

# Equipment List, Electrical

Applicable for K800 and K790

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# 1 General

This document describes the equipment needed, in addition to the equipment listed in the Mechanical Equipment List, to upgrade the applicable product(s)'s software, functional test and to repair the product(s) at an Electrical Repair Level. The first section is equipment that can be purchased from a Sony Ericsson Parts and Tools warehouse. The second section is equipment that must be purchased from other vendors.

## 2 Column Definitions

### 2.1 Description Columns

- Pos = (Position Number) = The equipment reference numbers used in the Installation Instruction documents.
- Description = The name of the equipment.
- Part Number = The Sony Ericsson part number to use when ordering from a Sony Ericsson Parts and Tools warehouse.
- Comments = Additional information that helps to specify or clarify the equipment.




### 2.2 Process Columns


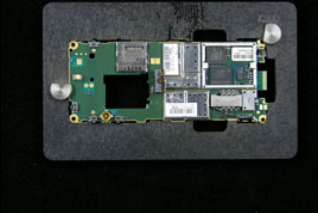


These columns show which processes use the equipment. An "X" in a column indicates that the equipment must be used, and a "Z" in a column indicates that the use of that equipment is optional.

- Test = A manual and/or automated method of evaluating the functionality of a phone.
- Repair = A method of fixing a phone.


### 3 Repair Equipment, Electrical

#### 3.1 Sony Ericsson-Provided Repair Equipment

Pos	Description	Part Number	Comments	Picture		
					Test	Repair
9	Sony Ericsson Programming Interface (SEPI)	LTN 214 1484	The Sony Ericsson Programming Interface (SEPI) is used in conjunction with the SEPI interface cable (POS 10), the USB computer cable (POS 43) and battery charger (POS 27) to perform calibration on this product.			X
10	Sony Ericsson Programming Interface (SEPI) cable	KRY 101 1119	A battery charger (POS 27) needs to be connected to this cable during calibration.			X
51	RF Cable	RPM 119 855			X	X

Pos	Description	Part Number	Comments	Picture	Test	Repair
52	Battery Eliminator	NTZ 112 533	If using the Battery Eliminator to power the handset during the GNG Test or Calibration routine you must use a high quality DC source. (See POS-77 for Power Supply requirements.)		Z	Z
54	PCB Repair Fixture	1204-1015	Used to hold the PCB during repair.			X
62	RF Probe Assembly	RNT 403 303/001	To be connected to the RF cable (POS-51).		Z	X
63	Holder RF Connector	NTZ 112 570	Used together with RF probe and RF cable.		Z	X

### 3.2 Equipment Provided by Other Supplier

Pos	Description	Comments	Picture	Test	Repair
27	Battery Charger (Standard SEMC charger applicable for K800)	The battery charger needs to be connected to the Sony Ericsson Programming Interface Cable during calibration.			X
43	USB Computer Cable	Type A to Type B USB cable.  This is part of the hardware needed for performing calibration. This cable connects the computer (POS 96) to the SEPI (POS 9).			X
	<b>Anritsu MT 8801B</b> Required Components: <ul style="list-style-type: none"> <li>• MT8801B (Radio Com. Analyser)</li> <li>• MT8801B-02 (SG-local)</li> <li>• MX880115A (GSM Measurement Software)</li> </ul> Required Software: <ul style="list-style-type: none"> <li>• Main 4.02</li> <li>• System 4.05</li> </ul>	<b>Note: This instrument only supports GNG testing for the K790.</b>  <b>Note: It is strongly recommended that the instrument vendor be contacted before ordering this setup to ensure that the options stated are still valid or that no part numbers have changed.</b>		X	

