

# NOKIA 9500

RA-2

**Transceiver characteristics:**

- Full QWERTY keyboard and two 65,536-color displays
- Tri-band operation on five continents
- 80 MB built-in memory, support for additional memory with memory card (MMC)
- High-speed data connectivity with EGPRS (EDGE)
- Wireless LAN access (WiFi, IEEE 802.11b)
- Email, Personal Information Management (PIM), HTML 4.01 / xHTML browser
- Business applications like word processor, spreadsheet, and presentation editor, and viewer (Microsoft compatible, MS Office 97 onwards)
- Office tools: Documents, sheets, presentations (Microsoft compatible, MS Office 97 onwards)
- Security solutions: SSL/TLS, VPN, Ipsec, WPA
- Integrated VGA camera, video recorder, MMS
- Symbian 7.0S OS (series 80 platform), Java MIDP 2.0 and Personal profile
- Advanced voice features: Integrated handsfree, conference call
- Bluetooth technology and Pop-Port™ interfaces for versatile enhancement support

**Transceiver with BP-5L 1300 mAh Li-Ion battery pack**

Talk time	Standby		Note
	WLAN off	WLAN idle	
Up to 4-6 hours	Up to 200-300 hours	Up to 180-240 hours	Depends on network parameters

**Environmental characteristics:**

- Lead-free soldered
- RoHS compliant (Restriction on Hazardous Substances, 2002/95/EC)

## SERVICE MANUAL

### Service Level 1&2

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## CHANGE HISTORY

Status	Version No.	Date	Comments
Draft	0.1	07.09.2004	Environmental characteristics added
Draft	0.2	17.09.2004	Exploded view/disassembly modified
Approved	1.0	24.09.2004	Approval
Approved	2.0	11.10.2004	Approval/service tool and SW-update modified

## 1 INTRODUCTION

The purpose of this document is to help Nokia service levels 1 and 2 workshop technicians to carry out service to Nokia products. This Service Manual is to be used **only** by authorized Nokia service suppliers, and the content of it is **confidential**. Please note that Nokia provides also other guidance documents (e.g. Service Bulletins) for service suppliers, follow these regularly and comply with the given instructions.

While every endeavor has been made to ensure the accuracy of this document, some errors may exist.

*If you find any errors or if you have further suggestions, please notify Nokia using the address below:*

<mailto:cc-ts-rc.documentation@nokia.com>

Please keep in mind also that this documentation is continuously being updated and modified, so watch always out for the newest version.

### Warnings and Cautions

Please refer to the phone's user guide for instructions relating to operation, care and maintenance including important safety information. Note also the following:

#### Warnings:

1. CARE MUST BE TAKEN ON INSTALLATION IN VEHICLES FITTED WITH ELECTRONIC ENGINE MANAGEMENT SYSTEMS AND ANTI-SKID BRAKING SYSTEMS. UNDER CERTAIN FAULT CONDITIONS, EMITTED RF ENERGY CAN AFFECT THEIR OPERATION. IF NECESSARY, CONSULT THE VEHICLE DEALER/MANUFACTURER TO DETERMINE THE IMMUNITY OF VEHICLE ELECTRONIC SYSTEMS TO RF ENERGY.
2. THE HANDPORTABLE TELEPHONE MUST NOT BE OPERATED IN AREAS LIKELY TO CONTAIN POTENTIALLY EXPLOSIVE ATMOSPHERES EG PETROL STATIONS (SERVICE STATIONS), BLASTING AREAS ETC.
3. OPERATION OF ANY RADIO TRANSMITTING EQUIPMENT, INCLUDING CELLULAR TELEPHONES, MAY INTERFERE WITH THE FUNCTIONALITY OF INADEQUATELY PROTECTED MEDICAL DEVICES. CONSULT A PHYSICIAN OR THE MANUFACTURER OF THE MEDICAL DEVICE IF YOU HAVE ANY QUESTIONS. OTHER ELECTRONIC EQUIPMENT MAY ALSO BE SUBJECT TO INTERFERENCE.

#### Cautions:

1. Servicing and alignment must be undertaken by qualified personnel only.
2. Ensure all work is carried out at an anti-static workstation and that an anti-static wrist strap is worn.
3. Use only approved components as specified in the parts list.
4. Ensure all components, modules screws and insulators are correctly re-fitted after servicing and alignment.  
Ensure all cables and wires are repositioned correctly.



