed all the test, If M/B was replaced, the Regulation Label on the unit should be printed with the new IMEI number. Find it in the unit: Start→Settings→System→Device Information→Identity.
	Note that in the lower right corner of the label, there's a 3-digit code, it should be also printed and kept the same as before the repair.

The Unit Assembly is done ready for further tests.

6. Problem Diagnostics

6.1. List of Test Jigs

Item Name	Usage	Remark
RS-232 Serial Cable	For data port test	
USB Cable	For data port test	
Special Plastic Tool	For unit disassembly	
AC Adapter	For battery recharge and power related tests	
Earphone with Microphone	For audio test	
SD Card or MMC Card	For write protect, read and write test	

<Hardware Requirement for PC>

- O.S.: Windows 98/ME/2000
- CPU: Pentium 166MHz or above
- Memory: 64MB
- PC Link: ActiveSync 3.5

6.2. Classification of Non-Conformity

Non Conformity Types	Customer, Retailer Misjudgment

1・Power	Main unit does not respond to Power Button
	Main unit does not respond to Battery Switch

2・Operational	Touch Panel does not respond to screen tap
	Buttons do not respond

3・Display	Unusual vertical/horizontal lines or partial display
	Front Light does not turn ON/OFF

4・SD Slot	SD Card cannot be used

5・Communication	PC Connection (USB/Serial) not possible
	Wireless Connection (GSM/WAP/Pocket IE) not possible
	IrDA Connection not possible

6・Memory	Data retention related problem

7・Battery	Battery Pack does not Start
	Battery Discharges Quickly even after fully charged
	Battery Pack Does not Recharge

8・Sound	No sound from Speaker or Distorted sound

9・Recording	No recorded sound or distorted sound

10・Others	Housing Cosmetic damage

6.3 Troubleshooting & Repair

<u>Before attempting to Diagnose the unit received for repair, perform a Full Reset (Cold Boot) in advance.</u>

$1-A$・**Main Unit Does Not Respond to Power Button**
$1-B$・**Main Unit Does Not Respond to Battery Switch**

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(1) Make sure the Battery Switch is correctly pushed to activate the battery pack.

(2) Make sure the SIM Door is closed properly. If the door is damages, replace the back housing.

(3) Connect the AC Adapter, maybe the built-in battery pack is exhaust.

(4) Dismantle the Main Unit and check whether battery pack is correctly assembled.

(5) Check the Power Button & Battery Switch.

(6) Try with another battery pack.

(7) Replace battery pack if necessary.

(8) Check all connections including LCD FPC to Main Board. Try with another Main Board.

(9) Replace Main Board if necessary.

(10) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

$2-A$・**Touch Panel Does Not Respond to Screen Tap**

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(1) Dismantle the unit, check the perimeter of Display between Front Bezel and Touch Pane surface for unusual foreign objects. Clean it, reassemble the unit and check the panel's function again.

(2) Check the connection of Touch Panel FPC whether is properly connected.

(3) Try with another LCM.

(4) Try with another Main Board.

(5) Replace LCM if necessary

(6) Replace Main Board if necessary.

(7) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

2—B・Buttons Do Not Respond

(1) Dismantle the unit, check the status of switches on the Main Board and the plastic parts of button of the Button not responding.

(2) Try with another Main Board or Front Bezel.

(3) Replace Main Board or Front Bezel if necessary.

(4) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

3—A・Unusual Vertical / Horizontal lines or partial display

(1) Check the connection of LCM FPC whether is properly connected.

(2) Try with another LCM.

(3) Try with another Main Board.

(4) Replace LCM if necessary

(5) Replace Main Board if necessary.

(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

3—B・Front Light Does Not Turn ON/OFF

(1) Check the connection of Front Light FPC whether is properly connected.

(2) Try with another LCM.

(3) Try with another Main Board.

(4) Replace LCM if necessary

(5) Replace Main Board if necessary.

(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

4—A・SD Card cannot be used

(1) Check whether SD or MMC Card is fully inserted to the slot until you hear a click.

(2) Try with another SD / MMC Card and Check whether it is Write Protected.

(3) Try with another Main Board.

(4) Replace Main Board if necessary.

(5) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

5—A．PC Connection (USB / Serial) not possible

(1) Check whether "Connection Settings" in the MS ActiveSync is properly set.

(2) Check whether it connects with other cables or cradle, customer's cable might be damaged.

(3) Check the external appearance of the connector on the unit whether it is physically damaged.

(4) Replace Main Board if necessary.

(5) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

5—B．Wireless Connection (GSM / WAP / GPRS) not possible

(1) Make sure the user has been contacting the Carrier for SIM Card validation and activation.

(2) Make sure the Wireless Connection Settings has been properly set.

(3) Make sure the SIM Card is properly inserted to the SIM compartment. Make a life call or test it with the RF Test Station (Antenna Test).

(4) Dismantle the Main Unit and check whether the Antenna is properly installed.

(5) Try with another Antenna.

(6) Try with another Main Board if necessary.

(7) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

5—C．IrDA Connection not possible

(1) Make sure the IrDA port settings on the Notebook or PC are properly set.

(2) Make sure the IrDA function is properly activated on the Pocket PC and on the other device.

(3) Make sure there's no obstruction between the two devices in connection and within the distance.

(4) Check the IrDA window whether it is broken or cracked. Replace Front Bezel if necessary.

(5) Replace Main Board if necessary.

(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

6－A · Data Retention related problem

(1) Data introduced by User might be lost when Battery has drained completely.

(2) Ask user to charge the Main Unit when latest warning message pops up.

(3) Ask users to back up their data to the PC or SD card when expect stop using the unit for long period of time, for example, more than one week.

(4) Charge the Main Unit and check if data looses even the Battery pack is charged or at least The unit still can be powered on without AC Adapter.

(5) Check whether AC Adapter is functioning properly.

(6) Check whether the condition of Battery Charging status is correct.

(7) Dismantle the unit and check the appearance of Battery Pack.

(8) Replace Battery Pack if necessary

(9) Replace Main Board if necessary.

(10)Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

7－A · Battery Pack does not start

(1) Make sure the SIM Door is closed properly. If the door is damages, replace the back housing.   Data introduced by User might be lost when Battery has drained completely.

(2) Connect to the AC Adapter and see if it takes charge. Also check AC Adapter condition.

(3) Ask users to back up their data to the PC or SD card when expect stop using the unit for long period of time, for example, more than one week.

(4) Charge the Main Unit and check if data looses even the Battery pack is charged or at least The unit still can be powered on without AC Adapter.

(5) Check whether AC Adapter is functioning properly.

(6) Check whether the condition of Battery Charging status is correct.

(7) Dismantle the unit and check the appearance of Battery Pack.

(8) Try with another Battery Pack or Replace Battery Pack if necessary

(9) Try with another Main Board or Replace Main Board if necessary.

(10)Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

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7－B · Battery discharges quickly even after fully charged

(1) Make sure the Battery Pack takes fully charge with AC Adapter.

(2) Check whether the condition of Battery Charging status is correct.

(3) Dismantle the unit and check the appearance of Battery Pack.

(4) Try with another Battery Pack or Replace Battery Pack if necessary

(5) Try with another Main Board or Replace Main Board if necessary.

(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

7－C · Battery Pack does not recharge

(1) Make sure the Battery Pack takes fully charge with AC Adapter.

(2) Check whether the condition of Battery Charging status is correct. Charge should be done in no more than 3 hours.

(3) Dismantle the unit and check the appearance of Battery Pack.

(4) Try with another Battery Pack or Replace Battery Pack if necessary

(5) Try with another Main Board or Replace Main Board if necessary.

(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

8－A · No Sound from Speaker or Distorted sound

(1) Check "Sound & Notifications" Settings in the unit for Sound Enabling.

(2) Make sure it's not MUTED.

(3) Dismantle and Check whether the Speaker is properly installed (Orientation)

(4) Replace Speaker if necessary.

(5) Replace Main Board if necessary.

(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

9－A · No Recorded Sound or Distorted sound

(1) Check "Sound & Notifications" Settings in the unit for Sound Enabling.

(2) Make sure it's not MUTED.

(3) Dismantle and Check whether the Microphone is properly installed (check or missing rubber)

(4) Replace Microphone if necessary.

(5) Replace Main Board if necessary.

(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

10－A・Housing Cosmetic damage

(1) Unless it is for Refurbishment, all housing replacement due to cosmetic damage shall be subject to be charged.