Pos	Description	Comments	Picture	Test	Repair
	<b>Anritsu MT 8801C</b> Required Components: <ul style="list-style-type: none"> <li>• MT8801C (Radio Com. Analyser)</li> <li>• MX880115A (GSM Measurement Software)</li> </ul> Required Software: <ul style="list-style-type: none"> <li>• Main 4.02</li> </ul> System 4.05	<p>Note: Note: This instrument only supports GNG testing for the K790.</p> <p>Note: It is strongly recommended that the instrument vendor be contacted before ordering this setup to ensure that the options stated are still valid or that no part numbers have changed.</p>		X	
	<b>Anritsu MT 8802A</b> Required Components: <ul style="list-style-type: none"> <li>• MT8802A (Radio Com. Analyser)</li> <li>• MX880215A (GSM Measurement Software)</li> </ul> Required Software: <ul style="list-style-type: none"> <li>• Main 1.11</li> <li>• System 2.07</li> </ul>	<p>Note: This instrument only supports GNG testing for the K790.</p> <p>Note: It is strongly recommended that the instrument vendor be contacted before ordering this setup to ensure that the options stated are still valid or that no part numbers have changed.</p>		X	

Pos	Description	Comments	Picture	Test	Repair
	<b>Agilent 8960</b> Required Components: <ul style="list-style-type: none"> <li>• E5515C (8960 Series 10 Mainframe)</li> <li>• Option E5515C-002 (2<sup>nd</sup> RF source)</li> <li>• Option E5515C-003 WCDMA HW Option</li> <li>• Option E5515C-201 GSM and GPRS Func.</li> </ul> Required Software <ul style="list-style-type: none"> <li>• E1985B TA Fast switching</li> <li>• E1963A WCDMA Test application</li> </ul>	Some older versions of the 8960 Series 10 mainframes may need to have a hardware upgrade in order to have WCDMA capabilities. See your local Agilent representative for details.  <i>Note: It is strongly recommended that the instrument vendor be contacted before ordering this setup to ensure that the options stated are still valid or that no part numbers have changed.</i>		X	X
	<b>Willtek 4403/4405/4407</b>  Required Components: <ul style="list-style-type: none"> <li>• Firmware 4.21 or greater</li> <li>• The 4403 instrument needs to have option # M897163 installed.</li> </ul>	<i>Note: It is strongly recommended that the instrument vendor be contacted before ordering this setup to ensure that the options stated are still valid or that no part numbers have changed.</i>		X	X



Pos	Description	Comments	Picture	Test	Repair
	<b>Rohde &amp; Schwarz CMU200</b> Required Components <ul style="list-style-type: none"> <li>• CMU200 mainframe (Base Unit)</li> <li>• Options CMU-B11, CMU-B21, CMU-B52, CMU-B54</li> <li>• Required SW package: CMU-PK20</li> </ul>	<b>Note:</b> It is strongly recommended that the instrument vendor be contacted before ordering this setup to ensure that the options stated are still valid or that no part numbers have changed.		X	X
77	Power Supply (w/digital readout)  <b>NOTE!</b> If using the Power Supply in conjunction with the Battery Eliminator (Dummy Battery) to power the phone during the GNG test or Calibration routine a high quality DC source that meets the following requirements <u>must</u> be used.	Device Requirements: <ul style="list-style-type: none"> <li>• Output Voltage: 0-5 volt minimum.</li> <li>• Output Current: 0-2 amps minimum.</li> <li>• Transient response time: &lt; 100 <math>\mu</math>s</li> </ul> Some examples of Power Supplies that meet these requirements are as follows: <ul style="list-style-type: none"> <li>• Agilent 66xx series</li> <li>• Agilent 663x series</li> </ul>		Z	Z



