

# Equipment List, Mechanical

Applicable for Z780a, Z780i, TM506

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## 1 General

This document describes the minimum required equipments for the Mechanical Repair Process of the Z780a, Z780i mobile phones. Equipment listed without a part number is not orderable from Sony Ericsson and must be bought locally.

## 2 Column Definitions

The matrices in the end of the equipment tables describe where the actual equipment is needed (marked with an X) or may be needed/optional (marked with a Z).

Flash upgrade:      Equipment for downloading software to the unit, both signalling and test-program.  
Manual test:        Equipment necessary to perform a manual test.  
Repair:              Equipment necessary for replacing components.

The columns that assist in specifying and/or clarifying the equipment needed are considered description type columns.

- Description      The name of the equipment.
- Part Number    The Sony Ericsson part number to use when ordering from Sony Ericsson.
- Comments      Additional information that helps to specify or clarify the equipment.

### 3 Repair Equipment, Mechanical

Some of the required equipment will be provided by Sony Ericsson and some equipment has to be sourced locally. This chapter will separate these equipments.

#### 3.1 Sony Ericsson Provided Repair Equipment

Description	Part Number	Comments	Upgrade	Flash	Manual Test	Repair
DCU-65/USB Cable	RPM131 12	Interface cable between PC and phone	X			
Torque Screwdriver *	NTZ 112 459	Torque set to 18 Ncm for Torx Bit T6 Torque set to 12 Ncm for Torx Bit T5				X
Bits (T6)	NTZ 112 288	Spare part to screwdriver				X
Bits(T5)	NTZ 112 478R1	Spare part to screwdriver				X
Front opening tool	NTZ 112 302/2					X
Flex film assembly tool	NTZ 112 521	Tweezers for flexfilms				X
Dummy Battery	NTZ 112 533	Dummy battery (BST-33)	Z			
256MB Memory Stick Micro(M2)	KDR 109 171/256	This item is needed to test the applicable product's memory slot.			X	
Plectrum/SVC & Repair	NTZ 112 590	"Guitar Pick"				X

\*Any screwdriver that fulfils torque and bit demand can be used.

The matrix describes where the actual equipment is needed, marked with an X, or may be needed/option, marked with a Z.

## 3.2 Picture of equipments orderable from Sony Ericsson

Pictures of tools that is orderable from Sony Ericsson.

			
KDR 109 171/256	NTZ 112 590	RPM131 12	NTZ 112 459
			
NTZ 112 288(T6)	NTZ 112 478R1 (T5)	NTZ 112 302/2	NTZ 112 521
			
NTZ 112 533(BST-33)			

### 3.3 Equipment Provided by Other Suppliers

This is the list of equipments provided by other suppliers than Sony Ericsson

		Flash Upgrade	Manual Test	Repair
Description	Comments			
Battery	Model# BST-33 Purchase from local vendor.	X	X	
-Battery Charger	Standard SonyEricsson charger applicable for Z780a, Z780i,TM506		X	
Computer	Minimum Pentium III 500 Mhz 128 Mb RAM or better. At least 2USB ports	X		
Tweezers	ESD-safe			X
Dentist hook	To be used when removing the adhesives.			X
Isopropyl Alcohol	To be used when removing glue.			X
Cotton Gloves	ESD-safe			X
Zebra Printer	<b>Current Model Options:</b> <ul style="list-style-type: none"> <li>• <b>110XIIIPlus</b> or <b>Z4Mplus</b></li> </ul> These models use a DB9 Male-DB9 Female Null Modem  <b>Discontinued Model Options:</b> <b>NOTE – The following models may also be used, but Zebra has discontinued selling them.</b> <ul style="list-style-type: none"> <li>• 90xi Series</li> <li>• Z4M</li> <li>• Z4000 deluxe</li> </ul> These models use a DB25 Male-DB9 Female Null Modem			Z

		Flash Upgrade	Manual Test	Repair
Description	Comments			
Null Modem Cable	<p>This cable connects the Zebra printer to the computer. Two companies that carry this type of cable are CDW (www.cdw.com) and QVS (www.qvs.com). Part numbers for the <b>DB9 Male-DB9 Female version:</b> <b>CDW – 361875</b> (6 Feet Long)</p> <p>Part numbers for the <b>DB25 Male-DB9 Female version:</b> <b>CDW – 375939</b> (6 Feet Long) <b>QVS – CC314-06</b> (6 Feet Long) <b>QVS – CC314-10</b> (10 Feet Long)</p>			Z
Hot Air Flow Repair Station, Medium.	To be used when removing phone label (if needed)			Z
IR-device	To be used to make connection between the phone and the device		X	
Bluetooth-device	To be used to make connection between the phone and the device		X	
Hands free equipment.	To be used to verify the system connector. Applicable for Z780a, Z780i, TM506		X	
Operator SIM-card	To be used when making a landline call.		X	
Barcode Scanner	The device must be able to decode code128 and 128C			Z
Ionized Air Gun or blower	neutralizes the static, therefore allowing dust and fine particles to be easily blown off.			Z
Power supply	NOTE: Only necessary if using the Battery Eliminator.	Z		
Power cables Red & Black	Minimum cross sectional area of conductor: 1.2 mm <sup>2</sup> Maximum length: 1.5 m	Z		
ESD wristband				Z
ESD Gloves				Z
Nylon Pointer				Z

\*Any screwdriver that fulfils torque and bit demand can be used.