7. Diagnostic Program

7.1. List of Test Items (built-in Diagnostics)

No.	Item	Description	Remark
1	Auto Test	N/A	
2	RAM Test	RAM Check Size/Write/Read/Comparison test.	
3	Display Test	Test the LCD display quality.	
4	Touch Test	Touch screen alignment test. Suggest to test in WinCE	
5	Playback Test	Play sound with 8KHz|44.1KHz sample rates.	
6	Record Test	Record audio sound and playback it.	
7	Button Test	Test every most of button.	
8	Checksum Test		
9	USB Test	Suggest to test in Windows CE	
10	Sir Test	Suggest to test in Windows CE	
11	Series Test	Suggest to test in Windows CE	
12	F Light Test	Front light ON with in different brightness level.	
13	LED Test	Test the message LED.	
14	Battery Test	Check the status of battery and AC power.	
15	Vibrater Test	Test the function of the vibrater.	
16	SD Test	SD card Write/Read/Write Protect test.	
17	GSM Audio Test	Test The GSM Audio Path	

7.2 Test Items Operation

Power on the unit. While press and hold the Power Button, Reset the unit with the Stylus to enter the Test Mode. Then, press "Action" and wait for a few seconds.

How to select test item: Using navigation button -"Up" or "Down" to select the test items
How to execute the test program: Press "Action" to start the test

| No.	Item	Description	Possible cause if fail
1	Auto Test	Runs all test items listed here.	
2	RAM Test	Display Size and read/write test. It will show OK if pass. Stop on fail	Could be M/B issue

3	Disp Test	Unit prompts for different display page to detect the defect of LCD, lines or dots.	Could be LCD issue
4	Touch Test	Tap the cross mark (+) with stylus on the correct location. Fail if no reaction	Could be T/P issue
5	Play Test	Play the fist tone with 8KHz/L-channel, then play the second tone with 44.1KHz/R-channel. Hear the sound and notice if bad sound quality happens	Could be speaker or M/B issue
6	Record Test	Press 'Volume' to record voice, then playback it. Check the record function is OK or not	Could be MIC or M/B issue
7	Btn Test	Press each button to know if it works. Follow up the instruction shown on the screen to finish the test item Stop on fail.	Could be switch board issue
8	Checksum	Verifies the checksum of the code.	
9	USB Test	Plug USB cable to connect PDA to PC then and check for the connection in WinCE.	Could be M/B issue
10	SIR Test	Prepare another unit as 'supporting' site. On test unit, please choose 'Test Target' and press action button to start test. Before test, make the IR ports of them face to each other.	Could be M/B issue Suggest to test it in Windows CE mode.
11	Seri Test	Check this item in Windows CE mode.	Could be M/B issue
12	FtLight Test	Front Light turns ON and Off	Could be M/B issue
13	LED Test	The message LED will blink and it last 5 seconds.	Could be M/B issue
14	Battery Test	Test main battery and AC power source. Insert AC power before test.	Could be main battery or M/B
15	Vibrater Test	Press action, units should vibrate	Check the vibrater
16	SD Test	Insert SD card (Enable Write Protect) and start test. Pull out the SD card if you see the message "Please Pull Out SD Card". Adjust lock switch to unlock site (Disable Write Protect, and insert it. Return to test menu if pass.	Could be M/B issue
17	GSM Aud.	Press Action, the audio path is opened. Speak to the built-in MIC, should hear it from the speaker	Could be M/B issue

8. Spare parts list & Exploded Diagrams

8.1 List of Spear Parts

Item	Description	HTC P/N	Using Q'ty
1	Rechargeable Battery, Li-Ion, 3.7V, 1500mAh	35H10008-80	1
2	Microphone, XDA	36H00002-00	1
3	Antenna, XDA	36H00029-00	1
4	Vibrator, XDA	36H00030-00	1
5	Speaker, XDA	36H00038-00	1
6	Ear Phone	36H00041-00	1
7	Pouch, XDA	70H00012-00	1
8	Button, Navigation, XDA	71H00252-00	1
9	Filler, SD Card, XDA	71H00260-00	1
10	Philip/slot Screw, T1.4*4.0, BEZ/LCD Holder, BEZ/M.B	72H30026-10	6
11	Screw, Standoff, M1.6*L4	72H30051-00	2
12	Screw, Trox, RD, M1.6*L4.5	72H30052-00	2
13	Bezel, Pre-Assy, XDA	74H00081-00	1
14	Housing, Pre-Assy, XDA	74H00082-00	1
15	Stylus, XDA	74H00083-00	1
16	Cover, Rubber, EXT, Battery	76H00192-00	1
17	Insert, Rubber, Audio, XDA	76H00197-00	1
18	RUBBER SPEAKER, CABINET, FRONT, 94HB, XDA	76H00221-00	1
19	RUBBER MICROPHONE, FRONT, 94HB, XDA	76H00223-00	1
20	INSULATOR, MYLAR, PCB, 94VTM-2, XDA	76H00228-00	1
21	SPACER, RUBBER, PCB, XDA	76H00230-00	1
22	SPACER, PORON, LCD, XDA	76H00238-00	1
23	SPACER, RUBBER, BATTERY, XDA	76H00239-00	1
24	SPACER, RUBBER, BTM, LCD, 94HB, XDA	76H00240-00	1
25	SPACER, RUBBER, TOP, LCD, 94HB, XDA	76H00241-00	1
26	Spacer, LCD Top, XDA	76H00264-00	4
26	Fragile Label	77H00013-00	1
28	Ac Adapter	79H00016-00	1
29	Plug For UK	79H00019-10	1
30	Plug For EU	79H00019-20	1
31	Plug For Australia	79H00019-30	1
32	LCD Module	80H00222-00	1

