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		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	1 of 71

SkyWriter EVDO

Service Manual



HTC Proprietary
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Rev. **A01**
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TOTAL 71 PAGE NO. 1

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	2 of 71

TITLE: Service Manual for SkyWriter EVDO Pocket PC Phone

REV. NO.	DATE	CONTENTS	DEP.	REVISED	APP'D	STGE.PER.
Ax01	09/30/2008	First Draft	GSD Technical Support	Joy Lu	10/01	DVT
Ax02	12/04/2008	Second Draft, add Ch2. feature sheet and Ch11.2 key component block& update Ch4.3 step6& step11 Update pictures in Ch4.1 Debug fixture, and P/N of Antenna& Antenna cable in Ch10.1.	GSD Technical Support	Joy Lu	12/05	CVT
A01	12/23/2008	Official release, update the Ch8.1 Agency label and Ch5.2& Ch5.3 2577 folder pictures	GSD Technical Support	Joy Lu	12/24	PVT

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TOTAL 71 PAGE NO. 2

 <div>宏達國際電子股份有限公司 HTC Corporation</div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual	Page	3 of 71	

Table of Contents

CHAPTER 1 INTRODUCTION	4
CHAPTER 2 PRODUCT SPECIFICATIONS.....	4
CHAPTER 3 SERVICE EQUIPMENT AND TOOLS	8
CHAPTER 4 ASSEMBLING AND DISASSEMBLING	10
4.1 DEBUG FIXTURE	10
4.2 DISASSEMBLING	11
4.3 ASSEMBLING	21
CHAPTER 5 DIAGNOSTIC PROGRAM.....	35
5.1 HOW TO ENTER BOOT-LOAD MODE	35
5.2 HOW TO MAKE DIAGNOSTIC CARD	36
5.3 HOW TO ENTER DIAGNOSTIC PROGRAM	37
5.4 LIST OF DIAGNOSTIC TEST ITEMS.....	39
5.5 HOW TO PERFORM THE OS UPGRADING PROCESS VIA MICRO-SD CARD.....	40
CHAPTER 6 DEVICE CURRENT CONSUMPTION DATA.....	42
CHAPTER 7 TROUBLE SHOOTING GUIDE	43
7.1 IDENTIFY REPORTED FAILURE SYMPTOM BEFORE REPAIR.....	43
7.2 HOW TO PERFORM WARM BOOT AND COLD BOOT.....	45
7.3 TROUBLE SHOOTING PROCESS/FAULTY TREE	46
CHAPTER 8 LABELING PLAN.....	62
8.1 AGENCY LABEL-	62
CHAPTER 9 LCM INSPECTION CRITERIA (FOR NEW LCM).....	63
CHAPTER 10 SPARE PARTS LIST AND PHOTO	65
10.1 PHOTOS OF SPARE PARTS	65
CHAPTER 11 BOARD LEVEL REPAIR	67
11.1 EQUIPMENT AND HAND TOOLS.....	67
11.2 MAIN BOARD KEY COMPONENT BLOCK:	68
NOTIFICATION ONCE PERFORMING GOLDEN CAP REPLACEMENT	71

 宏達國際電子股份有限公司 HTC Corporation		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	4 of 71

Chapter 1 Introduction

This manual provides the technical information to support the service activities of **SkyWriter EVDO Pocket PC Phone**. It contains highly confidential information, so any or all of this document should not be revealed to any third party.

Chapter 2 Product Specifications

Feature	Description
OS Release	Crossbow 6.1 AKU 1.4
Dimensions and ID	ID intent is to create an update design with a flush front surface.
Processor and Baseband	Qualcomm Dual-Core MSM7501A at 528MHz
RF	RTR6500
Memory	NAND Flash Storage – 512MB DDR SDRAM –128MB
Power (Talk and Standby time)	Talk Time: 5 hours typical Standby: > 350 hours with partial refresh enabled (partial refresh to be controlled by Polish customization) Carrier targets must be achieved: Vodafone, AT&T, Orange
Antenna	Internal antenna design, with Diversity support for cellular and PCS bands. AGPS antenna to support MS-based and MS assisted. Co-existence between WI-FI and Bluetooth must be optimized. Must meet Palm Engineering specifications for RF performance. <ul style="list-style-type: none"> • Desense when using Wi-Fi, Bluetooth, GPS • Head/Hand effect • Desense with support peripherals (e.g. extended battery if available) • Desense in all audio modes. • Desense when other functions are in use (e.g. camera) • Satisfy HAC for CDMA (North America)

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Doc. No.

DOC-00048034

REV.

Issued Date

2008/10/08

Revised Date

2008/12/23

A01

Doc. Title

SkyWriter EVDO Service Manual

Page

5 of 71

Display / Controller	<p>TFT, 320x320 display.</p> <p>Supports displaying 16 bits (+65,536) of colors out of a palette of 256,000 colors.</p> <p>Partial refresh will be supported.</p>
Wi-Fi Radio	<p>802.11 b/g (TI chipset)</p> <p>Co-existence of WLAN data with BT hands-free call or A2DP streaming is required.</p>
IR	Supported.
Bluetooth Radio	<p>BT 2.0 + EDR. TI chipset.</p> <p>Co-existence with WLAN data during hands-free call or A2DP streaming is required.</p>
LED	Red and Green Led's will be required on the left hand corner of the front plastics. The LED must be visible in bright daylight.
Connector	Micro-USB, All audio routed to 3.5mm
Camera	2MP FF camera, Flash not supported
Stylus	Stylus included
Hardware buttons	<ul style="list-style-type: none"> • Five-way navigation button • The application buttons will be backlit • 2 soft keys for Windows Mobile platforms (Soft keys are onscreen only. No graphic to show any active area below touch window.) • Dedicated Power Button • Dedicated Send and End keys • 4 application buttons (2 application buttons, OK, and Start Key) • Ringer silence switch • Wi-Fi push button • Volume control – the two buttons appear on the left- side of the device to control volume <p>Side center Button: Voice Dialing/PTT (if applications based solution implemented)/MP3 Button</p>
Expansion	<p>MicroSD</p> <p>SDHC and class 6 compatible</p> <p>Max capacity: 32GB SDHC</p>

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TOTAL 71 PAGE NO. 5

 <div>宏達國際電子股份有限公司 HTC Corporation</div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual	Page	6 of 71	

Battery	<ul style="list-style-type: none"> • Rechargeable 1500 mAh, Li-ion (Standard battery considered high capacity by CDMA carriers.) • Removable Battery • Charging through USB port should not to exceed 500mA, however, the USB cable is rated for 1A charging as it is used to connect to the power adapter • Heavy User Scenario: Charging limited to 50C for battery safety concerns. Note: <i>Battery pack may be raised by vendor to 50C.</i> • Charge time will be < 3.5 hours • Heavy user scenarios must be met with the standard battery to prevent the need of an Extended Life Battery.
Audio	<p>Audio experience based on the following priorities:</p> <ul style="list-style-type: none"> • Exceptional voice quality. First priority is a great experience of using the receiver against your ear. Receiver must pass Palm's audio spec. Ergonomics of the earpiece are critical – for example, provide a targetable and comfortable landing area of your ear. • Second larger speaker for the application of speakerphone, audio/video playback (MP3), and loud ringtone playback. The speakerphone (off the back of the device) must be clear and audible even when the device is placed on a table with the screen facing up. • >32 polyphonic MIDI support (SW) required for ringtones and system sounds. • Two-speaker architecture single receiver (front facing) optimized for voice and one speaker (rear facing) for loud system sounds and speakerphone mode. The speaker cavity must be designed to minimize the audio leaks and maximize the space necessary to provide a rich audio experience (benchmark the products against Moto Q and Nokia E61/62). • Microphone support from the built-in mic and headset. Improve the design and placement so that the ambient noise is reduced while the user's voice is clear at the receiver's end. • Headset 3.5mm interface (refer to later section on pinout) <p>Bluetooth Handsfree call management with SCO and eSCO headsets, and stereo media with wireless stereo A2DP headsets. The requirements for range and clarity (listed in the performance section in the Bluetooth FRD) must be met in stand-alone mode, and with simultaneous data traffic on cellular network (for UMTS networks) or Wi-Fi. The</p>

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		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	7 of 71

	simultaneous data must not impact the range and/or clarity of the voice call on BT handsfree.
Keyboard	Skywriter keyboard usability is critical for messaging centric business customers. QWERTY required. Keyboard will be LED backlit.
Real Time Clock	The real time clock must be included to meet a Microsoft LTK requirement.

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TOTAL 71 PAGE NO. 7

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	8 of 71






Chapter 3 Service Equipment and Tools

Please refer service tools list for detail.

No.	Test for	Setup for	Detail tools/ equipment	Photo
1	Soldering tools	Component level	Lead-free Soldering station	
2	General tools list	System level	Disassembly/assembly tools	
			USB Cable	
			Headset	
			AC Adapter	
			Micro SD Card	
			PC + monitor	
			Label Printer	

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TOTAL 71 PAGE NO. 8

3	Handset Current consumption	System level	Power supply	
			Current series jig	
4	Battery	Component level	Voltage meter	
5	All functions	Board level	Manual test fixture	
			Control box	

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		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	10 of 71

Chapter 4 Assembling and Disassembling

4.1 Debug fixture

Reference pictures	Purpose	Lead time (day)
	Function test fixture	14
	Control box	14

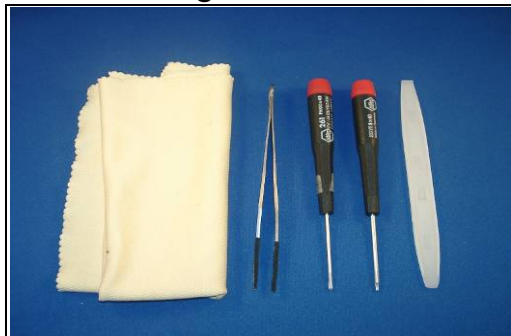
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TOTAL 71 PAGE NO. 10

Doc. No.	DOC-00048034		REV.
	Issued Date	2008/10/08	A01
	Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page 11 of 71

4.2 Disassembling



Tools requirement for Assembling and Disassembling the PDA Phone

1. Lens Cleaning Tissue.
2. Tweezers (plastic head)
3. Philip Screw Driver PH00.
4. Torex Screw Driver T5
5. Special Made Plastic Stick.



Disassembly Process:

Follow the arrow direction to remove the battery cover.



Remove stylus



From the hook remove the battery.

⚠ 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.

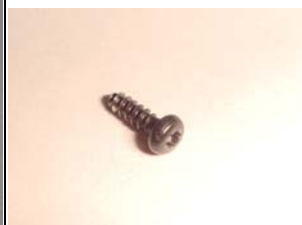




Remove the battery by following the direction of the arrow.