Pos	Description	Comments	Picture	Test	Repair
78	Small Convection (Hot Air) Device	Device Requirements: <ul style="list-style-type: none"> <li>The device should allow variable adjustment over a temperature range.</li> <li>The device should be capable of reaching an upper temperature of 426.7°C (800°F) or more.</li> </ul> The range of airflow the device is capable of generating should fall under 20 litre/minute.			X
79	Large Convection (Hot Air) Device	<b>Certain components on the parts list can only be replaced using this device. These parts are specified in the parts list.</b> <ul style="list-style-type: none"> <li>The device should allow variable temperature adjustment and be capable of reaching an upper temperature of 426.7°C (800°F) or more.</li> <li>The range of airflow the device is capable of generating should be above 20 litre/minute.</li> </ul>			X
80	Nozzles for Large Convection (Hot Air) Device	NOTE: Only necessary if you have a large convection device.			X
81	Digital Multi-meter	Used for troubleshooting failures			Z
82	Microscope	Minimum magnification required is 10x			X



Pos	Description	Comments	Picture	Test	Repair
83	GPIB Card	National Instruments or Keithley  NOTES: <ul style="list-style-type: none"> <li>Drivers are required and should be supplied with a card.</li> <li>A GPIB card is not required if testing is being performed using the Willtek 420x instrument.</li> </ul>		Z	X
84	GPIB Cable	This cable is only required if a GPIB card is used.		Z	X
88	Power cable – Red  <i>NOTE: Only necessary if using the Battery Eliminator (Dummy Battery).</i>	Cable Requirements: <ul style="list-style-type: none"> <li>Minimum cross sectional area of conductor = 1.2mm<sup>2</sup></li> <li>Maximum length = 1.5 m</li> <li>One end of cable must have a male banana-type connector to be able to interface with the battery eliminator.</li> <li>The other end of the cable needs whatever connection is necessary to connect to the power supply that you have.</li> </ul>		Z	Z


Pos	Description	Comments	Picture	Test	Repair
89	Power cable – Black  <i>NOTE: Only necessary if using the Battery Eliminator (Dummy Battery).</i>	Cable Requirements: <ul style="list-style-type: none"> <li>• Minimum cross sectional area of conductor = 1.2mm<sup>2</sup></li> <li>• Maximum length = 1.5 m</li> <li>• One end of cable must have a male banana-type connector to be able to interface with the battery eliminator.</li> <li>• The other end of the cable needs whatever connection is necessary to connect to the power supply that you have.</li> </ul>		Z	Z

Pos	Description	Comments	Picture	Test	Repair
90	Component baking oven	<p>Temperature requirements: 125°C +5°C/-0°C</p> <p>Required for drying moisture sensitive components.</p> <p>Below are links to several companies that sell convection ovens.</p> <p><a href="http://www.cascadetek.com/forcedlist.php">http://www.cascadetek.com/forcedlist.php</a></p> <p><a href="http://www.wisoven.com/lab1.htm">http://www.wisoven.com/lab1.htm</a></p> <p><a href="http://www.shellab.com/products.html">http://www.shellab.com/products.html</a></p> <p><a href="http://www.terrauniversal.com/products/ovens/imperiaivmechcon.php">http://www.terrauniversal.com/products/ovens/imperiaivmechcon.php</a></p> <p><a href="http://www.labsynergy.com/products_laboratoryovens.asp?keyword=*laboratoryovens">http://www.labsynergy.com/products_laboratoryovens.asp?keyword=*laboratoryovens</a></p>			X






Pos	Description	Comments	Picture	Test	Repair
91	<p>RF Shield Package</p> <p><b>Rohde &amp; Schwarz RF Shield Package</b></p> <ul style="list-style-type: none"> <li>CMU-Z10 – Shield box</li> <li>CMU-Z11 – Antenna Coupler</li> </ul>	<p>Using an RF shield package is one of the options for testing the applicable product(s). Testing of the applicable product(s) can also be performed by using the combination of an RF Probe (POS 62), Holder RF Connector (POS-63) and an RF cable (POS 51).</p> <p><b>NOTE:</b> The Rohde &amp; Schwarz package will require the use of a <b>precision</b> N-type male to SMA female RF adapter to mate with the SEMC RF cable (see POS 110 for adapter ordering information).</p>		Z	
	Flux	<p>Lead-free solder does not require a special flux. The “No Clean” flux used with leaded products is acceptable.</p> <p>Although some manufacturers are developing fluxes specially made for use with lead-free solder (higher evaporation temperatures, less smoke, etc.), these are not required.</p>			X
	Low Static Heat Protection Tape	This tape is required to protect adjacent components from hot air.			X