8.2 Exploded Diagrams
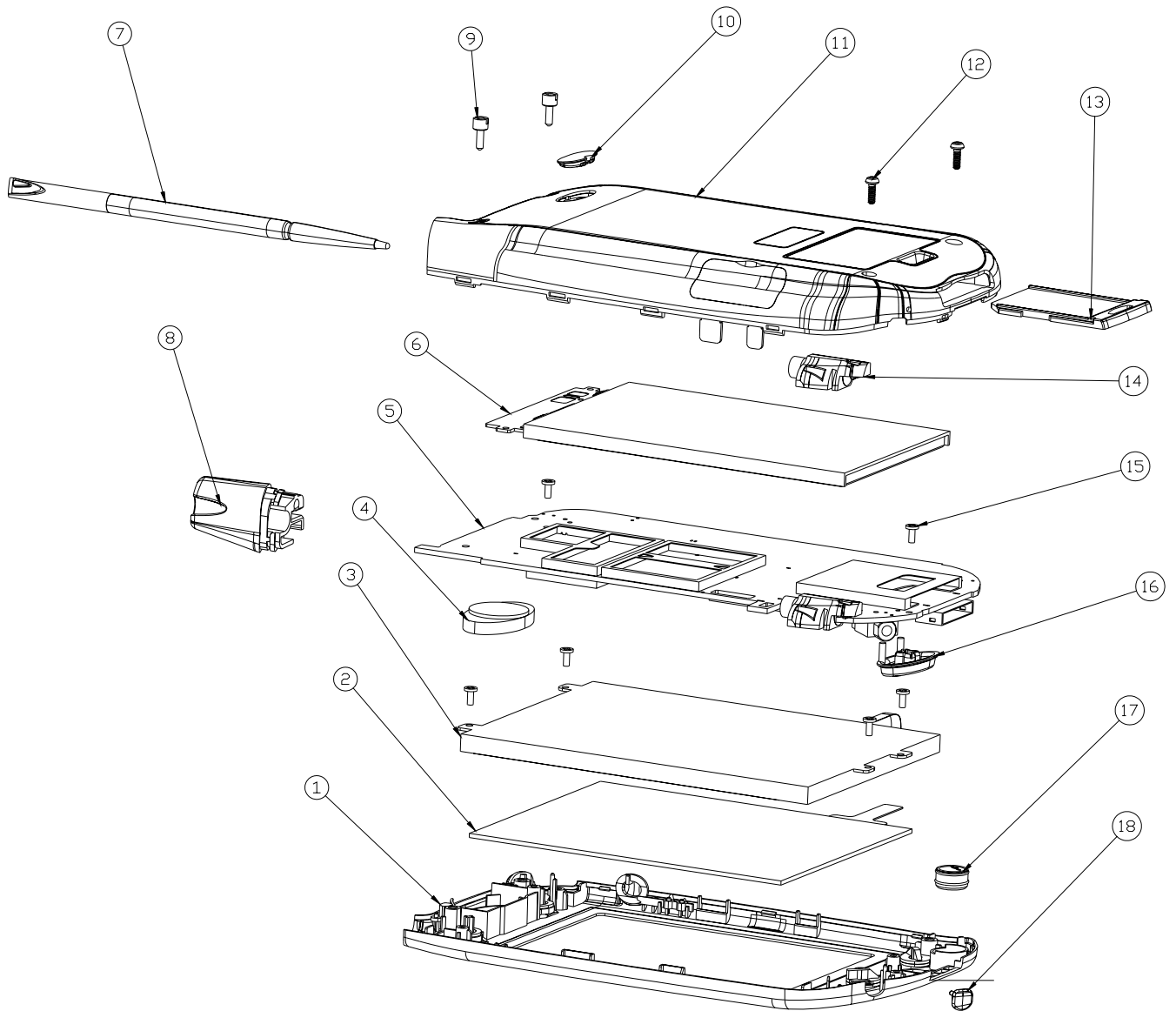
Appendix

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.
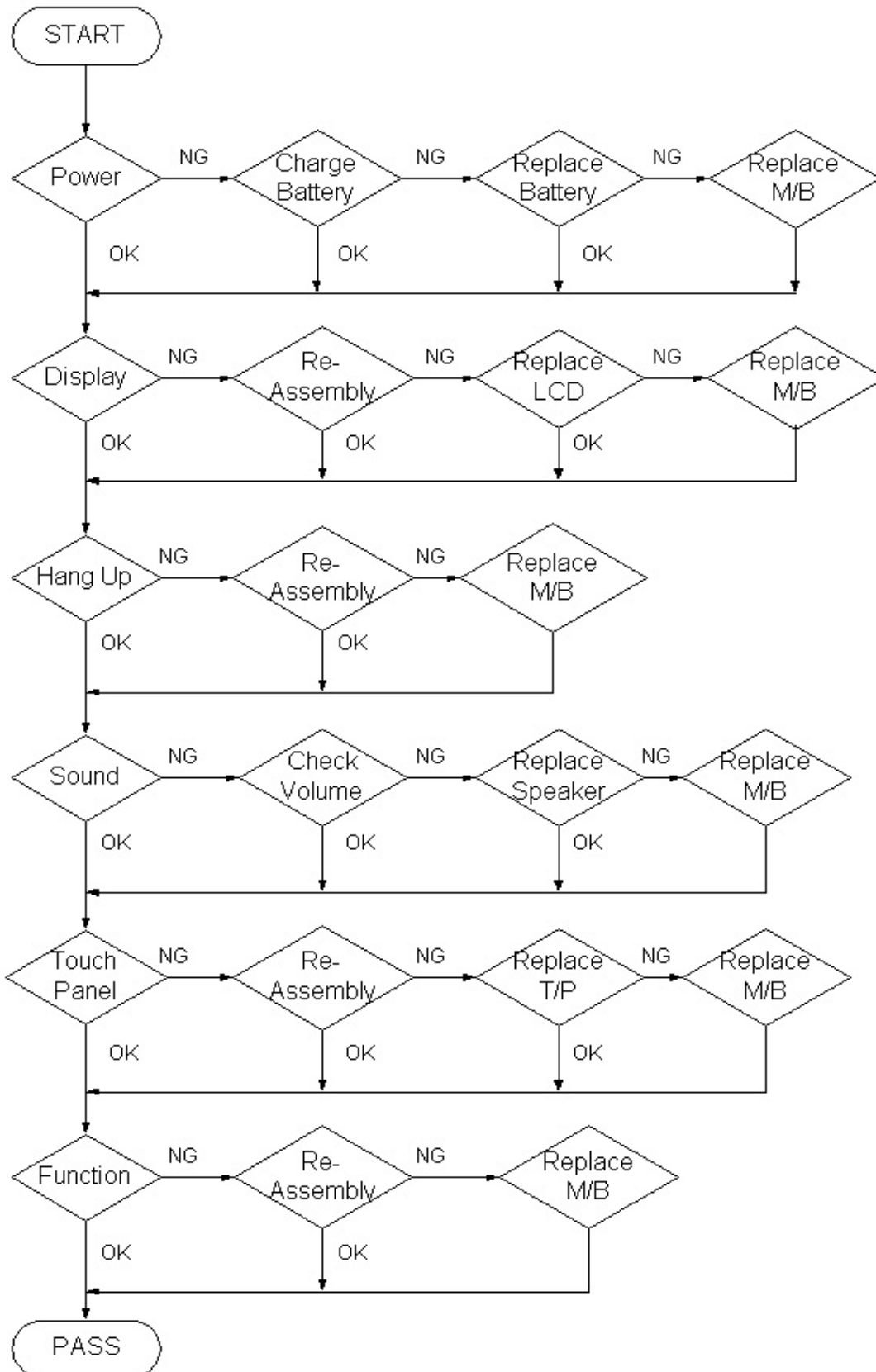
The following are failure symptoms that are typical by misjudgment

No.	Item	Possibility
1	No Power even the power button is pressed	Built-in Battery switch is switched OFF or exhausted.
		While Front 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 Front light. 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℃ and above 35~40℃ 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	Cards which are 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.

B. Repair Troubleshooting Guide

```
START
  │
  ▼
Power ──NG──► Charge ──NG──► Replace ──NG──► Replace
              Battery        Battery         M/B
  │OK           │OK            │OK             │
  ▼             ▼              ▼               ▼
  │◄────────────┴──────────────┴───────────────┘
  ▼
Display ──NG──► Re- ──NG──► Replace ──NG──► Replace
                Assembly     LCD            M/B
  │OK             │OK          │OK            │
  ▼               ▼            ▼              ▼
  │◄──────────────┴────────────┴──────────────┘
  ▼
Hang Up ──NG──► Re- ──NG──► Replace
                Assembly     M/B
  │OK             │OK          │
  ▼               ▼            ▼
  │◄──────────────┴────────────┘
  ▼
Sound ──NG──► Check ──NG──► Replace ──NG──► Replace
              Volume        Speaker         M/B
  │OK           │OK           │OK            │
  ▼             ▼             ▼              ▼
  │◄────────────┴─────────────┴──────────────┘
  ▼
Touch ──NG──► Re- ──NG──► Replace ──NG──► Replace
Panel         Assembly     T/P            M/B
  │OK           │OK          │OK            │
  ▼             ▼            ▼              ▼
  │◄────────────┴────────────┴──────────────┘
  ▼
Function ──NG──► Re- ──NG──► Replace
                 Assembly     M/B
  │OK              │OK          │
  ▼                ▼            ▼
  │◄───────────────┴────────────┘
  ▼
PASS
```

C. Wince & GSM Firmware Reflash Procedure

System Requirement:

-Windows 2000

-USB Cable or Cradle

-Serial (RS-232) Cable

-MTTY.exe

-ROM Image file

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

## A. Windows CE OS update withPC:
(You Only need to do this ONCE when New Update is received)

Requirement: (1) Mtty.exe tool ver.1.10 or above (2) USB cable or USB cradle (3) Window2000 or above (4) BIN OS ROM Image

1. Locate File in the same directory of Mtty.exe
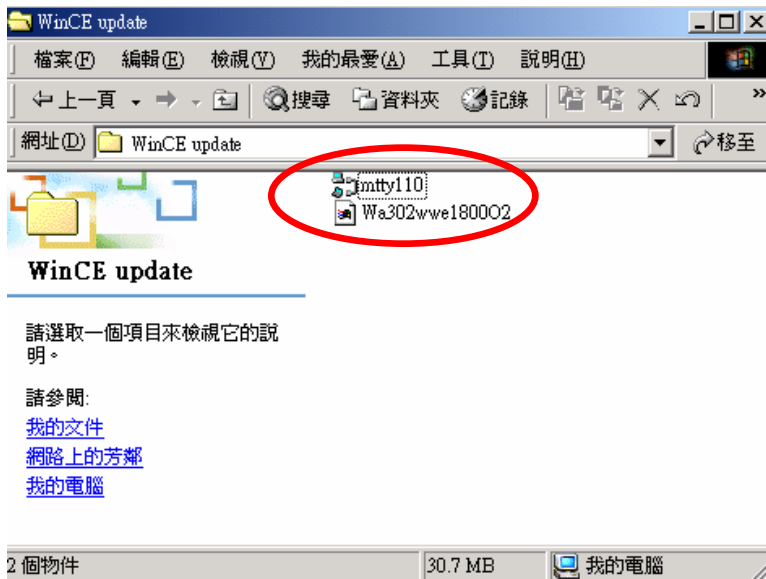
2. Uncheck USB and COM1 in Connection Settings in ActiveSync if you have installed the ActiveSync in your PC and make sure the USB port is available.
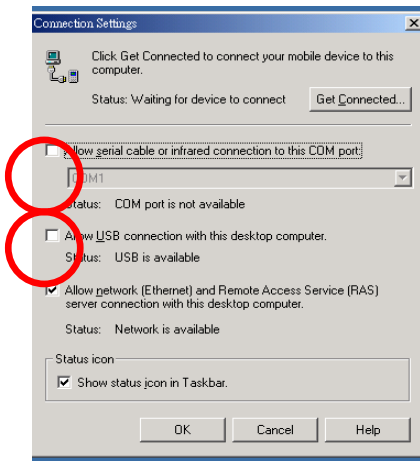
Note: The above actions are also valid when doing GSM Firmware Update.