Unfasten four screws.
(They are the longer ones.)



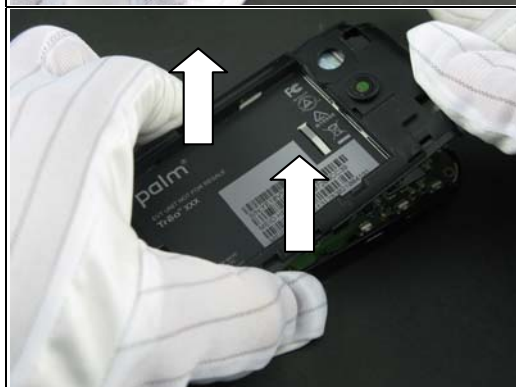
Unfasten one shorter screw.
(at the middle edge of the housing location)



From upper side of the unit (Antenna cover)
remove the antenna cover.



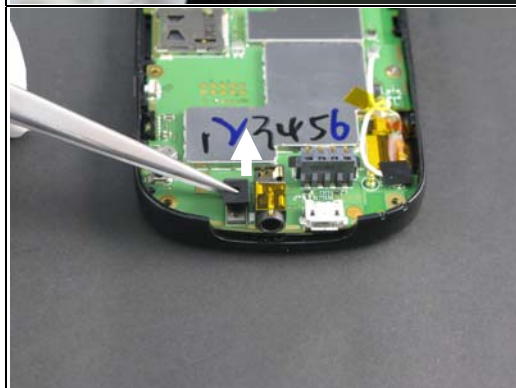
From left upper side of unit, use plastic stick tool to release the hooks to remove the housing.



Pull the front part of housing upward to separate the frame from the bezel.



Turn the housing counterclockwise to separate the frame from the bezel.



Remove the microphone rubber from main board.

Doc. No.	DOC-00048034	REV.
Issued Date	2008/10/08	A01
Revised Date	2008/12/23	
Page	14 of 71	

Doc. Title	SkyWriter EVDO Service Manual
------------	--------------------------------------



Use tweezers to remove the black tape



Use tweezers to remove the antenna cable from lower antenna connector.



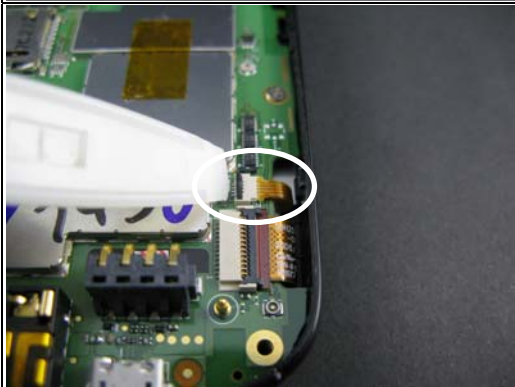
Use tweezers to remove the antenna cable from the upper connector.



Remove the tape on Keypad and Touch window FPC connector.



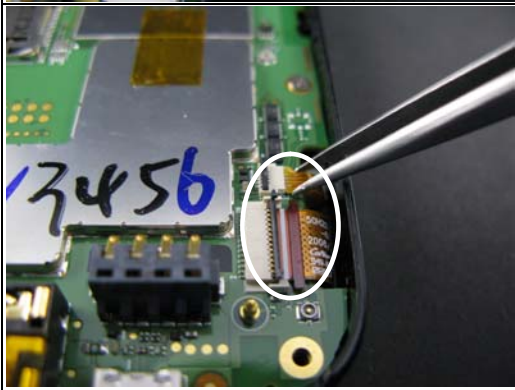
Leave the yellow tape in the white circle area to prevent from forgetting to put it back (if you plan to reuse the kapton tape.)



Use plastic stick to unhook the Keypad FPC connector.



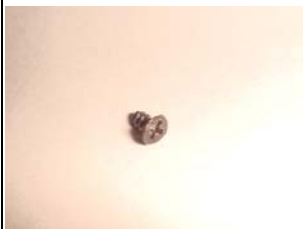
Use plastic stick to unhook the Touch window FPC connector.



Pull the FPCs out of both connectors.
(Note: Don't damage or prick the FPCs.)



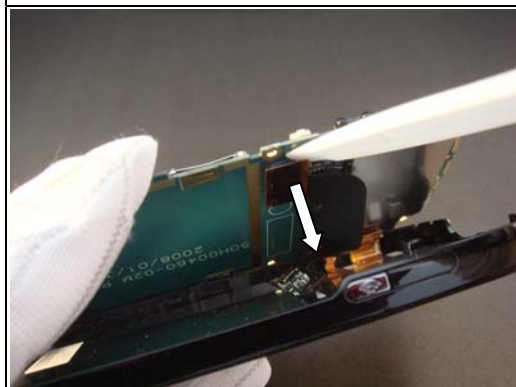
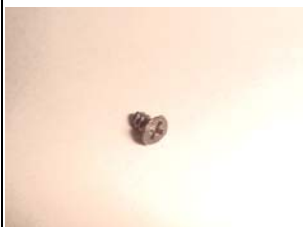
Unfasten three screws on the PCBA. (Positions of them please refer to the white circles.)



Unfasten three screws on the PCBA. (Positions of them please refer to the white circles.)



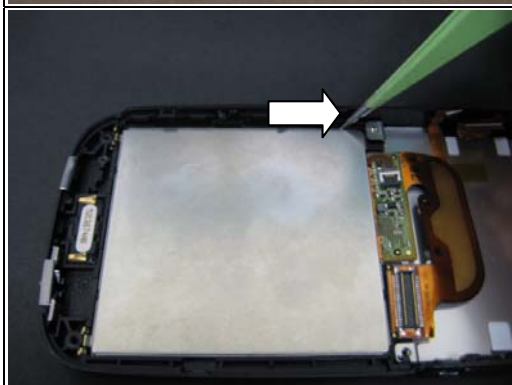
Unfasten three screws on the PCBA. (Positions of them please refer to the white circles.)



Lift the PCBA up and use the plastic stick to unlock the LCM connector.
(Carry out this action before the PCBA is levered too far from the LCM.)



Divide the front bezel+LCM and the PCBA.

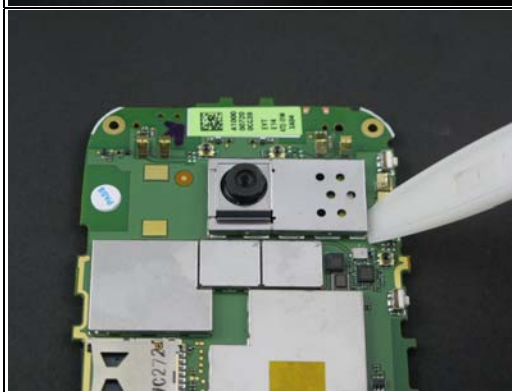


Use tweezers to remove LCM from Bezel.



Pull one side up only and then take out all LCM from Bezel.

(Don't scratch the touch panel in anyway.)



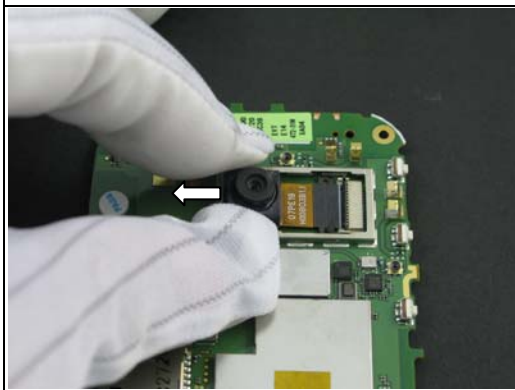
Use plastic stick to remove camera shielding cover.



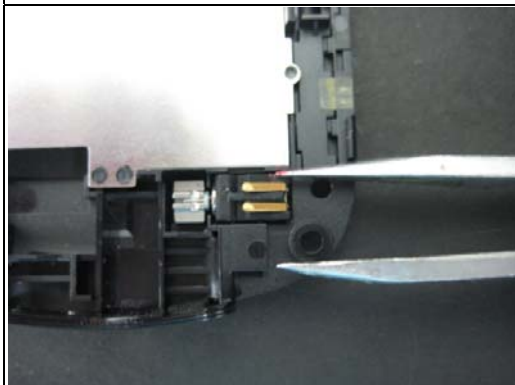
Use tweezers to remove the kapton tape on the camera FPC connector.



Use plastic stick to unlock the FPC connector.



Remove camera module from main board.



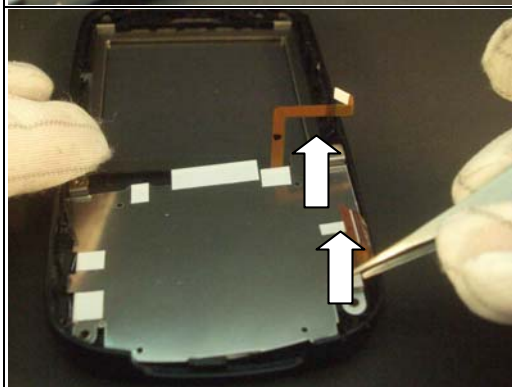
Use tweezers to remove the vibrator on the housing.



Use tweezers to remove the loudspeaker on the housing.



Use tweezers to take the receiver out.



Remove the keypad FPC on the bezel.
Step1. move the right side of keypad FPC upwards.



Step2. move the left side of keypad FPC out of the bezel.



Remove keypad from the Bezel.



Remove AP key from the Bezel.

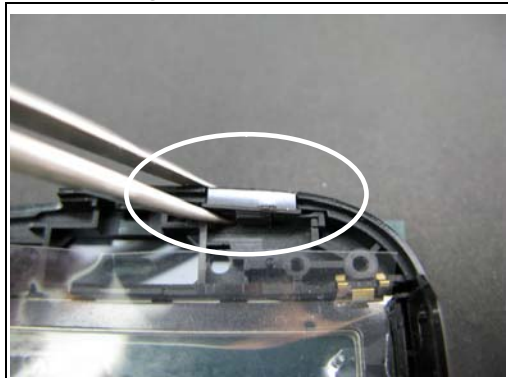


Take out the keypad frame from the Bezel.
(1. right side 2. left side, 3. down side, 4. upper side)

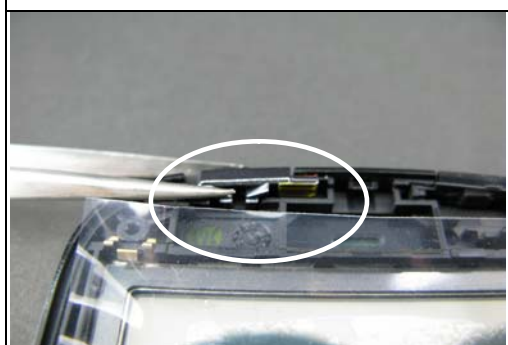


The disassembling is done.