Pos	Description	Comments	Picture	Test	Repair
96	Computer	<p>One of the following operating systems must be used:</p> <ul style="list-style-type: none"> <li>• Windows 2000 with service pack 2 or higher</li> <li>• Windows XP</li> </ul> <p>Minimum Requirements:</p> <ul style="list-style-type: none"> <li>• One unused PCI slot for GPIB card</li> <li>• 2 USB Ports</li> <li>• The processor and RAM of the computer should at least meet the the minimum requirements specified by the operating system's manufacturer.</li> </ul>		Z	X
99	Test U-SIM	According to your Instrument supplier		X	
109	Printer	<b>Optional, but recommended</b>		Z	Z





Pos	Description	Comments	Picture	Test	Repair
110	RF adapter for RF shield box <ul style="list-style-type: none"> <li>The adapter for a Rohde &amp; Schwarz Shield box must be a <b>precision</b> N-type male to SMA female adapter.</li> </ul>	This adapter is used to connect the RF shield box to the RF cable (POS 51) and is only required if a shield package is going to be used for testing.  Recommended source: <ul style="list-style-type: none"> <li>Pasternack Enterprises – (949) 261-1920 or <a href="http://www.pasternack.com">www.pasternack.com</a></li> <li>Part number: PE9430</li> </ul>		Z	

### 3.3 Lead-free Solder Equipment

The items in this table, and any other soldering tools or material that make physical contact with the solder, must remain lead-free. They must be adequately labelled to make their lead-free status clearly and easily recognized.

				Test	Repair
Pos	Description	Comments	Picture		
	Lead-free Solder  Note: The solder must be composed of Tin, Silver, and Copper, and nothing else. The exact composition ratio may vary, but it must be Tin, Silver, and Copper only. This composition may also be known as SnAgCu or SAC.	Manufacturers of LF Solder: - Tamura ( <a href="http://www.tamura-kaken.co.jp">www.tamura-kaken.co.jp</a> ) Part # TLF-206-93F - Multicore ( <a href="http://www.multicore.com">www.multicore.com</a> ) Part # 96SC - Senju ( <a href="http://www.senju-m.co.jp">www.senju-m.co.jp</a> ) Part # M705			X
	Lead-free Soldering paste	To be used when replacing the RF module.			X
	Lead-free labels (sheet of 24)  SEMC Part # SVF9301379 (These labels are available from the Sony Ericsson Parts and Tools Warehouse.)	Required for labeling all soldering tools and materials that contact the solder.			X
	Soldering Tips				X



				Test	Repair
Pos	Description	Comments	Picture		
	<p>Soldering Iron</p> <p>If one work bench is divided to accommodate both leaded and lead-free solder, then each side of the bench should have its own iron.</p>	<ul style="list-style-type: none"> <li>The device should allow variable temperature adjustment and be capable of reaching an upper temperature of 426.7°C (800°F) or more.</li> </ul>			X
	Wicking Tape				X
	Tip Tinner				X
	Tip Cleaner (steel wool)				X

## 4 Revision History

Rev.	Date	Changes / Comments
A	2006-06-26	Initial Release
B	2006-07-10	Added support for the K790
C	2006-07-31	Removed support for the Rohde & Schwarz CMU200 instrument.
D	2006-09-13	Added support for the Rohde & Schwarz CMU200, Anritsu 8801B, Anritsu 8801C and the Anritsu 8802A instruments.
5	2008-01-28	New PCB Repair fixture added