3. Set the Unit into Bootloader Mode (While Press & Hold **Power, Reset** the units), wait for GSM OK on display and press Volume Control Key. Message on PDA Screen:

```
USB FLASH MODE
 ===============

   CONNECT USB
   CALBE NOW…
```
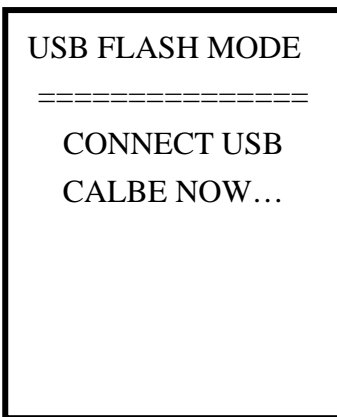
4. Connect the unit to the PC with USB cable or USB cradle.

5. On the PC side, run MTTY and select **USB** in **Open port settings** and **OK.**
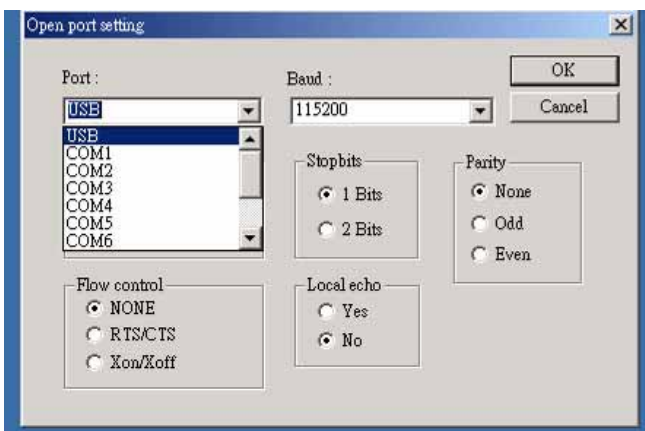
6. Then, the following display opens on the PC. Press **ENTER** and get the prompt "USB>"
→ type "l" (for load)→ space → File name {Wa302wwe1800O2.bin} don't forget the extension ".bin" and **ENTER**.

The process begins and wait for 5 to 6 minutes until it shows **Done**.

CAUTION! DO NOT REMOVE THE USB CABLE FROM THE PC OR PDA, FAIL TO DO SO MAY CAUSE DEVICE UNIT FAIL TO BOOT.
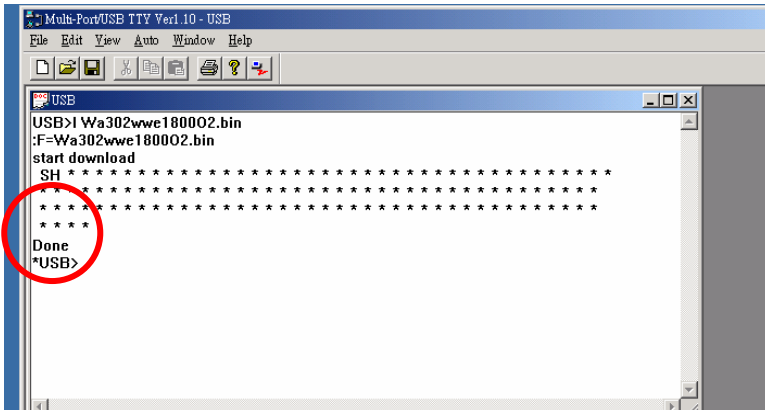
When Finished, disconnect the unit from the cable and perform a **Full Reset. It is mandatory.**

Important: Go to Checksum Verification on Page 4 to confirm the correct Checksum.

A. SD/MM Card Preparation for Windows CE OS update from an updated Unit.

Once you have updated the WinCE OS of a Unit (Check it in Start→Settings →System →Device Information→Version), you can update the SD/MM Card DIRECTLY from the Unit and use the updated Card to update other Units and so on. It is strongly recommended to use Exclusively Marked SD /MM Card for Windows CE Update ONLY to avoid confusion with other software updates such as GSM, Bootloader Update.

1. Set the Unit into Bootloader Mode (While Press & Hold **Power, Reset** the units), wait for GSM OK on display and press **App3** (Contact Key). Message on PDA Screen appears:

```
      FLASH TOOLS
===============
CE ROM       TO SD
BOOT         TO SD
CE+BOOT      TO SD
GSM ROM      TO SD
CE+GSM       TO SD
```

Make sure a 64Mb SD/MM Card is inserted to the Unit and select " CE ROM TO SD " with up/down key and select by pressing Action. The unit starts to download and wait for 5~6 minutes until message on disply shows "ROM Backup Success…PRESS ACTION TO EXIT".

Note. DO NOT SELECT OTHER OPTIONS THAN ABOVE SELECTED.
IMPROPER USE OF THIS UTILITY MAY CAUSE DEVICE UNIT FAIL TO BOOT.

B. Re-Flash Windows CE OS with 64Mb SD/MM

Caution! The unit must have at least 70% of battery capacity before starting the re-flash process. Charge the battery.

```
    SD     Download
===============
CARD TYPE:
CE OS
Press ACTION
to Download
      or
Press REC
```

1. Insert a SD/MM Card with updated ROM Image to the Unit.

2. Set the Unit into Bootloader Mode (While Press & Hold **Power, Reset** the units), the following message appears on the PDA:

Press Action to start downloading the image.

CAUTION! *DO NOT REMOVE THE SD/MM CARD DURING THE PROCESS. FAIL TO DO SO MAY CAUSE DEVICE UNIT FAIL TO BOOT.*

```
    SD     Download
===============
    Please Wait
      For
    Downloading


  PRG :005C0000
  END :02000000
  Flash Writing
```

Wait for 5~6 minutes to finish the process.

CAUTION! *DO NOT REMOVE THE SD/MM CARD DURING THE PROCESS. FAIL TO DO SO MAY CAUSE DEVICE UNIT FAIL TO BOOT.*

```
    SD     Download
===============
    Download
    Completed
  CheckSum OK!


  COLD   BOOT
   TO   RESET
```

Download Completed. REMOVE THE SD/MM CARD, AND PUT BACK THE SD FILLER, (If applicable)

Perform a **Full Reset** (COLD BOOT) to complete the process.
It is Mandatory.

Checksum Verification: *Once finished the Re-flash Procedure, it is necessary* to verify the consistancy of the file downloaded.

```
    ROM    CheckSum
     32mb    ROM
   ===============
   PDA CheckSum:
    0xE794CEA4
   GSM CheckSum:
    0x2DE5403D
   ----Done----
    Press Action
```

Set the Unit into Bootloader Mode [While Press & Hold **Power, Reset** the units, wait for GSM OK on display and press **Action** (Navigation Key).
DIAGNOSTICS TEST PROGRAMS MENU appears. Select CheckSum Test to verify the Checksum.
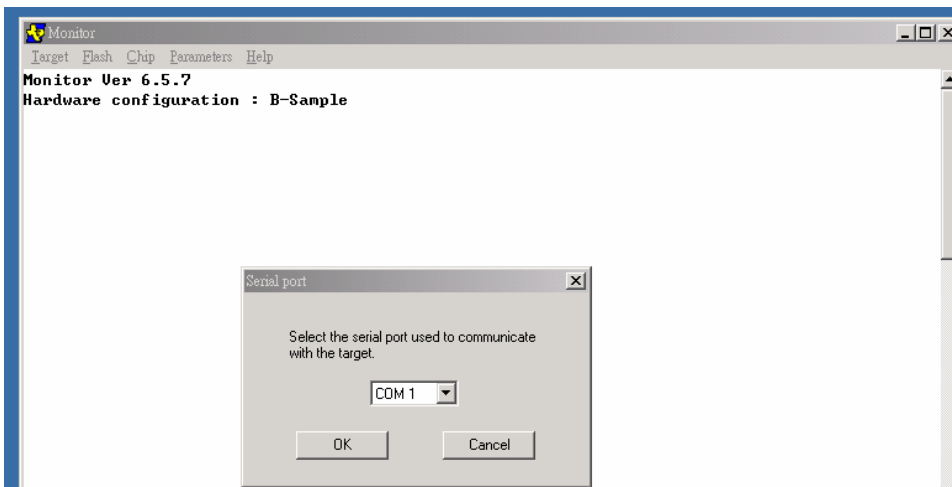
Important: EACH ROM IMAGE HAS ITS OWN CHECKSUM.
            IT IS BEING RELEASED ALONG WITH EVERY VERSION
UPDATE. CONTACT YOUR HTC/TSE IF YOU ARE NOT CLEAR.