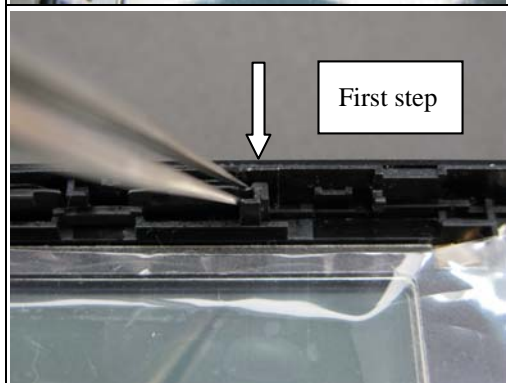
4.3 Assembling



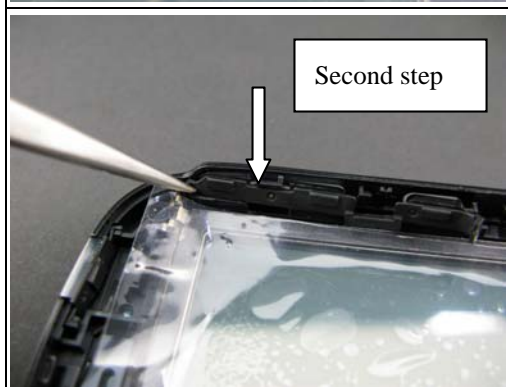
Put 4 buttons into the Bezel.
Power button



Mute button



Volume+ Camera button(First step: Insert the lower part.)



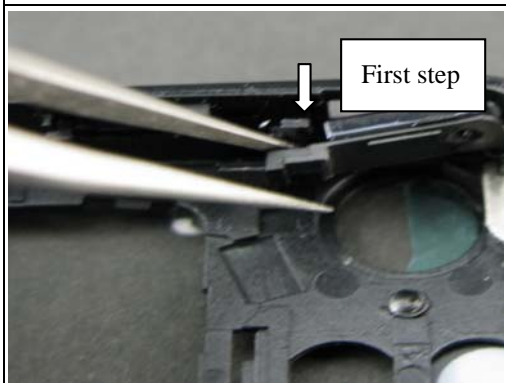
Volume+ Camera button(Second step: Insert the upper part.)



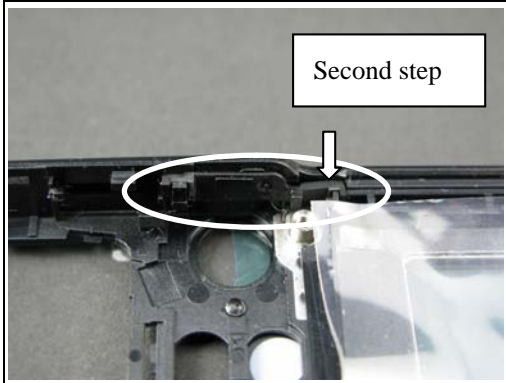
Volume+ Camera button(Complete picture)



Stick one Mylar in the pointed area.



Wi-Fi button (First step: Insert the lower part.)



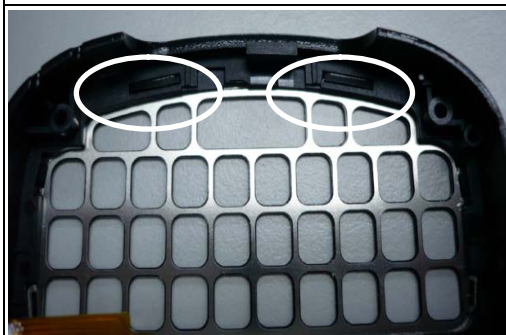
Wi-Fi button (Second step: Insert the upper part.)



Assemble the keypad frame on the Bezel.
(1. Upper side, 2. down side, 3. left side, 4. right side.)



Put two spacers on the two bottom hooks of the Bezel.



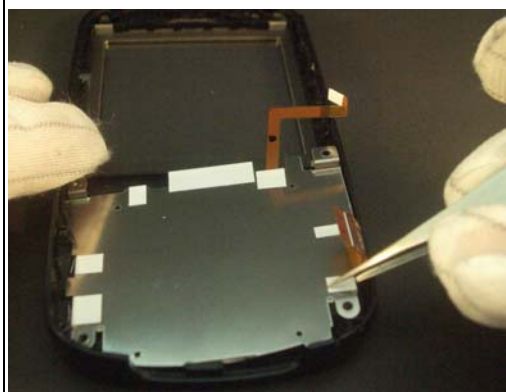
Put two spacers on the two bottom hooks of the Bezel.



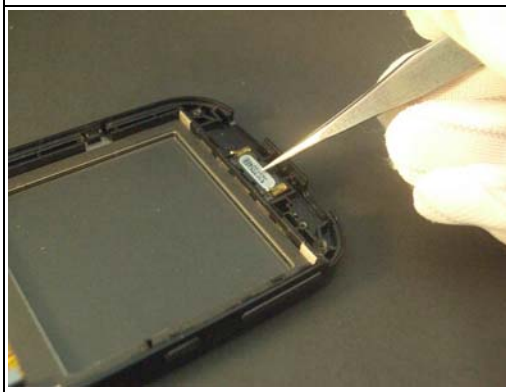
Lift the touch window FPC to insert the AP key into the Bezel. (Green key is on the right side facing you.)



Put keypad into the Bezel

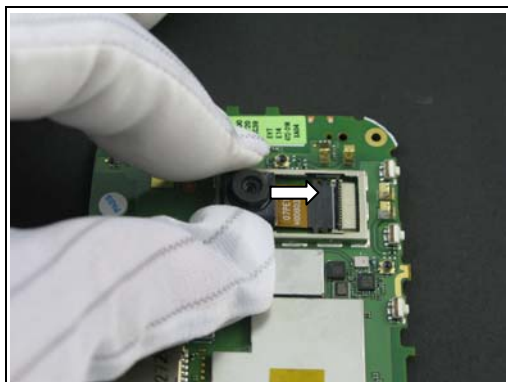


Assemble keypad FPC on the Bezel. (1. insert left upper hook, 2. insert right upper hook, 3. insert left down hook, 4. insert right down hook)

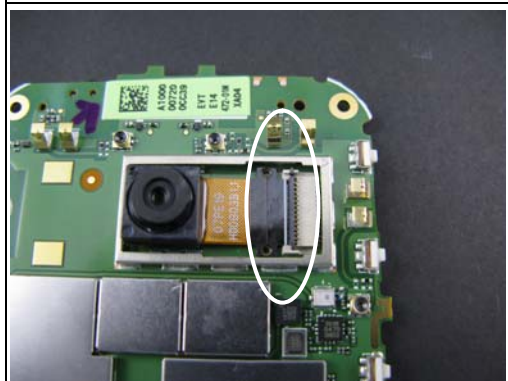


Assemble the receiver on the Bezel. (**Attention:** two springs must be downward.)

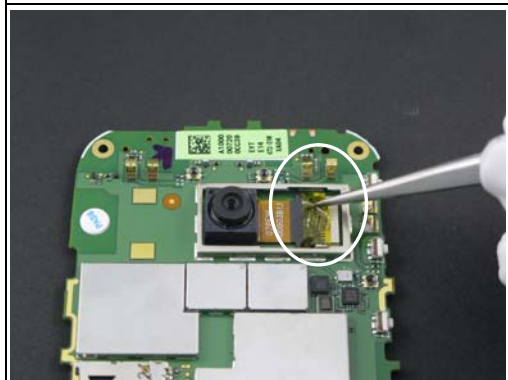




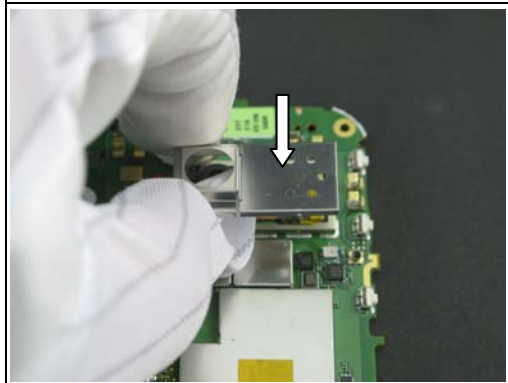
Assemble camera FPC into camera socket.
(Attention: Insert FPC to the end, and the white line on FPC should be reached the edge of the switch to make sure your camera assembled correctly.)



Insert FPC to the end, and the white line on FPC should be reached the edge of the switch to make sure your camera assembled correctly.



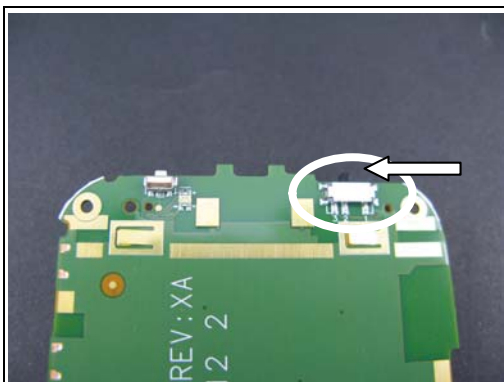
Close the FPC socket and stick the kapton tape on the FPC connector.



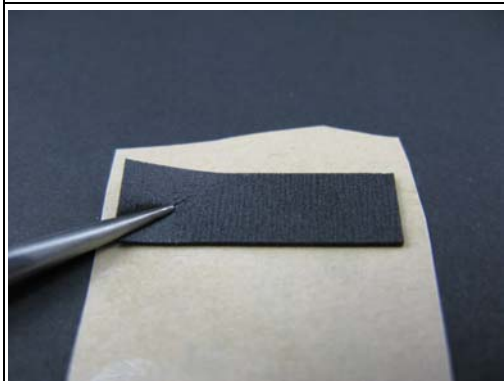
Close the camera shielding case on the shielding frame.
(Attention: Make sure the camera is seated correctly in the shielding case to prevent damaging the camera module)

Doc. No.	DOC-00048034	REV.
Issued Date	2008/10/08	A01
Revised Date	2008/12/23	
Page	26 of 71	

Doc. Title **SkyWriter EVDO Service Manual**



Make sure the mute button push to the left side.
(Purpose: To prevent damaging the switch by assembling process.)



Stick one poron on the LCM FPC.