The matrix describes where the actual equipment is needed, marked with an X, or may be needed/option, marked with a Z

### 3.4 AGPS Test Equipment

The ability to test AGPS functionality on the product is required, but two options are available. Repair centres may select the option that best fits their spatial, financial, operational needs, etc. Once a repair centre selects an option, the centre must be able to perform that option reliably as determined by SEMC certification standards.

After installing the equipment per manufacturer's instructions, the repair centre will need to use a satellite signal meter to measure the signal strength being radiated from the antenna. The signal strength should be between -140dBm and -130dBm.

#### 3.4.1 Option 1: Re-radiating GPS System

**NOTE: Repair Centres located inside the USA must meet FCC regulatory standards for re-radiating satellite signals. Other regions may have similar regulations. Repair centres are responsible for knowing and following these regulations.**

The FCC regulatory policy that is currently in effect in the U.S.A. allows GPS Re-Radiating Kits to be sold to the following:

- International Customers (outside the U.S.A.)
- Agencies of the US Federal Government

--All Branches of the US Military or Parties Operating under the Direction of US Federal Government



- Parties that have received an STA or Experimental License under part 5 of the FCC rules
- Parties that will be operating GPS Re-Radiators in a shielded room or under an approved GPS Networking Re-Radiating Hood

Centres in the U.S.A. that do not think they are eligible under any of the above criteria should visit the FCC link below to ask for more information about how to file for an Experimental License under part 5 of the FCC rules or see the second link below to file an application.

[http://wireless.fcc.gov/index.htm?job=rules\\_and\\_regulations](http://wireless.fcc.gov/index.htm?job=rules_and_regulations)



## Option 1: Re-radiating GPS System Continued

Several manufacturers sell re-radiating kits. Below are links to some. Important considerations are environmental protection for the external antenna, signal radiating radius of the internal antenna, and length of the transmission cable. Excessive cable lengths will attenuate the signal too much.

			Test	Repair
Description	Comments	Picture		
Aucon AS-47 and 48	Wireless GPS ReRadiating-System / GPS-Repeater with up to 12 meters transmission distance or with up to 30 meters transmission distance with the AS-48! <a href="http://www.aucon.de/technical_data_sheet(70k)pattern(33k)demonstration_pics(300_kb)">http://www.aucon.de/technical_data_sheet(70k)pattern(33k)demonstration_pics(300_kb)</a>		X	
GPS Source GPSRKL1	The GPSRKL1 Repeater kit is a low power GPS frequency repeater for areas where the GPS signal is not present. <a href="http://www.gpssource.com">www.gpssource.com</a>		X	
Continued on next page				




## Option 1: Re-radiating GPS System Continued

			Test	Repair
Description	Comments	Picture		
GPS Networking HNRRKIT	<p>The HNRRKIT is a complete re-radiating system to allow you to re-radiate the GPS L1 carrier signal indoors. The HNRRKIT consists of a Roof Antenna, a plug-in re-radiating amplifier &amp; a re-radiating antenna.</p> <p><a href="http://www.gpsnetworking.com">www.gpsnetworking.com</a></p>		X	
Mobile GPS Online RK-304	<p>GPS L1 Band GPS Reradiator Kits with reradiating range 30 meters</p> <p><a href="http://mobilegpsonline.com/mgpsos/index.php?main_page=index&amp;zenid=58babc16b365ad58702c1a87f7f37f90">http://mobilegpsonline.com/mgpsos/index.php?main_page=index&amp;zenid=58babc16b365ad58702c1a87f7f37f90</a></p>		X	

			Test	Repair
Description	Comments	Picture		
GPS Receiving Device	<p>Optional equipment used to confirm if the test equipment is radiating appropriate signal strength. If test units continually fail to receive signal, then use a known-good GPS receiving device to ensure the equipment is setup correctly.</p> <p>GPS receiving devices include watches, navigators, etc.</p>		Z	

### 3.4.2 Option 2: Satellite Signal Simulator System

			Test	Repair
Description	Comments	Picture		
Spirent STR4500	12 Channel GPS Simulator with Simplex Software (scenario replay units) <a href="http://www.spirentcom.com">www.spirentcom.com</a> <a href="http://www.spirentcom.com/documents/67.pdf?wt=2&amp;az-c=dc">http://www.spirentcom.com/documents/67.pdf?wt=2&amp;az-c=dc</a>		X	
Synergy Systems PN-05	Passive GPS antenna. Part number 10001703G Bare 15mm sq element, 15mm coax, ra SMA plug <a href="http://www.synergy-gps.com/component/option,com_frontpage/Itemid,1/">http://www.synergy-gps.com/component/option,com_frontpage/Itemid,1/</a>		X	

			Test	Repair
Description	Comments	Picture		
GPS Receiving Device	<p>Optional equipment used to confirm if the test equipment is radiating appropriate signal strength. If test units continually fail to receive signal, then use a known-good GPS receiving device to ensure the equipment is setup correctly.</p> <p>GPS receiving devices include watches, navigators, etc.</p>		Z	

## 4 Revision History

Rev.	Date	Changes / Comments
1	2008-06-3	First release
2	2008-06-13	Adding TM506 project
3	2008-11-14	Adding chapter 3.4 GPS equipment