E. GSM Firmware update:

Requirement: (1) Monitor.exe ver.6.5.7 or above (2) Serial (RS-232) Cable (3) Window2000 or above (4) GSM ROM Image
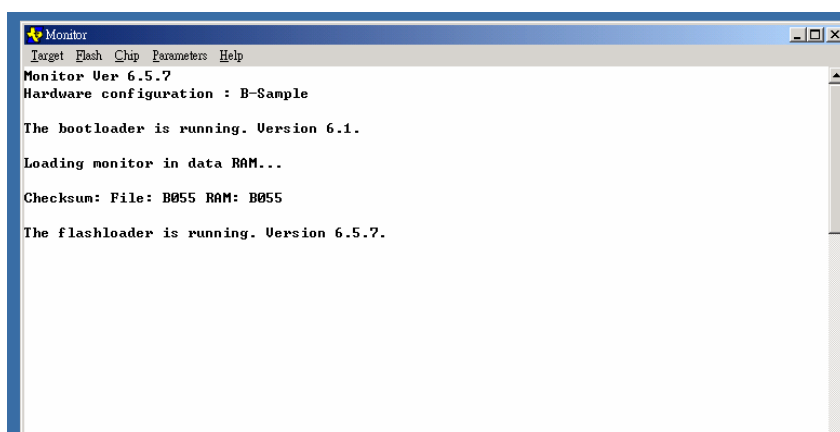
1. Run Monitor.exe and Select **Target** and **Connect**…
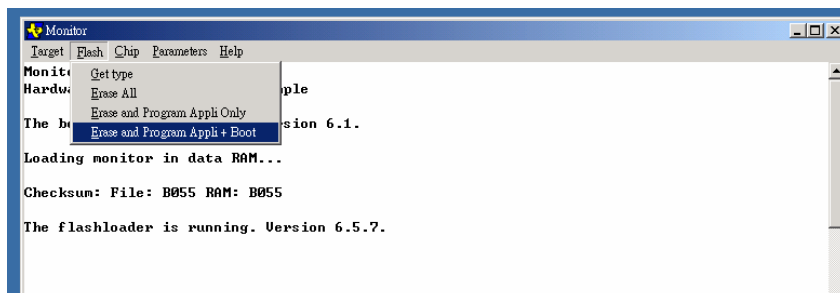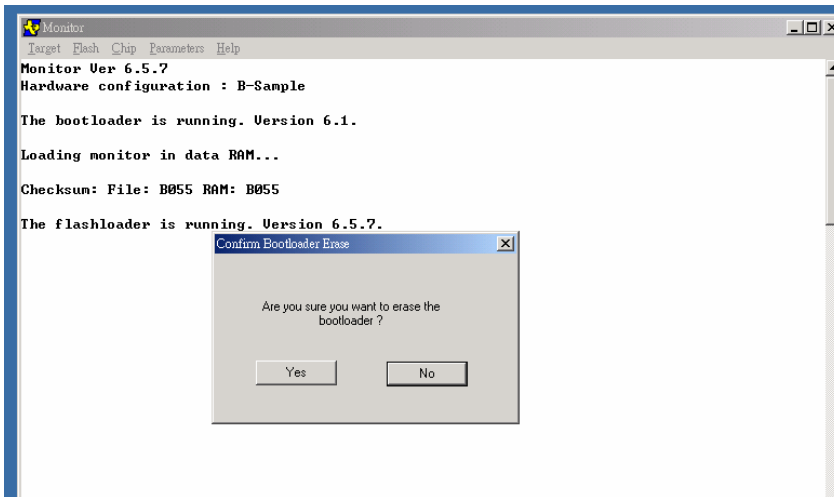
    The following dialogue box appears,

2. Press **OK.**
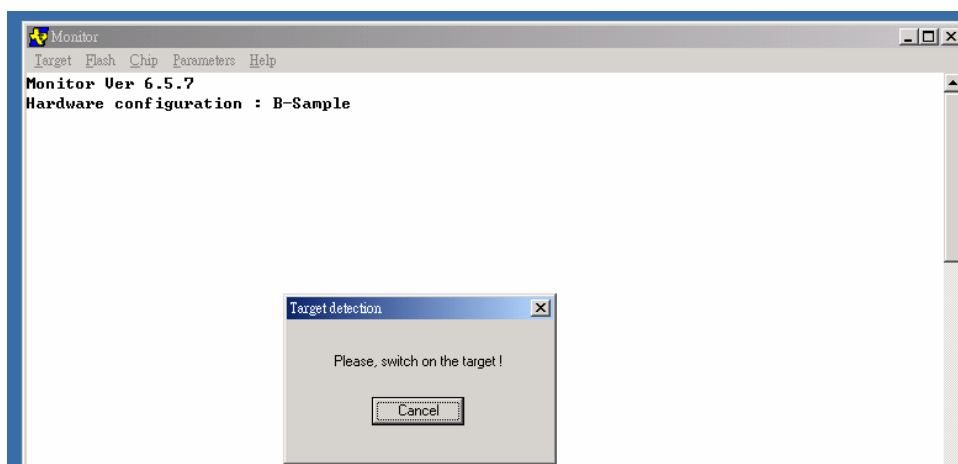
3. When the above dialogue box appears, connect the Unit to Serial(RS-232) Cable.

4. Set the Unit into Bootloader Mode [While Press & Hold **Power, Reset** the units,
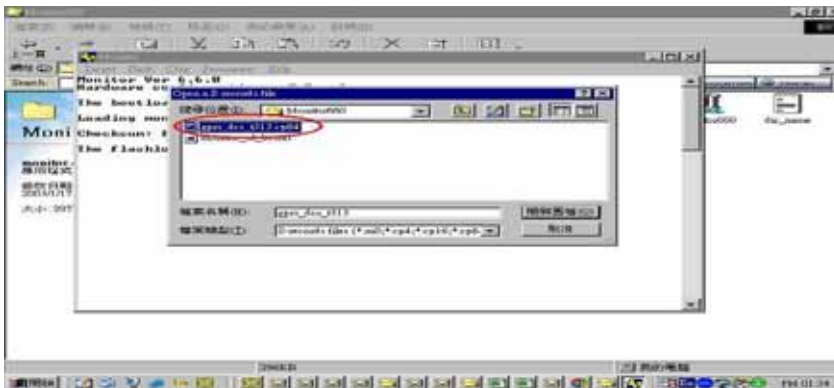   The following message appears:

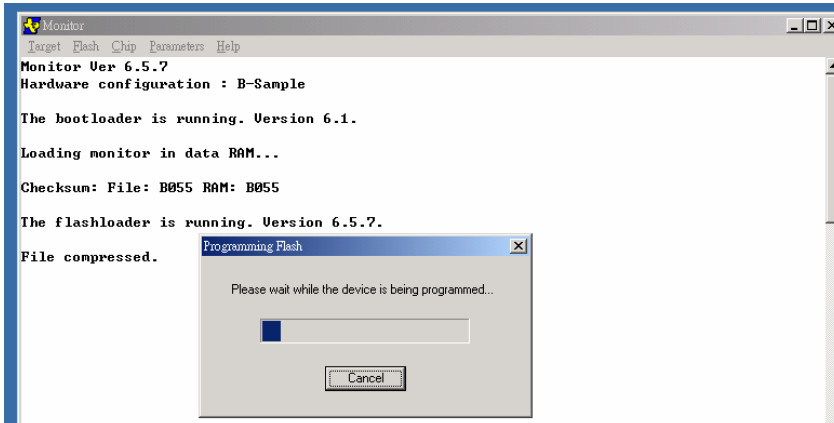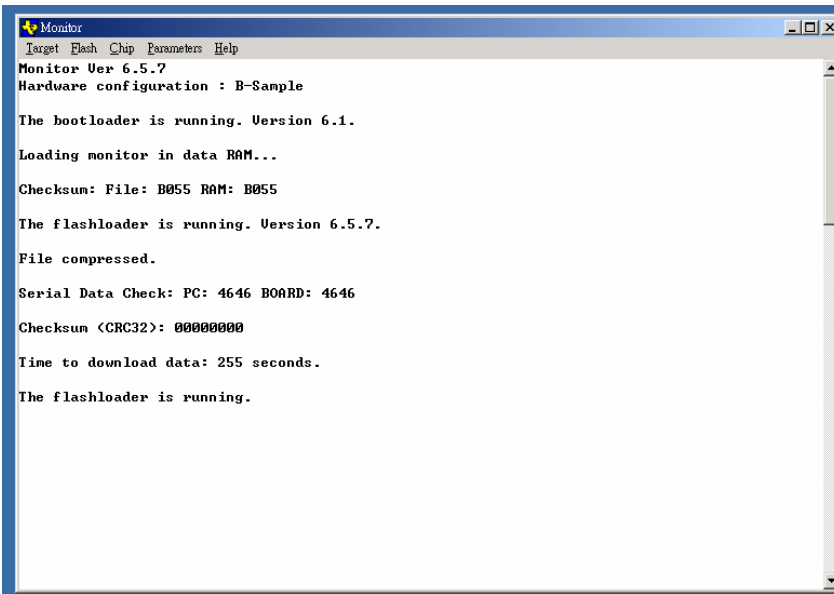5. Tab **Flash** and Select **Erase and Program Appli+Boot**

6. Select **Yes**.

7. Select the corresponding file with **.CP64* extension name. And **Open**.(Enter).

The process begins and wait 5~6 minutes until the following screen appears.

```
Monitor                                                    _ □ ×
Target  Flash  Chip  Parameters  Help
Monitor Ver 6.5.7
Hardware configuration : B-Sample

The bootloader is running. Version 6.1.

Loading monitor in data RAM...

Checksum: File: B055 RAM: B055

The flashloader is running. Version 6.5.7.

File compressed.

Serial Data Check: PC: 4646 BOARD: 4646

Checksum (CRC32): 00000000

Time to download data: 255 seconds.

The flashloader is running.
```

8. Disconnect the unit from the cable and perform a **Full Reset. It is mandatory.**

Important: Go to Checksum Verification on Page 4 to confirm the correct Checksum.

F. GSM Firmware update with 32Mb SD/MM Card

Unlike the Windows CE OS Update, the preparation of SD/MM Card for GSM Firmware Update MUST be done with PC and Device Connected.

1. Set the Unit into Bootloader Mode [While Press & Hold **Power, Reset** the units, wait for GSM OK on display and press **App3** (Contact Key). Message on PDA Screen appears:

FLASH TOOLS	
===============	
CE ROM	TO SD
BOOT	TO SD
CE+BOOT	TO SD
GSM ROM	TO SD
CE+GSM	TO SD

Make sure a 32Mb SD/MM Card is inserted to the Unit and select " GSM ROM   TO SD "   with up/down key and select by pressing Action.
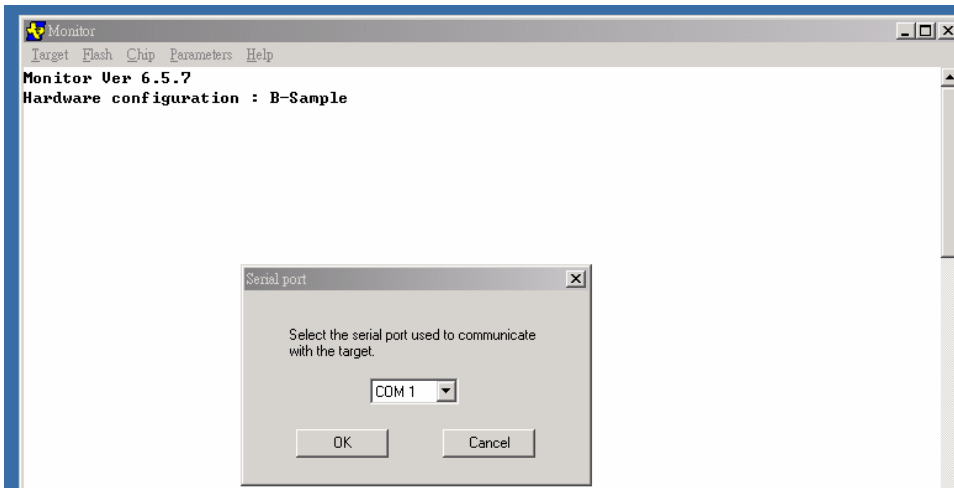
Note. DO NOT SELECT OTHER OPTIONS THAN ABOVE SELECTED. IMPROPER USE OF THIS UTILITY MAY CAUSE DEVICE UNIT FAIL TO BOOT.

2. The following message in on the Pocket PC Phone:

```
      SD      Backup
===============
Please
Connect    rs232
and    run
PC Monitor
Now
```

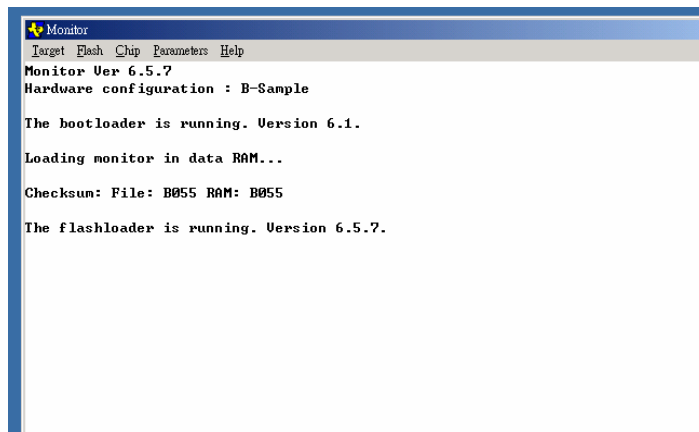3. Connect the Unit to the RS-232 Cable

4. Run Monitor.exe and Select **Target** and **Connect**…The following dialogue box appears:

5. Press OK and the following message on the PDA appears

```
      SD      Backup
===============
PC Monitor
connected
```

Goto *E. GSM Firmware update and continue with Step 5* on page 6 and follow the same procedure to finish the SD/MM Card preparation.

6. Once the process finishes, **Save to SD Success…**appears on PDA screen. Disconnect the unit from the cable and perform a **Full Reset. It is mandatory.**

Important: Go to Checksum Verification on Page 4 to confirm the correct Checksum.

G. Re-Flash GSM FIRMWARE with 32Mb SD/MM CARD

Caution! The unit must have at least 70% of battery capacity before starting the re-flash process. Charge the battery.

1. Insert a SD/MM Card with updated GSM Firmware into the Unit.

2. Set the Unit into Bootloader Mode (While Press & Hold **Power, Reset** the units), the following message appears on the PDA:

```
    SD     Download
===============
CARD TYPE:
CE OS
Press ACTION
to Download
      or
Press REC
To EXIT
```

Press Action to start downloading the image.

CAUTION! *DO NOT REMOVE THE SD/MMCARD DURING THE PROCESS. FAIL TO DO SO MAY CAUSE DEVICE UNIT FAIL TO BOOT.*

```
    SD    Download
===============
     Please Wait
        For
    Downloading


   PRG :005C0000
   END :02000000
    Flash Writing
```

Wait for 5~6 minutes to finish the process.

CAUTION! *DO NOT REMOVE THE SD/MMCARD DURING THE PROCESS. FAIL TO DO SO MAY CAUSE DEVICE UNIT FAIL TO BOOT.*

```
    SD    Download
===============
     Download
     Completed
   CheckSum OK!


   COLD   BOOT
    TO   RESET
```

Download Completed. REMOVE THE SD/MM CARD, AND PUT BACK THE SD FILLER, (If applicable)

Perform a **Full Reset** (COLD BOOT) to complete the process.
It is Mandatory.