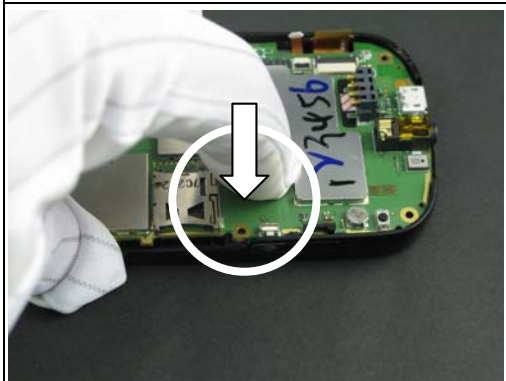
Stick one poron on the LCM FPC.



Put LCD module in the Bezel.
(Top side first, and don't scratch the Touch Panel.)



Put the PCBA into the Bezel+ LCM assembly.
(Right side first.)



Use point finger to press down the PCBA in the area of the white circle.



Lift the PCBA and use fingers to make sure the connection between PCBA and LCM is good.


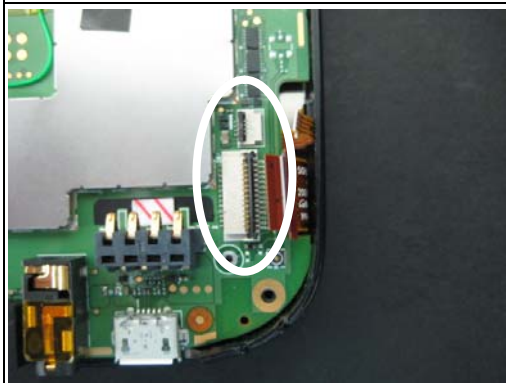


Fasten two screws on the marked positions by white circles.(Torque: 0.3±0.05kgf-cm)





Fasten the last one screws on the marked positions by white circles. (Torque: 0.4±0.05kgf-cm)

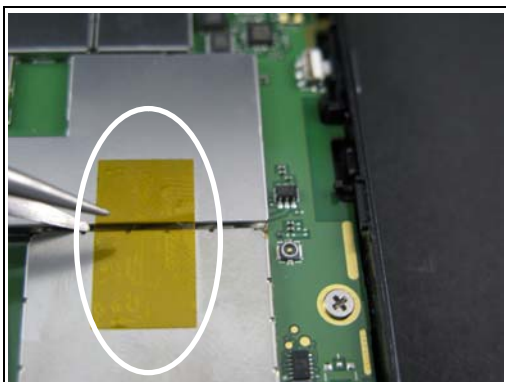
Open Touch window FPC connector and the keypad FPC connector.



Insert Keypad FPC into connector, and make sure the Keypad FPC is located in the right position.



Insert touch window FPC into connector, and then close these two connectors.



Use tweezers to lift the kapton tape up.



Stick the kapton tape on the FPC connector.



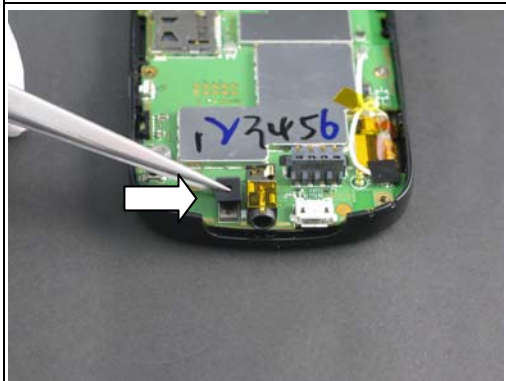
Use tweezers to combine the second antenna cable with the upper antenna connector.



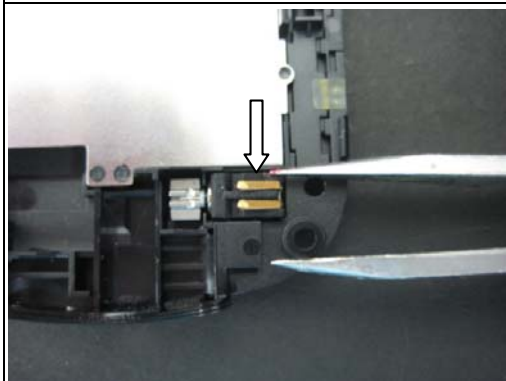
Use tweezers to combine the second antenna cable with the lower antenna connector.



Use tweezers to stick the black cable on the second antenna cable.



Place Microphone rubber on microphone.
(The position of microphone, please refer to the pointing arrow.)
Microphone rubber P/N: 76H02481-00M



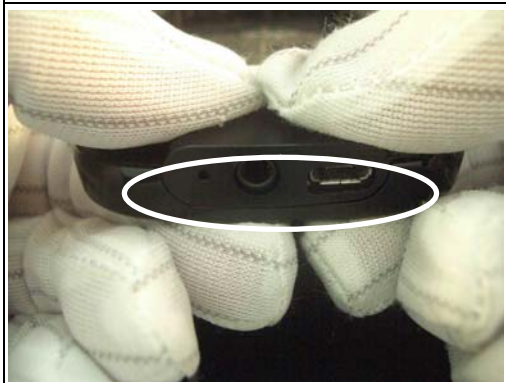
Put the vibrator into the housing.



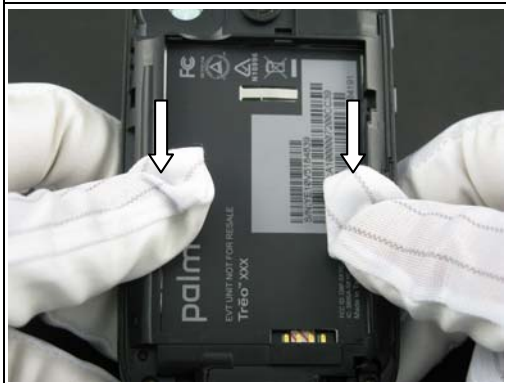
Put the speaker into the housing.



Assemble the housing on the Bezel.
Step1. insert the down hook of audio jack,



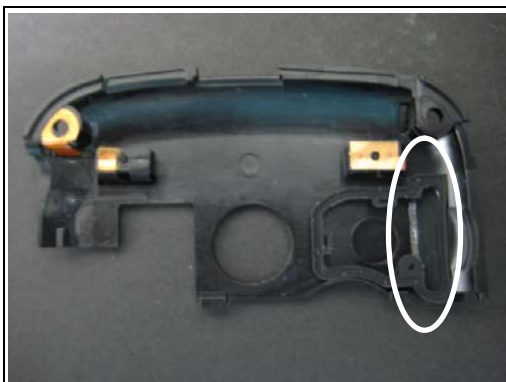
Step 2. Press down the bottom of the housing to close the hook between the housing and Bezel.



Step3. Press down the middle part of the housing.



Step4. Press down the upper part of the housing.



Before assembling the antenna, please make sure the rubber gasket is not deformed, especially on the right edge.



Assemble the antenna cover into the housing.
Step1. Insert the lower hook of the cover into the housing.



Step2. Put the upper side of the antenna cover down on the housing.

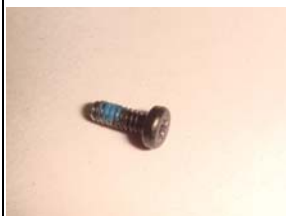


Fasten 4 longer screws into 4 corners.
(Torque: 0.8±0.05kgf-cm)





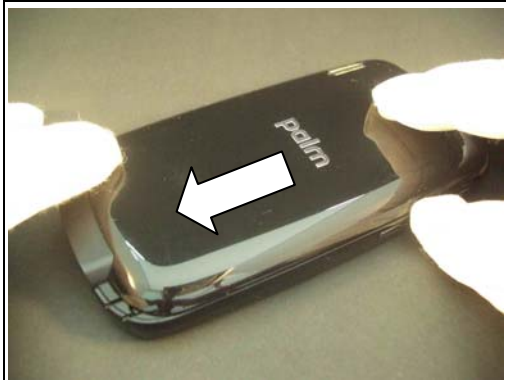
Fasten 1 shorter screw into the middle screw holes. (Torque: 0.8±0.05kgf-cm)



Place battery into the housing.



Insert stylus into the unit



Place battery cover into the unit.



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Doc. No.

DOC-00048034

REV.

Issued Date

2008/10/08

Revised Date

2008/12/23

A01

Doc. Title

SkyWriter EVDO Service Manual

Page

34 of 71



The assembling is done.

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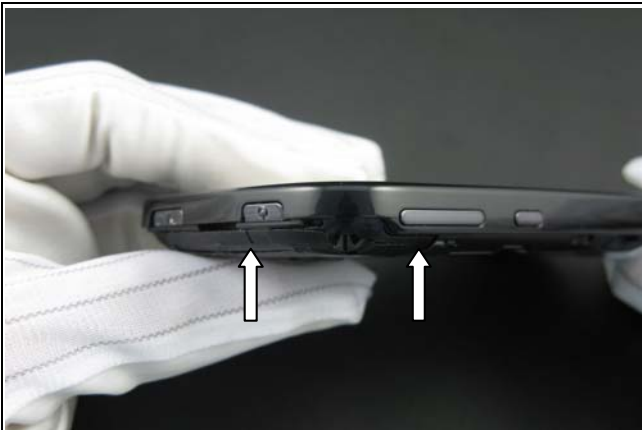
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TOTAL 71 PAGE NO. 34