Electrostatic discharge can easily damage the sensitive components of electronic products. Therefore every Service Supplier has to take care of all precautions, which are mentioned in the service level related "Service Partner Requirements", available on Nokia Partner Web Site. Also see ESD Protection Requirements in this Service Manual.



## 2 GENERAL REPAIR INFORMATION

In this section the technician will get some general hints how to carry out repairs:

- To familiarize oneself with Nokia product read the tutorials or user guide on [www.nokia.com](http://www.nokia.com) -->Support--> Phones, by selecting the Phone Model.
- Before starting the repair you must take care of ESD precautions like being in your ESD Protected Area and connecting your wristband.
- Use gloves to avoid corrosion and fingerprints.
- Protect windows and displays with a film to avoid dust and scratches.
- When cleaning the pads you have to use a soft cloth/ESD brush and Isopropanol. It is not allowed to use a glass fiber pencil because it scratches the surface and will lead later on to corrosion.
- Mechanical parts (except shielding lids and bent parts), which didn't repair the failure, can be reused, if they are not soldered.
- When removing the shielding lids make sure to replace them with new ones, otherwise the high-frequency leakage can have an influence on the device.  
Always use original Nokia spare parts.  
Check the soldering joints of the parts, which are concerned regarding the indicated error (e.g. soldered connectors or switches) and resolder them if necessary (Level 2 only).  
Remove redundant soldering flux after repair.
- Meet the torque requirements when assembling the unit (see also the document "torques for transceiver assembly" on Nokia Partner Web Site).
- Always use your own equipment for testing where you are sure that it works. E.g. if the customer complains about charger function, please test the phone with your own charger to be sure if phone or charger causes the malfunction.
- When doing the fault log entries, always note the Item code, which caused the malfunction. Also, fill in the appropriate part code from the assembly, if needed.
- Please be aware that some malfunctions could be software related and solved by an update.
  
- There are several documents available on PWS/CarePoint, which have to be followed:
- First, take care for the latest content pages of Service Bulletins, which are always available for each folder on Nokia Partner Web Site. This is also important to recognize, if existing documents have become invalid.
- The service level indicator at the bottom of each document tells the appropriate destination.

### Downloads > Support Library >

1. Instructions
2. General Service Bulletins
3. Product related documents
4. Spare Part Service Bulletins
5. Service Tools Service Bulletins
6. Common Softwares Service Bulletins  
etc,...

Use General SB-217 as a reference or overview.

Please also check Nokia Partner Web Site (PWS) for latest news and files on a regular basis.

### 3 PATHFINDER FOR WORKSHOP STAFF

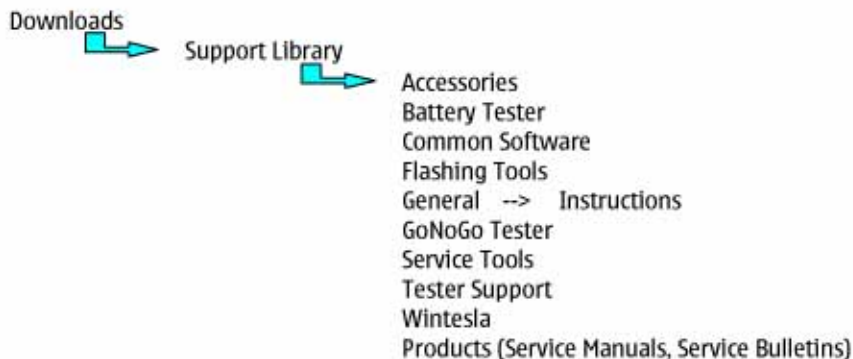
In addition to the information in this Service Manual, there are several instructions and information, which have to be followed.

Main documentation database is Nokia [Partner Website](#), which refers also to [Nokia Care Point](#) with the purpose of serving different multimedia content, like video clips or interactive tutorials.