## D. Talk Time Clear Procedure (For Refurbishment Only)

System Requirement:

-Windows 98 or above

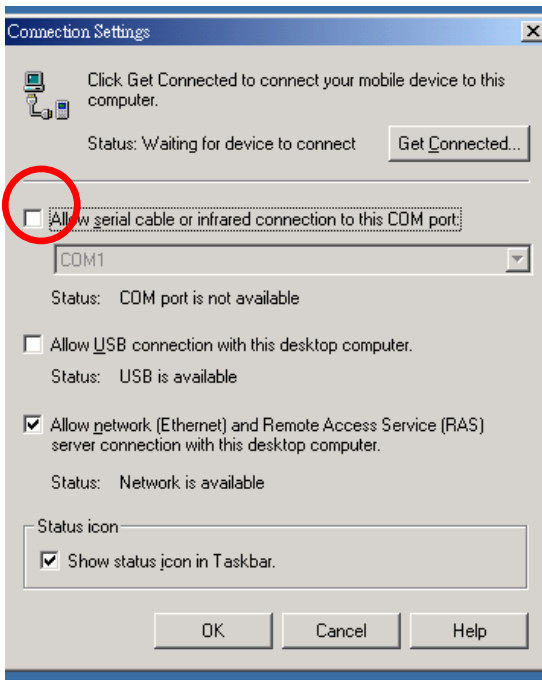-Serial (RS-232) Cable

-MTTY.exe & Image file (to clear Talk Time)

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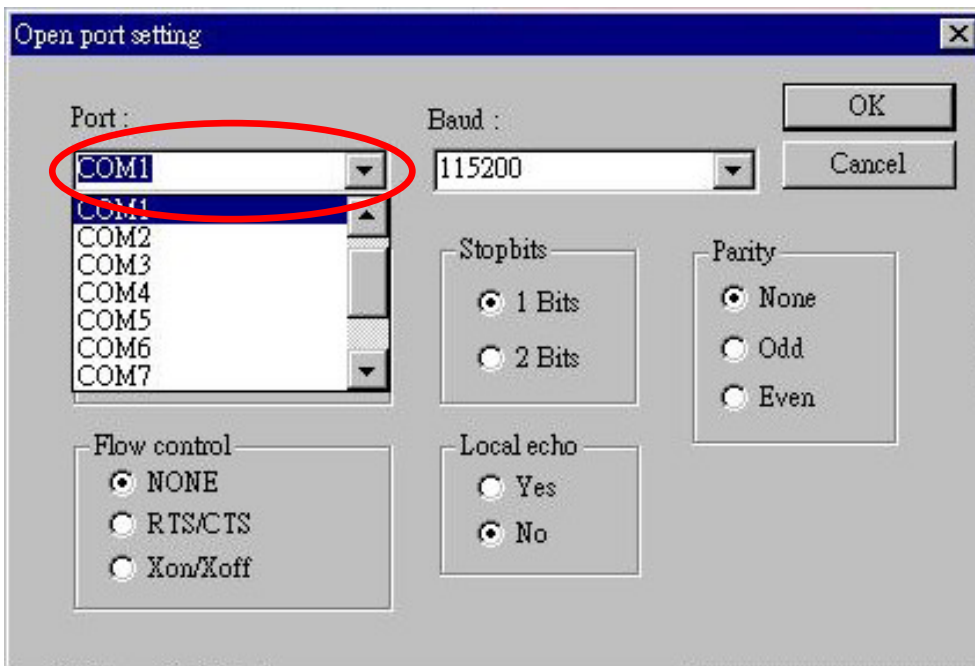
Clear Procedure:

1. Copy the BIN file (ClearTalkTime.bin) to the same folder of MTTY.exe
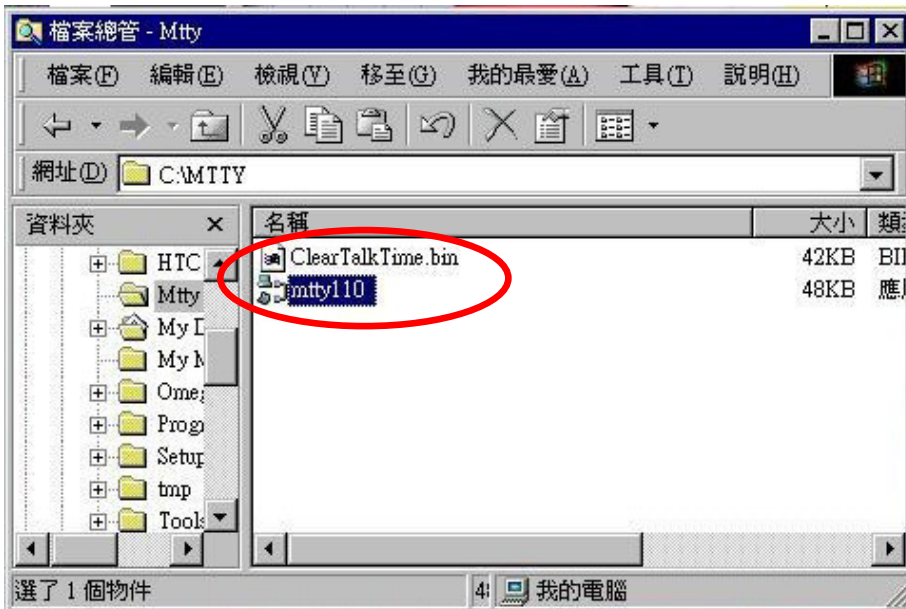


2.Uncheck COM port in Connection Settings in ActiveSync.

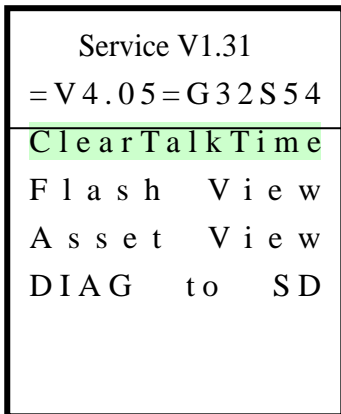3. Run MTTY and select COM1 and leave the status as seen in below picture.

4. Set the Unit into Boot Loader Mode (While Press & Hold **Power, Soft-Reset** buttons on the units).

5. Connect the unit to the PC with Serial cable, then select **OK** on the PC side.

6. On MTTY, type "lr cleartalktime.bin" (**lr is lowercase LR**) then Enter. The program will be downloaded to the unit.
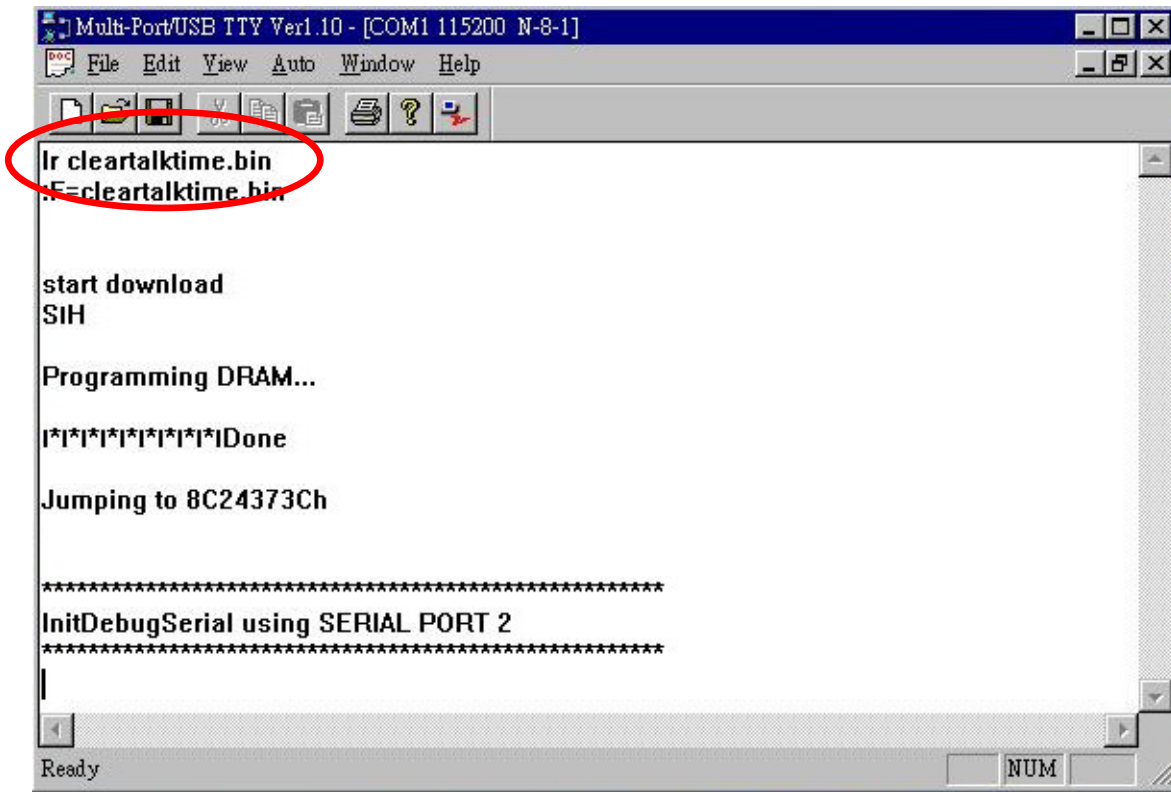
7. The cleartalktime will run automatically on your unit and you will see the follow menu

```
     Service V1.31
 = V 4 . 0 5 = G 3 2 S 5 4
 C l e a r T a l k T i m e
 F l a s h   V i e w
 A s s e t   V i e w
 D I A G   t o   S D
```