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	35 of 71

Chapter 5 Diagnostic Program

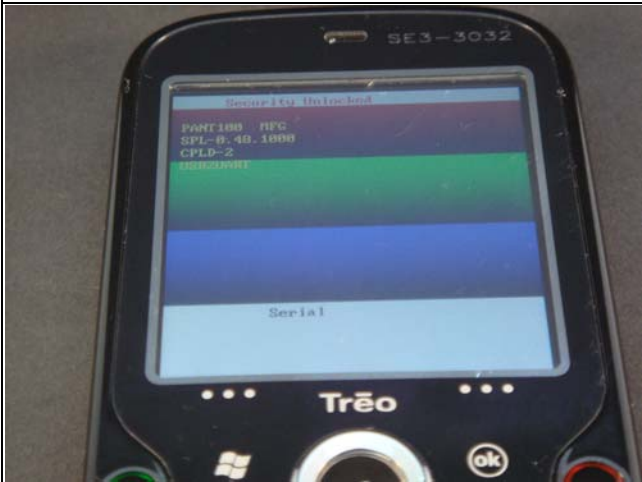
5.1 How to enter Boot-load mode



1. Press Power on and Volume up button, in the same time.




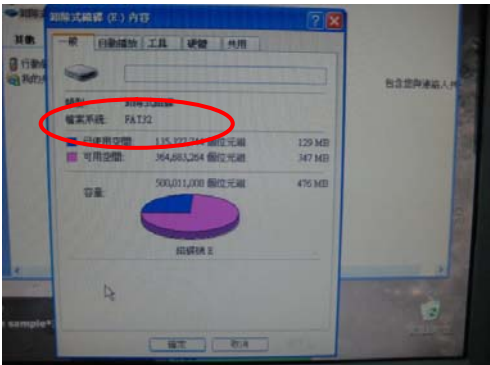

2. And then install battery into the device.



3. Enter Boot-loader mode


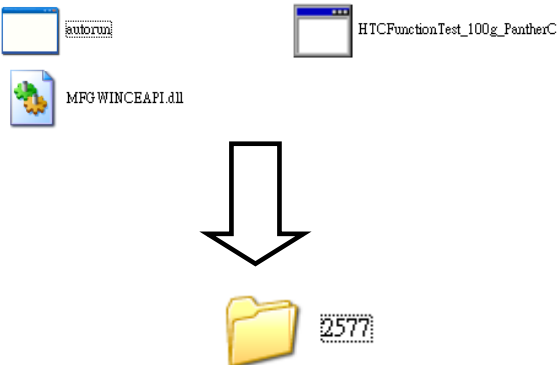

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	36 of 71

5.2 How to make Diagnostic card

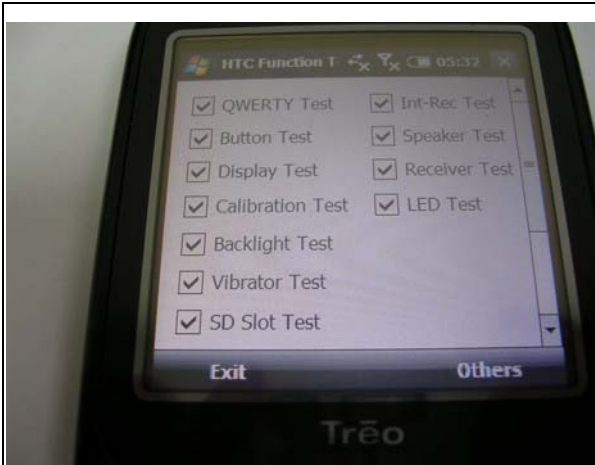
	1. Prepare one micro SD card.(>128MB)
	2. Format it with FAT 32.
	3. Copy these three function test items into 2577 folder in micro SD card.

 <div>宏達國際電子股份有限公司 HTC Corporation</div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual	Page	37 of 71	

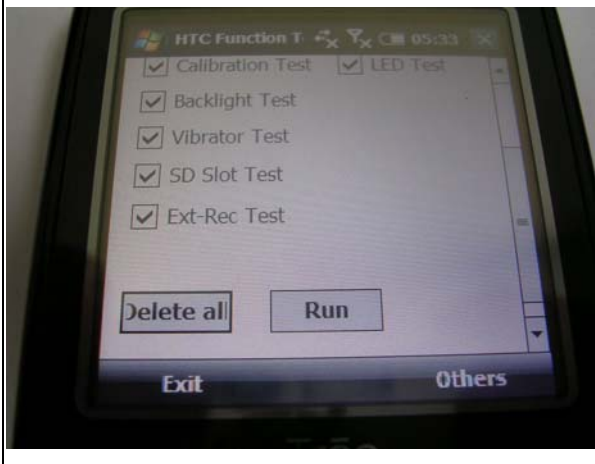
5.3 How to enter Diagnostic Program

	1. Power on the handset into OS mode.
	2. Create the folder, "2577", in the Micro SD card, and copy the WinCE diagnostic program into Micro SD card.
	3. Insert the Micro SD card into the device then the program will execute automatically.

 <div>宏達國際電子股份有限公司 HTC Corporation</div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual	Page	38 of 71	



4. 1 Test items (Detail descriptions of the test items please refer to the Chapter 5.4 List of diagnostic test Items)



4.2 Test items (Detail descriptions of the test items please refer to the Chapter 5.4 List of diagnostic test Items)

 宏達國際電子股份有限公司 HTC Corporation		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	39 of 71


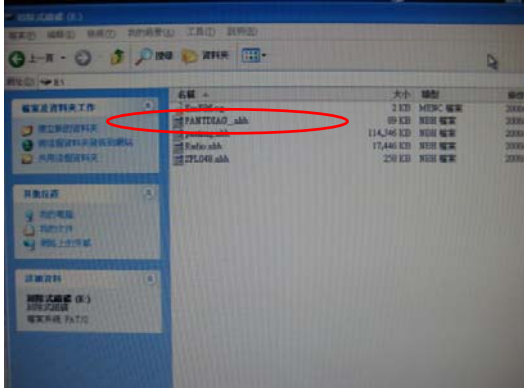

5.4 List of diagnostic test Items

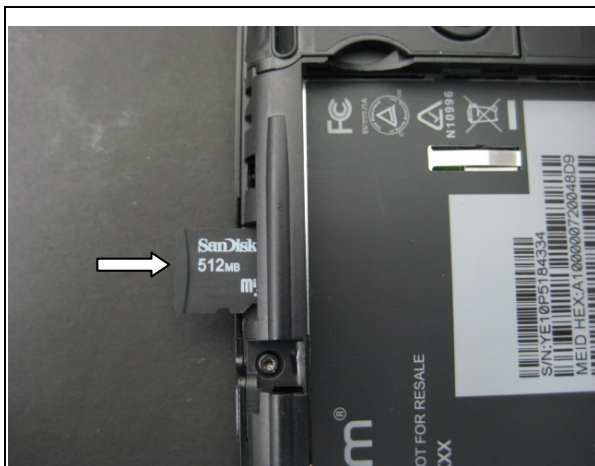
No.	Item	Description	Remark
	Function Test	All manual function test item by item	
A	QWERTY Test	QWERTY keys	
B	Button Test	Send key/Calendar key/Windows/ Left/ Up/ Right/ Down/ Action key/ Messaging/ OK/ End/ Camera/ Vol_Up/ Vol_Down/ WIFI/ Mute/ Unmute	
C	Display Test	LCD pattern display test. Red – Green – Blue – Black/White chequered chess board 7*7 – Grey scale	
D	Calibration Test	Touch panel calibration test.	
E	Backlight Test	LCM back light level Off, 1~4	
F	Vibrator Test	Vibrator on test	
G	SD Slot Test	SD card read/ write/ compare test	
H	Ext-Rec Test	Record from headset and play to earphone.	Microsoft built-in "Busy sound"
I	Int-Rec Test	Record from internal MIC and play to speaker.	
J	Speaker Test	Speaker test	
K	Receiver Test	Receiver test	
L	LED Test	AMBER Blink/ QKey on/ RED On/ RED Blink/ GREEN On/ GREEN Blink	

The following items need to be tested by manual function test			
No.	Item	Description	Remark
1	USB TEST	Linking with PC/Notebook to check USB Linking function	USB TEST
2	SIR Test	Infrared port test, Link with PC/Notebook to check IR Link function	SIR Test
3	Camera	Camera viewing test	Camera
4	Bluetooth	Bluetooth communication test	Bluetooth
5	Wi-Fi	Wireless LAN test	Wi-Fi
6	GPS	Global Positioning System test	GPS

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5.5 How to perform the OS upgrading process via Micro-SD card

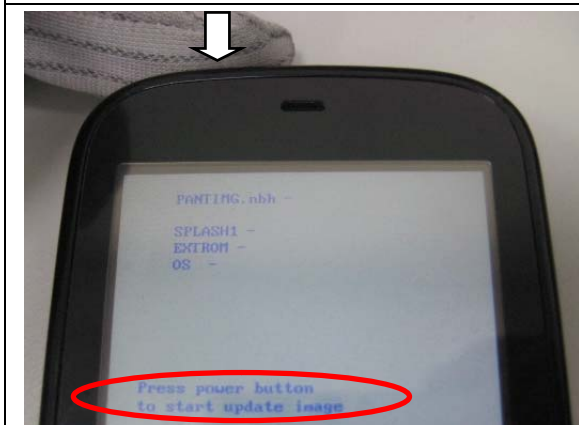
	<p>1. Formatting the micro-SD card with FAT32 format.</p>
	<p>2. Changing the file name from OS090.nbh to pantimg.nbh</p>
	<p>3. Saving the pantimg.nbh into micro-SD card.</p>



4. Inserting the micro-SD card.



5. Making the handset into boot loader mode by pressing power and volume up button.



6. Pressing power button to activate the re-flash procedure.

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	42 of 71

Chapter 6 Device current consumption data

Charge current	Conditions
40mA < Ib < 55mA	Pre-charge current set at $V_b < (3.0 + 0.2V)$
0.4A < Ib < 0.5A	USB host is detected and configured.
0.8A < Ib < 1.0A	When charger is under software control, and AC adapter is plugged in.
Ib is the charge current pass through the charger (PAU3). Vb is the main battery voltage.	

Current value	Type of Mode
0.01~0.04A	Sleep mode (Press power on key)
0.06~0.12A	Flight mode (Flight mode on, LCM, Keypad light on)
0.08~0.15A	Wake up mode (Phone on, LCM, Keypad light on)
0.8A~1.0A	Charging mode (Main battery capacity < 40%)

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TOTAL 71 PAGE NO. 42

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	43 of 71

Chapter 7 Trouble Shooting Guide

7.1 Identify reported failure symptom before repair

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 TBD°C and above TBD°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 Micro SD Memory Card	Card is not being pre-formatted.
		Micro SD card has been switched to Write Protect mode.
		Card is not inserted completely or bad contact between connector contacts.

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 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	44 of 71

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, RF function; No sound or volume is low.	When Battery low, the music playback and RF function 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 file 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 file being used is fragmented.
14	Wireless connection (WLAN/BT) not functioning	Make sure the wireless environment is OK before connecting to WLAN.
		*Note: Nevertheless, the above symptoms could be solved by a software reset or hardware reset, make sure the Warm /Cold boot has been executed and try to reproduce the symptom reported.

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TOTAL 71 PAGE NO. 44

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	45 of 71

7.2 How to perform Warm Boot and Cold Boot

Soft Boot: Reset the unit by pressing reset button.

Hard reset process:

1. Press the end button and then insert the battery. (Hold your finger on the end button for about 5 seconds after you inserting the battery or by pressing the reset button.)



2. The device will display the following picture and then tap upper of navigation button to erase all data. After tapping upper button of the navigation key, the handset will reboot by itself.