Nokia Partner Web Site	Nokia Care Point (access through Partner Web Site)
<p>Nokia Partner Web Site for EMEA region is the most important document database for all service suppliers (level 1-4). All service relevant information like e.g. Service Manuals, Service Bulletins or general instructions are available. Content is restricted according your access level. To be kept up-to-date also concerning newest software updates, a daily check of "latest updates in support library" is needed.</p>	<p>Nokia Care Point is repair support and training channel for Nokia service suppliers (mainly for service levels 1 and 2). By providing visual and easy to learn support and training material, such as illustrative repair videos, troubleshooting with pictures, product information and general repair information, Nokia Care Point offers user-friendly channel for service suppliers to learn technical issues.</p>
	

It is mandatory to watch for newest technical and organizational information on a daily basis to be updated as required (see "Latest Updates in support Library"). Every new information has to be processed and implemented as soon as possible.

When logged into PWS you can also find needed information in different folder like:

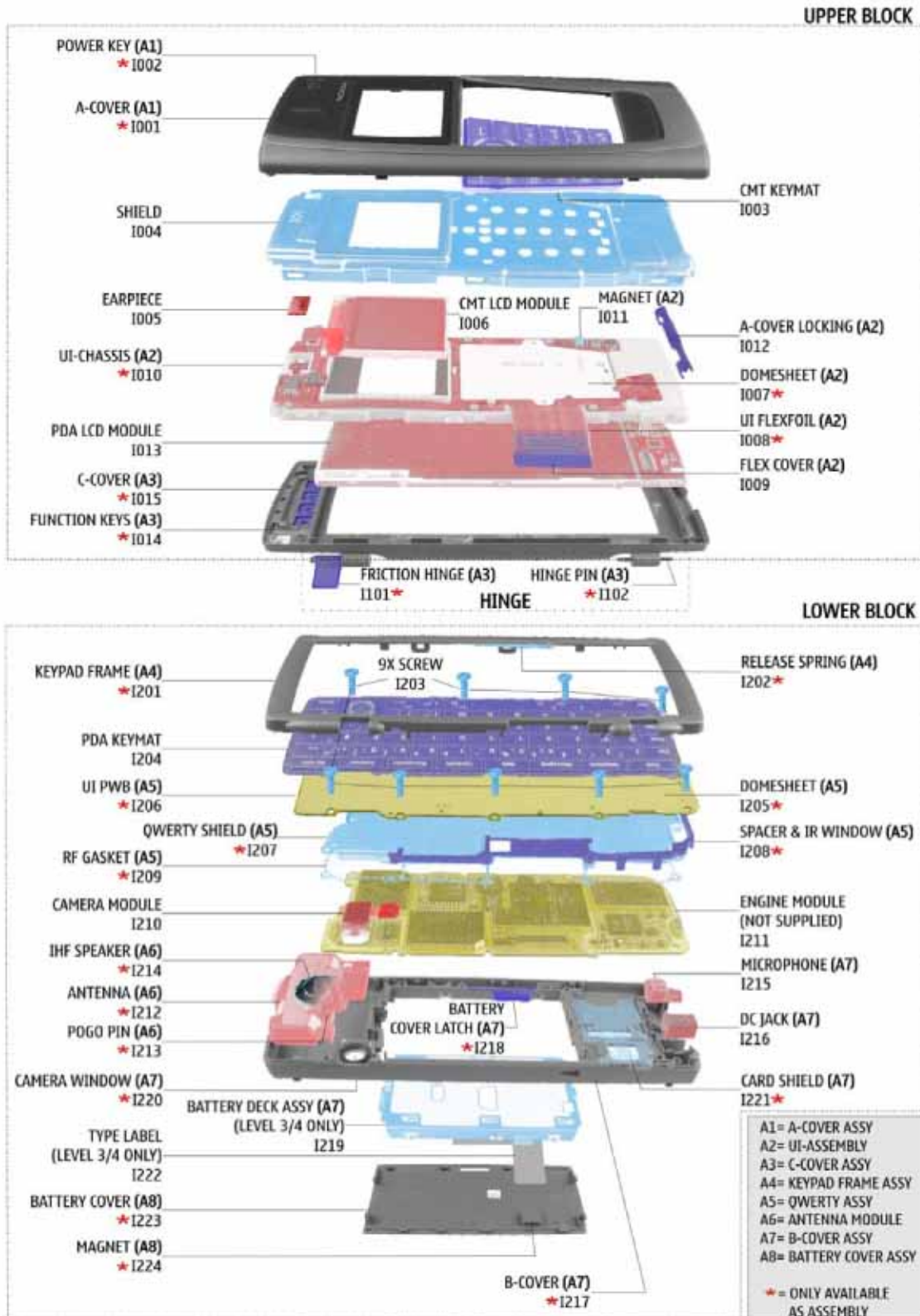


To reduce the server traffic it is recommended to download newest version of huge files like videos, Phoenix packages or Service Manuals only once and distribute it internally for further use.