7. Highlight the bar to ClearTalkTime and Press Action button. The counter (timer) will be
   cleared.
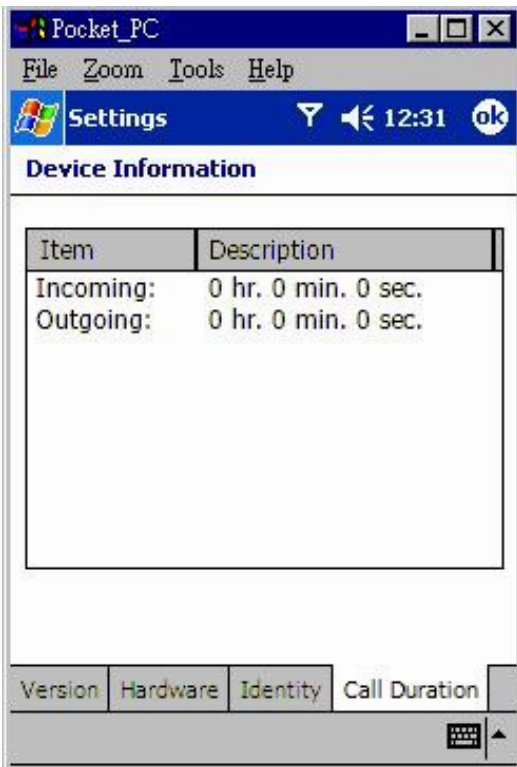
8. Note that you have an option of saving DIAG to SD in the menu, you can load this utility on a SD Card and then use it to clear other units' air timer. Just insert the card and get into Boot loader mode, the program will be loaded automatically.

E. Clear Permanent Save (For Refurbishment Only)

Reason:

If the data of contacts and appointments is stored in flash ROM with permanent save function, it won't be erased by full reset. The data still can be restored with permanent save function.

Please follow the procedure as below to clear permanent save in flash ROM.

Procedure:

1. **Full reset (cold boot).**
2. **Into "settings→system→permanent save→PIM"**
3. **Check "contact and appointments", then tap "OK" to process recover the data from flash ROM. (Figure.1,2)**
4. **Follow step 2.**
5. **Uncheck "contacts and appointments", then tap "OK" to choose "yes". (Figure.3)**
6. **Delete all data in contacts and appointments. (Figure.4)**
7. **Follow step 3.4 to cover the data of contacts and appointments (It means that use blank block to cover the original data in flash ROM).**
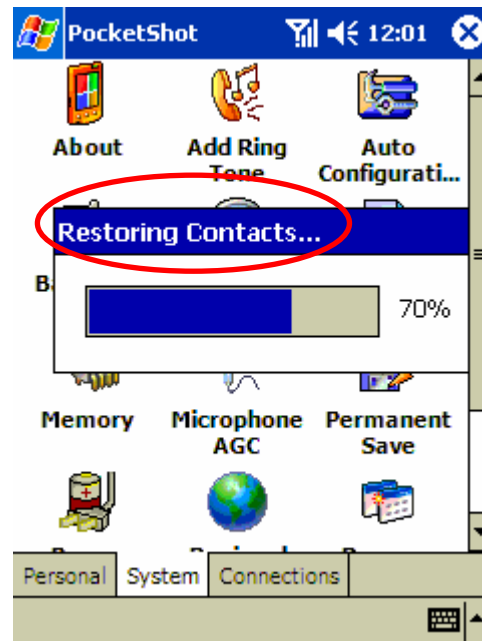8. **Full reset (cold boot).**
9. **Finish the procedure.**
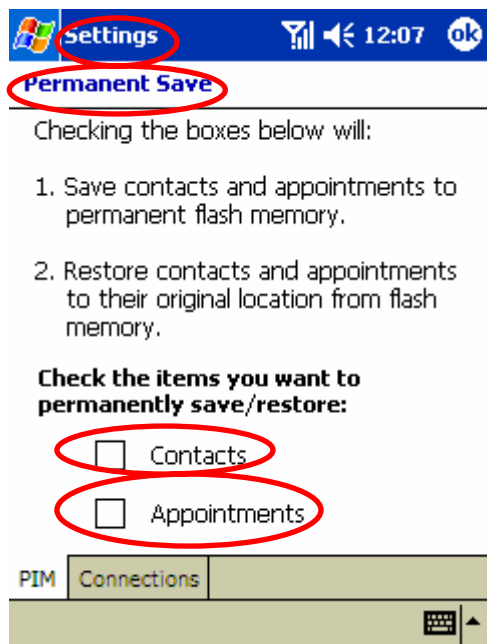

Figure.1

Figure.2

Figure.3
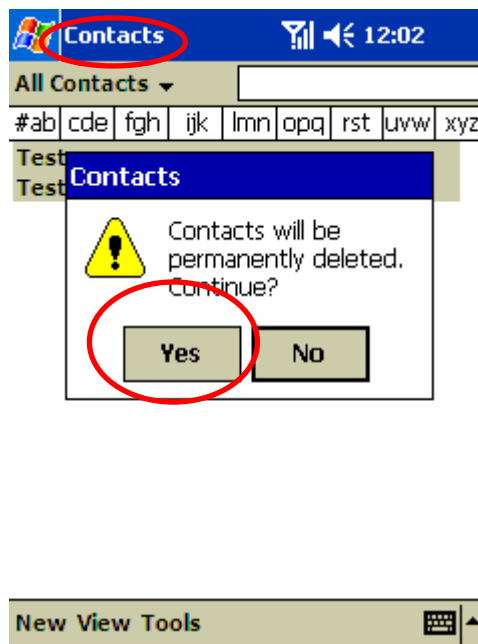
Figure.4

F. Battery rundown testing procedure

Please refer following instruction to complete battery rundown test.

1. It is required to save power detect and model.txt in the same folder under WinCE
2. There is no necessary to adjust power management setting by using rundown test program (power detect ver1.3).
3. Execute power detect under WinCE, then choose 1 hr option, unit will auto fall in
   Sleep mode 1 hr later. Please refer to the illustrated as below:
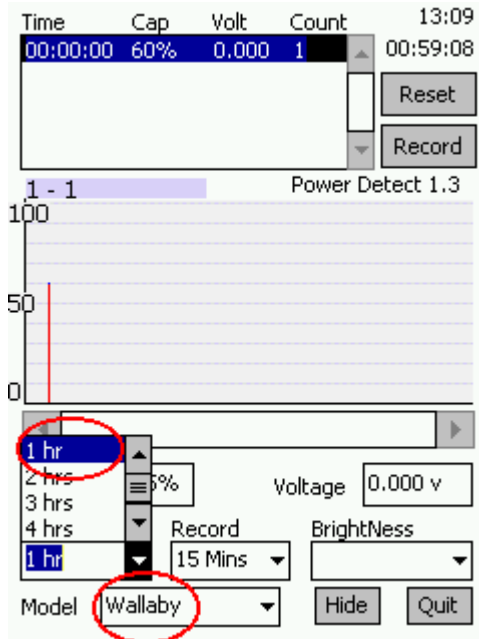
4.Find PowerCap.txt under the same path with power detect program to check the discharge status. The flow chart as below FYI.

5. Battery rundown test flow chart below:

```
          ┌─────────────────────┐
          │  Charge battery to  │
          │ full (at most 4 hrs,│
          │  from 0% to 100%)   │
          └─────────────────────┘
                     │
                     ▼
          ┌─────────────────────┐
          │ Rundown test for 1  │
          │       hour          │
          └─────────────────────┘
                     │
                     ▼
          ┌─────────────────────┐
          │    Rundown test     │
          │    PowerCap.txt     │
          └─────────────────────┘
                     │
                     ▼
                  ╱─────╲
      N      ╱   Capacity>80%   ╲
 ┌─────────╱                     ╲
 │         ╲                     ╱
 │          ╲───────────────────╱
 │                    │ Y
 ▼                    ▼
┌──────────────┐  ┌──────────────┐
│   Replace    │  │     Good     │
│ battery or MB│  │              │
└──────────────┘  └──────────────┘
```