 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	46 of 71

7.3 Trouble shooting process/Faulty tree

7.3.1 Power / Battery **

Problem Area	Items to Check	Repair Action	Remark
No Power On/Can't boot	Exclude software issue.	<ul style="list-style-type: none"> Try to hard reset the unit and try again. 	
	Check if the battery is official battery or not.	<ul style="list-style-type: none"> If not— Replace battery. 	
	Use voltage meter to check if the battery voltage is too low.	<ul style="list-style-type: none"> If voltage is under 3.8V, insert charger to handset. 	
	Visually inspect the contact pads of Battery	<ul style="list-style-type: none"> If dirty or oxidized – Clean pads If damaged – Replace Battery 	
	Visually inspect Battery Connector	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged –Use hot air to change it. 	
	Check the power on key works normally or not.	<ul style="list-style-type: none"> If dirty – Clean If damaged – Replace power on switch. 	
	Check all connectors including LCD FPC to Main Board.	<ul style="list-style-type: none"> If the connection status is not good, assemble the Unit again. 	
	Software re-download.	<ul style="list-style-type: none"> Try to start boot-loader mode [refer to section 5.1]. Re-flash ROM if boot loader mode is enabled. 	

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 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	47 of 71

Problem Area	Items to Check	Repair Action	Remark
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

7.3.2 Network/Signal Problems **

Problem Area	Items to Check	Repair Action	Remark
No Signal or Poor Signal	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Check if the phone function is active.	<ul style="list-style-type: none"> If it disabled, please turn it on. 	
	Visually inspect SIM Holder	<ul style="list-style-type: none"> If dirty or oxidized– Clean If damaged – Send to an electrical repair location to change it. 	
	Visually inspect the Antenna Connector	<ul style="list-style-type: none"> If dirty or oxidized– Clean If damaged – Send to an electrical repair location to change it. 	
	Visually inspect the Antenna Cover. (Make sure the antenna is the correct part for region.)	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Replace the Antenna cover 	
	Visually inspect the Antenna spring	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Change the Antenna spring. 	
	Visually inspect the Antenna switch	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Change the Antenna spring. 	

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 <div>宏達國際電子股份有限公司 HTC Corporation</div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual	Page	48 of 71	

Problem Area	Items to Check	Repair Action	Remark
	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Check if the phone function is active.	<ul style="list-style-type: none"> If it disabled, please turn it on. 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

7.3.3 Audio Problems **

Problem Area	Items to Check	Repair Action	Remark
Receiver	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Check the audio volume setting.	<ul style="list-style-type: none"> If disabled--Turn the volume on. 	
	Check the mute button status.	<ul style="list-style-type: none"> Make the mute button turns off. 	
	Visually inspect the Bezel	<ul style="list-style-type: none"> If clogged – Replace Bezel Assy 	
	Check the audio jack connector.	<ul style="list-style-type: none"> If pin2 is short to GND– Replace the audio jack. 	
	Visually inspect the receiver pads	<ul style="list-style-type: none"> If dirty or oxidized – Clean 	
	Visually inspect the receiver.	<ul style="list-style-type: none"> If damaged, dirty or oxidized - Replace Earphone Speaker 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	
Microphone	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	

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 <div>宏達國際電子股份有限公司 HTC Corporation</div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual	Page	49 of 71	

Problem Area	Items to Check	Repair Action	Remark
	Visually inspect the Microphone.	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged or oxidized - Replace Microphone. 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	
Recording	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Check the record key works normally or not.	<ul style="list-style-type: none"> If dirty – Clean If damaged – Replace record switch. 	
Headset	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Check the headset	<ul style="list-style-type: none"> If headset is damaged, change another one. 	
	Check the audio jack status	<ul style="list-style-type: none"> If dirty – Clean If damaged – Replace audio jack. 	

7.3.4 No sound from Loudspeaker or Distorted sound**

Problem Area	Items to Check	Repair Action	Remark
No sound/High pitch noise from Loudspeaker	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Check the audio volume setting.	<ul style="list-style-type: none"> If disabled--Turn the volume on. 	

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 宏達國際電子股份有限公司 HTC Corporation		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	50 of 71

Problem Area	Items to Check	Repair Action	Remark
	Visually inspect the Speaker pads	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Send to an electrical repair location 	
	Visually inspect the Loudspeaker Assembly.	<ul style="list-style-type: none"> If damaged, dirty or oxidized - Replace Loudspeaker Assembly. 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

7.3.5 Vibrator Problems**

Problem Area	Items to Check	Repair Action	Remark
Vibrator	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Check the vibrator function setting.	<ul style="list-style-type: none"> If disabled--Turn the vibrator function on. 	
	Visually inspect the Vibrator pads	<ul style="list-style-type: none"> If dirty or oxidized – Clean 	
	Visually inspect the Vibrator Assembly	<ul style="list-style-type: none"> If damaged, dirty or oxidized - Replace Vibrator Assembly 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

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TOTAL 71 PAGE NO. 50

 宏達國際電子股份有限公司 HTC Corporation		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	51 of 71

7.3.6 Key Problems**

Problem Area	Items to Check	Repair Action	Remark
Keypad board and Keypad.	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Check the keypad FPC assembly	<ul style="list-style-type: none"> If the connection status is not good, assemble the Keypad FPC again. 	
	Visually inspect the Key board	<ul style="list-style-type: none"> If damaged, dirty or oxidized - Replace the key board Ass'y 	
	Visually inspect the Keypad	<ul style="list-style-type: none"> If damaged, dirty or oxidized - Replace the keypad 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	
Power on key	Power on key switch	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged, dirty or oxidized - Replace the power on switch. 	
Volume keys	Volume keys switch	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged, dirty or oxidized - Replace the volume keys switch. 	
Camera key	Camera key switch	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged, dirty or oxidized - Replace the camera key switch. 	

HTC confidential

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	52 of 71

Problem Area	Items to Check	Repair Action	Remark
WiFi key	WiFi key switch	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged, dirty or oxidized - Replace the WiFi key switch. 	

7.3.7 SIM Problems**

Problem Area	Items to Check	Repair Action	Reference Image
SIM connector	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Inspect SIM holder	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Send to an electrical repair location to change it. 	
Unit indicates the incorrect SIM is inserted	Check whether the phone is locked to a particular carrier and whether the correct carrier's SIM is being used	<ul style="list-style-type: none"> Use Correct Carrier SIM or test SIM 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

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TOTAL 71 PAGE NO. 52

 宏達國際電子股份有限公司 HTC Corporation		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	53 of 71

7.3.8 Display Problems**

Problem Area	Items to Check	Repair Action	Remark
No display	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Visually inspect whether the Flex Film is properly connected into the LCD connector	<ul style="list-style-type: none"> If improperly connected - Reestablish proper connection If dirty or oxidized – Clean If damaged – Replace the LCD 	
	Visually inspect the LCD Flex Film	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Replace the LCD 	
	Visually inspect the LCD connector	<ul style="list-style-type: none"> If damaged – Send to an electrical repair location to change it. 	
	If issue has not been resolved →	<ul style="list-style-type: none"> Replace the LCD 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	
LCD no backlight	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Check the Backlight setting in power management.	<ul style="list-style-type: none"> If turned off, please turn it on. 	

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TOTAL 71 PAGE NO. 53



宏達國際電子股份有限公司
HTC Corporation

<div>Doc. No.</div> <div>DOC-00048034</div> <div>REV.</div>		<div>Issued Date</div> <div>2008/10/08</div> <div>A01</div>	
<div>Doc. Title</div> <div>SkyWriter EVDO Service Manual</div>		<div>Page</div> <div>54 of 71</div>	

Problem Area	Items to Check	Repair Action	Remark
	Visually inspect whether the Flex Film is properly connected into the LCD connector	<ul style="list-style-type: none"> If improperly connected - Reestablish proper connection If dirty or oxidized – Clean If damaged – Replace the LCD 	
	Visually inspect the LCD Flex Film	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Replace the LCD 	
	Visually inspect the LCD connector	<ul style="list-style-type: none"> If damaged – Send to an electrical repair location to change it. 	
	If issue has not been resolved	<ul style="list-style-type: none"> Replace the LCD 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	
Touch panel function abnormally	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Visually inspect whether the Flex Film is properly connected into the LCD connector	<ul style="list-style-type: none"> If improperly connected - Reestablish proper connection If dirty or oxidized – Clean If damaged – Replace the LCD 	

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TOTAL 71 PAGE NO. 54



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Doc. Title	SkyWriter EVDO Service Manual		<div>Page</div> <div>55 of 71</div>

Problem Area	Items to Check	Repair Action	Remark
	Visually inspect the LCD Flex Film	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Replace the LCD 	
	Visually inspect the LCD connector	<ul style="list-style-type: none"> If damaged – Send to an electrical repair location to change it. 	
	If issue has not been resolved	<ul style="list-style-type: none"> Replace the LCD 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

7.3.9 Charging/Capacity Problems**

Problem Area	Items to Check	Repair Action	Remark
Battery connector and Mini-USB connector.	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Visually inspect the contact pads of the Battery	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Replace the Battery 	
	Visually the Battery Connector	<ul style="list-style-type: none"> If dirty or oxidized– Clean If damaged –change Battery connector. 	
	Visually inspect the Mini-USB Connector	<ul style="list-style-type: none"> If damaged, dirty or oxidized – Change Mini-USB connector. 	

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TOTAL 71 PAGE NO. 55

Battery looses charge quickly/standby time seems short	<p>NOTE - Some features noticeably reduce the amount of standby time if they are turned on. Some examples are the back light (when turn on all the time), Blue tooth, WiFi, and IR.</p> <p>Perform the following repair action →</p>	<ul style="list-style-type: none"> Replace the Battery 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

7.3.10 Data Communication Problems**

Problem Area	Items to Check	Repair Action	Remark
Data communication error via USB cable	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Check whether it connects with other cables or cradle, customer's cable might be damaged.	If cable is damaged, change another one.	
	Visually inspect the Mini USB Connector	<ul style="list-style-type: none"> If damaged, dirty or oxidized – replace it. 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	57 of 71

Data communication error via IR	Visually inspect the IR component.	<ul style="list-style-type: none"> If dirty or oxidized – clean. If damaged, dirty or oxidized – replace it. 	
	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

7.3.11 Camera Video/ Picture problem**

Problem Area	Items to Check	Repair Action	Remark
Camera function NG	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Visually inspect whether the Camera FPC is properly connected into FPC connector	<ul style="list-style-type: none"> If improperly connected - Reestablish proper connection If dirty or oxidized – Clean If damaged – Replace the Camera module. 	
	Visually inspect the Camera FPC	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Replace the Camera module 	
	Visually inspect the FPC connector	<ul style="list-style-type: none"> If damaged –change it. 	
	If issue has not been resolved →	<ul style="list-style-type: none"> Replace the Camera module 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

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		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	58 of 71

7.3.12 LED indicator problem**

Problem Area	Items to Check	Repair Action	Remark
LED indicator	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Visually inspect the LED.	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Replace the Battery 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

7.3.13 Storage card problem**

Problem Area	Items to Check	Repair Action	Remark
Can't read Storage card	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Visually inspect the Micro SD card.	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Replace the Micro SD card. 	
	Visually inspect the Micro SD card socket.	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Replace the Micro SD card socket. 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

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TOTAL 71 PAGE NO. 58



宏達國際電子股份有限公司
HTC Corporation

Doc. No.

DOC-00048034

REV.

Issued Date

2008/10/08

Revised Date

2008/12/23

A01

Doc. Title

SkyWriter EVDO Service Manual

Page

59 of 71

Problem Area	Items to Check	Repair Action	Remark
Micro SD card can't eject or insert.	Visually inspect the Micro SD card socket.	<ul style="list-style-type: none">If dirty or oxidized – CleanIf damaged – Replace the Micro SD card socket.	

7.3.14 Bluetooth problem

Problem Area	Items to Check	Repair Action	Remark
Bluetooth	Exclude software issue.	<ul style="list-style-type: none">Try to hardware reset the unit and try again.	
	Visually inspect the Antenna Cover.	<ul style="list-style-type: none">If dirty or oxidized – CleanIf damaged – Replace the Antenna cover	
	Visually inspect the Antenna spring	<ul style="list-style-type: none">If dirty or oxidized – CleanIf damaged – Change the Antenna spring.	
	Visually inspect the Antenna switch	<ul style="list-style-type: none">If dirty or oxidized – CleanIf damaged – Change the Antenna spring.	
		<ul style="list-style-type: none">Replace Main Board if necessary.	

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TOTAL 71 PAGE NO. 59

 宏達國際電子股份有限公司 HTC Corporation		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	60 of 71

7.3.15 Wireless LAN problem

Problem Area	Items to Check	Repair Action	Remark
WLAN	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Visually inspect the Antenna Cover.	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Replace the Antenna cover 	
	Visually inspect the Antenna spring	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Change the Antenna spring. 	
	Visually inspect the Antenna switch	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Change the Antenna spring. 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

7.3.16 GPS problem

Problem Area	Items to Check	Repair Action	Remark
GPS	Exclude software issue.	<ul style="list-style-type: none"> Try to hardware reset the unit and try again. 	
	Visually inspect the Antenna Cover.	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Replace the Antenna cover 	

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TOTAL 71 PAGE NO. 60

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	61 of 71

Problem Area	Items to Check	Repair Action	Remark
	Visually inspect the Antenna spring	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Change the Antenna spring. 	
	Visually inspect the Antenna switch	<ul style="list-style-type: none"> If dirty or oxidized – Clean If damaged – Change the Antenna spring. 	
		<ul style="list-style-type: none"> Replace Main Board if necessary. 	

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 <div>宏達國際電子股份有限公司 HTC Corporation</div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual	Page	62 of 71	

Chapter 8 Labeling Plan

8.1 Agency Label-

HTC P/N: 77H00648-00M

Size: 65.00 x 43 mm



HTC P/N	Palm P/N	Unit P/N (80H)	UPC code	Product code
99HN41066NA-100	PTR850HK	80H00680-00	805931036759	P4PE0
99HN41066NA-700	1066NA-BMO	80H00680-02	805931036728	P4GE0
99HN41066NA-I00	1066NA-ALT	80H00680-04	805931036711	P4TE0
99HN41066LA-E00	1066LA-IUS	80H00680-02	805931036704	P4GE0
99HN41066NA-G00	1066NA-TEL	80H00680-02	805931036735	P4GE0

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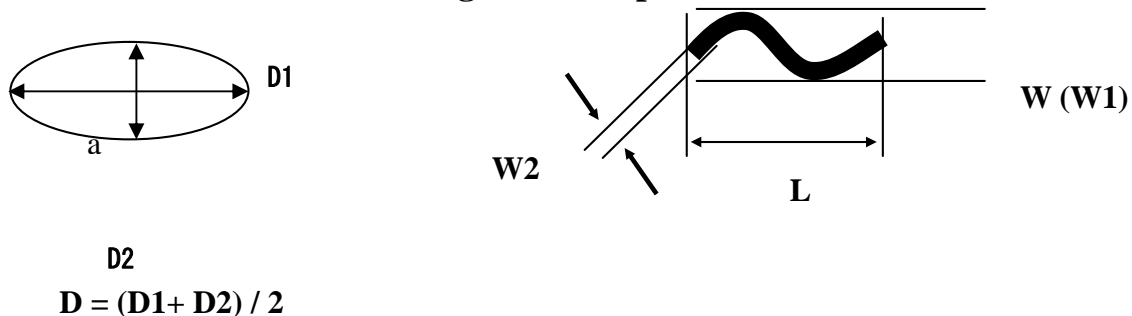
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TOTAL 71 PAGE NO. 62

Chapter 9 LCM inspection criteria (for new LCM)

Definition:

D : diameter , **W** : width , **L** : length , **S** : separation



LCM Electrical Characteristic inspection standard

Inspection Defects			Accept Level
Electrical Characteristic Defects	Bright Dots	Single	Red+ Green+ Blue ≤ 3
			$S \geq 5$ mm
		2 adjacent	0
		3 or more adjacent	0
	Dark Dots	Single	Total number ≤ 2
			$S \geq 5$ mm
		2 adjacent	0
	Dark or Bright lines		0
	All Allowable Dots Defects		Total Number ≤ 3 $S \geq 5$ mm
	Shift and tilt of screen viewed area		The black edge around display area must be detected by front view

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	64 of 71







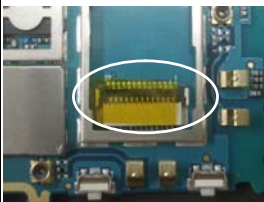
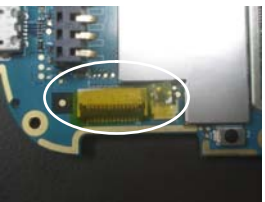







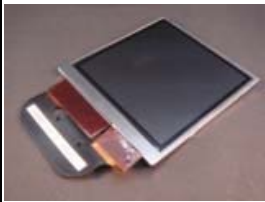




Foreign scratch, objects or lint on power off status	Scratch	$0.03 < W \leq 01\text{mm}$ $L \leq 5 \text{ mm}$ $N \leq 2$
	Lint(linear foreign objects)	$0.03 < W \leq 0.1 \text{ mm}$ $0.3 < L \leq 3.0$ $N \leq 5$
	Spots	$0.1 < D \leq 0.3 \text{ mm}$ $N \leq 4$
	Fish eye on film	$0.1 < D \leq 0.4 \text{ mm}$ $N \leq 4$
	Breakage on film surface	Not acceptable
	Total acceptable defect quantity ≤ 10	

* The LCM criteria follow Document IS-3364, Issued date: 16 May, 06'

 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	65 of 71



Chapter 10 Spare parts list and photo

10.1 Photos of spare parts

36H00710-00M	51H40472-00M	72H00609-00M	72H02548-00M	74H01106-00M
Vibrator	MAIN BOARD	Screw	Screw	Keypad Pre-Assy, AP
				
74H01173-00M	76H02467-00M	76H02468-00M	76H02481-00M	36H01863-00M
Stylus	Tape, camera, connector	Tape, TW, connector	Rubber, Mic	Receiver, PHILIPS
				
73H20161-09M	36H01864-00M	74H01329-00M	35H00114-00M	54H00286-00M
Keypad FPC	Speaker	Keypad Pre-Assy	BATTERY_LI-POLYMER	Camera Module
				
60H00151-00M	80H00720-03	74H01191-00M	74H01232-00M	74H01215-00M
TFT-LCD	Touch Window+ Bezel	Keypad Frame	Middle Frame	Cover Pre-Assy, Battery
				

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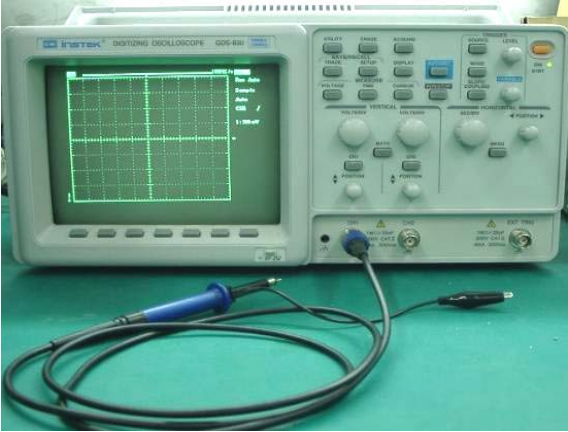



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TOTAL 71 PAGE NO. 65

72H02590-00M	37H00069-00M	73H00303-00M	72H01051-00M	71H02376-00M
Screw, 0.35x4.3	Additional Antenna NA	Antenna cable	Screw, 1.6x3.5	Mute button
				
74H01177-00M	74H01180-00M	74H01181-00M	76H02778-00M	76H02780-00M
Volume button	Power button	WiFi button	LCM Poron	Keypad frame spacer
				
77H00610-00M		76H03088-00M	76H03159-00M	
Water sensitive Label		Mylar, Lanyard	Mylar, RIB, BEZEL	
				


Doc. No.	DOC-00048034		REV.
	Issued Date	2008/10/08	
	Revised Date	2008/12/23	A01
Doc. Title	SkyWriter EVDO Service Manual		Page 67 of 71

Chapter 11 Board level repair

11.1 Equipment and hand tools

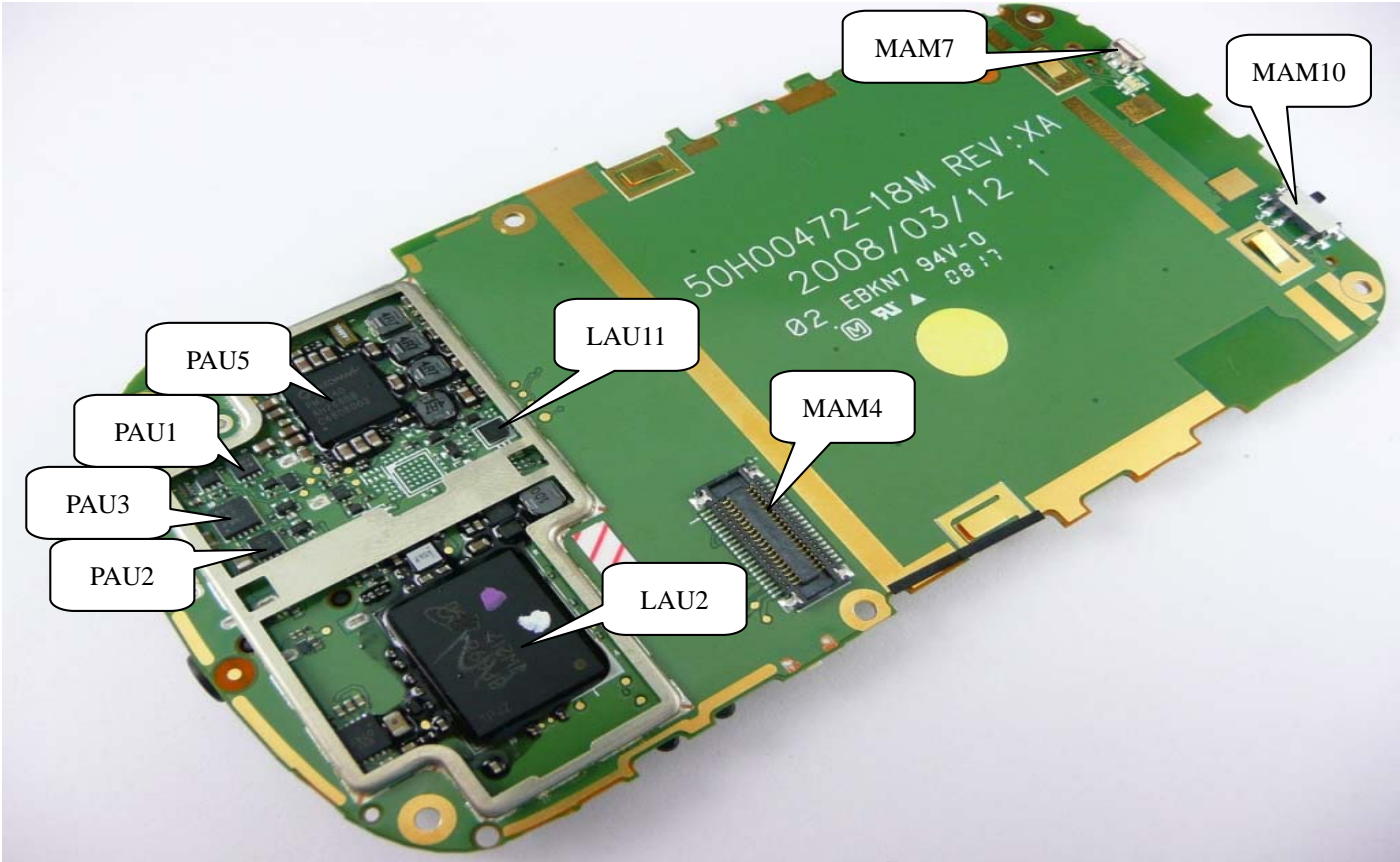
Oscilloscope	Digital DC Power Supply
	
Digital Multi-Meter	Air Heater
	

Doc. No.	DOC-00048034	REV.
Issued Date	2008/10/08	A01
Revised Date	2008/12/23	
Page	68 of 71	

Soldering Station	USB Cable
	

11.2 Main board Key component Block:

Top side



 <div> 宏達國際電子股份有限公司 HTC Corporation </div>		Doc. No.	DOC-00048034	REV.
		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	70 of 71

Location	Description	HTC p/n
TAM3/TAM5/TGM2/TGM4/ TBGND1/TBANT1	Spring,RH-PR-CP-A0059,RAY HOME ,Antenna, Kaiser	*72H02020-00M
RAM2/RGM2/RWM1	Connector RF,6P,2Pitch,MM8130-2600,MURATA,2.5*2.5*1.5mm	*75H00734-00M
*MAM12/13/14/15	Switch,LS12K2-T,CITIZEN,3.85*2.9*1.55mm	36H00515-00M
*MAM3	Switch,SKRKAEE010,ALPS	36H00410-00M
*MAM18	Connector FPC,4P,0.5Pitch,FH34S_4S_0.5SH,HIROSE	75H00709-00M
*MAM2/9	Connector FPC,27P,0.3mmPitch,FH23-27S-0.3SHW(05),HIROSE,CAVALIER	75H00583-00M
*MAM16	Connector Device, Spring battery connector,4P,2.5pitch,250042MB004G322ZR,SUYIN	75H00758-00M
*MAM1	Connector I/O,5P,0.65pitch,ZX62D-AB-5P8,HIROSE	75H00789-00M
*MAM6	Audio Jack,JP011-D4BA-3602XT,3.5mm,T-MEC	36H00218-11M
AAU3	Microphone,SPM0206HE3,KNOWLES,4.72*3.76*1.27mm	*36H00457-00M
*LAU10	IR,HSDL3208,AGILENT,85/-25degC,7*2.8*1.6mm	29H00085-00M
*MAM11	Connector SD Card,11P,1.1pitch,502702-0891,MOLEX,0.5A,10V	75H00760-10M
RAM4/RAM5	Connector RF,MURATA,MM4829-2702B,4,0.8mm	75H00750-00M
TAM6	Antenna-W/O Elec Inspection,ACON	36H00639-00M
PAC76	Gold Cap,0.07F,70ohm,3.3V,XH414H IV01E,SEIKO	16H00017-00M
LAU9	Controller,TC358720XBG,FBGA-81,TOSHIBA	30H80081-00P
LAU1	CPU,QUALCOMM,MSM7501A,CSP543,528MHz	30H00104-01M
LAU3	CPLD,XILINX,XC2C64A-7CPG56C,CPG56	30H50000-00M
RAU3	RF-IC,QUALCOMM,RTR6500,QFN	30H60223-00M
RAU4	RF-IC,TRIQUINT,TQP4M3018,MLP-12,Antenna switch	30H60184-00M
RAP1	Filter,ACMD-7403,AVAGO TECH.	25H00546-00M
RAU1	RF-IC,ANADIGICS,AWT6332,M27	30H60222-00M
RAU2	RF-IC,ANADIGICS,AWT6331,M27	30H60221-00M
RGU2	RF-IC,AVAGO TECH.,ALM-1412,Reel	30H60200-00M
BTU1	RF-IC,TI,BRF6300,BGA	30H60158-00M
WPU1	Misc IC,Power management IC,TI,WL1251PM,ZQS	30H90113-00M
WBU1	RF+NON RF,TI,WL1251,ZQZ	30H70017-00M
WRU1	RF-IC,TI,WL1251FEBRSCR,QFN	30H60156-00M

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TOTAL 71 PAGE NO. 70

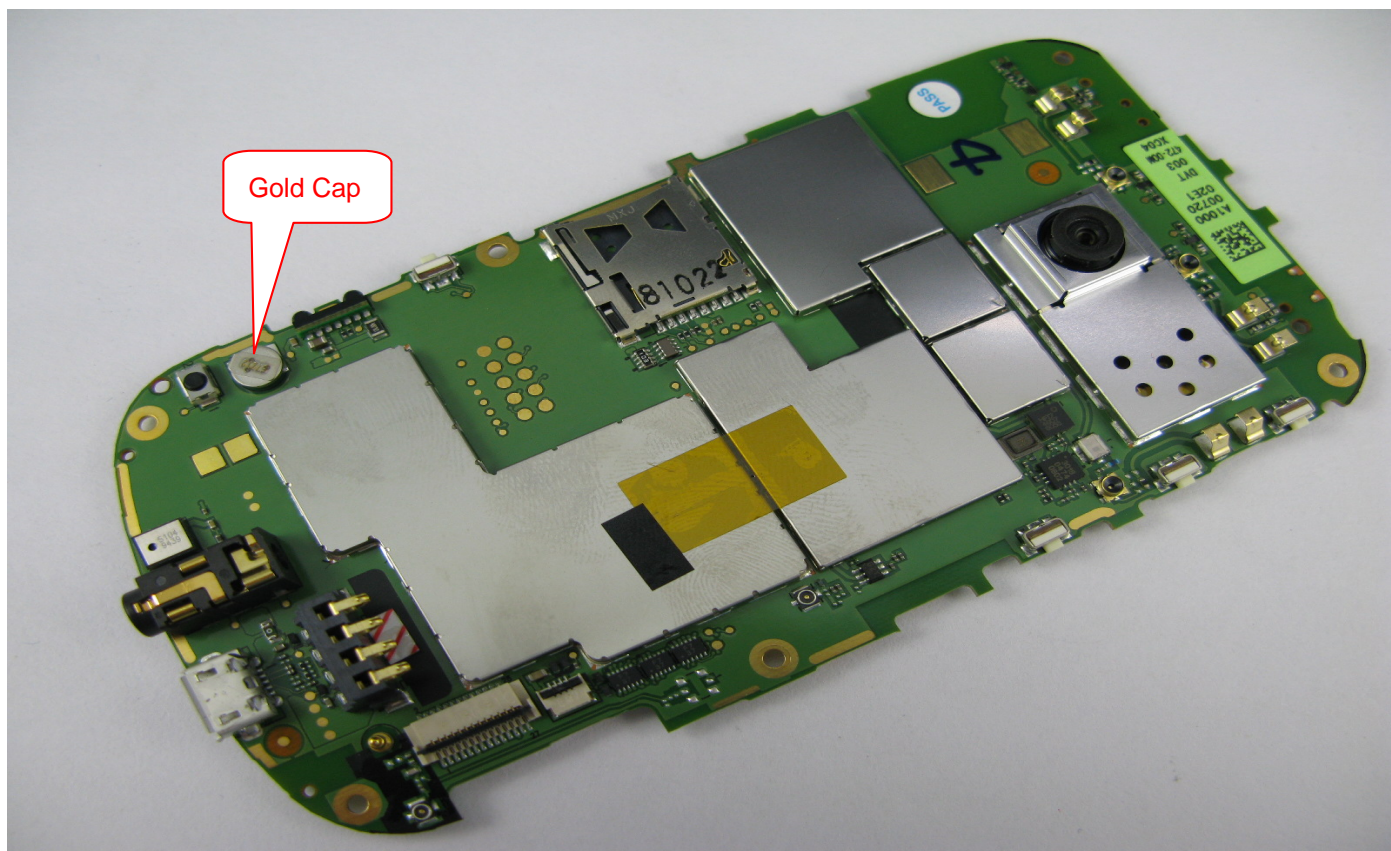
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		Issued Date	2008/10/08	A01
		Revised Date	2008/12/23	
Doc. Title	SkyWriter EVDO Service Manual		Page	71 of 71

Appendix 1

Notification once performing Golden cap replacement

If you perform M/B replacement, must take care for following notices:

1. If you use hot gun to replace any component or use solder iron to replace component that next to G/C .Please use solder iron to remove golden capacitor before repairing. **Prohibit using hot gun to remove golden capacitor to prevent damage.**
2. If repaired M/B was removed G/C before repairing. Please use solder iron to change new G/C to M/B after repaired. The condition of solder iron as bellow:
 - (1) The temperature of solder iron must be under 350 degree C (for lead-in model) , 380 degree C (for lead-free model).
 - (2) The heating time of solder iron must be under 5 seconds.
 - (3) Solder iron can not contact with the body of G/C.
 - (4) **Prohibit recycling use golden capacitor to product.**



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