## 4 EXPLODED VIEW AND COMPONENT DISPOSAL

Recommendation for the ecologically friendly disposal of components. Colorized components show the different categories. See corresponding ITEM/CIRCUIT REF in the Spare Parts Service Bulletins on PWS.




## 5 SPARE PARTS LIST

**Please exchange this page (placeholder) with latest corresponding Service Bulletins (spare parts, SWAP units and service tools) from PWS!**

**This will ensure, that you are using up-to-date order codes only.**

**Therefore Service Bulletins have to be checked from PWS on daily basis.**

## 6 SERVICE TOOLS

	<p><b>FLS-4S incl. ACF-8, Driver and User Guide</b> Dongle and flash device incorporated into one package, developed specifically for POS use.</p>
	<p><b>ACF-8</b> Universal Power Supply is used to power FLS-4S.</p>
	<p><b>Internal Battery BP-5L</b> Inserted under the back cover, this Li-Ion 1300mAh battery provides power in a lightweight package.</p>
	<p><b>Travel Charger ACP-8E (EURO)</b> <b>Travel Charger ACP-8X (UK)</b> Small and lightweight charger for fast charging of your phone battery.</p>
	<p><b>DT-4</b> Desktop stand</p>
	<p><b>Headset HDS-3</b> Stereo headset</p>
	<p><b>CA-28DS</b> Service Cable is used to connect FLS-4S to SF-14.</p>
	<p><b>SF-14</b> POS Flash Adapter is used in POS (Point of Sales) environment for software updating. It provides controlled supply voltage and necessary connections between the phone and the Flash Device. It substitutes for the phone's standard battery during the software update.</p>
	<p><b>SF-14 Test Pins</b> For Flash Adapter SF-14</p>





SS-34  
Flex Opening Tool



RJ-16  
Soldering Jig



Lead-free Solder Wire  
Mandatory for lead-free products.

0772040 NMP Standard Toolkit

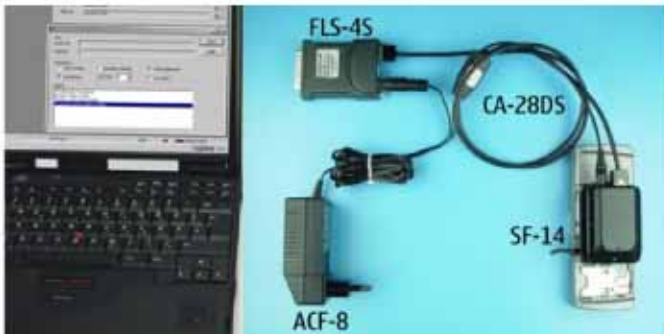


- Nokia opening tool SRT-6 Nokia No. 0770431
- Tonichi torque driver Nokia No. 6901525
- [Hova](#) micro fibre cloth MX304
- [Dastex](#) gloves S, M, XL
- [Artlux](#) goggles AH166
- [Wera](#) bit T5 867/4TX 5x50
- [Wera](#) bit T6 867/4TX 6x50
- [Wera](#) bit T6 PLUS® 867/4TX 6IP
- [Facom](#) side cutter 416E
- [Facom](#) T5 driver SP.14032
- [Facom](#) T6 driver SP.14033
- [Facom](#) slot screwdriver AEF. 2x35.E
- [Wetec](#) tweezers 7abb SA-ESD
- [Wetec](#) tweezers 22 SA-ESD
- [Wetec](#) tweezers 13 SA-SMD ESD
- [Wetec](#) tweezers PSF SA-ESD
- [Wetec](#) ESD brush E1211
- Kaiser [Fototechnik](#) airbrush 6315
- [Wetec](#) dental tool DEM83266/0
- [RS Components](#) Scissors 323-5732

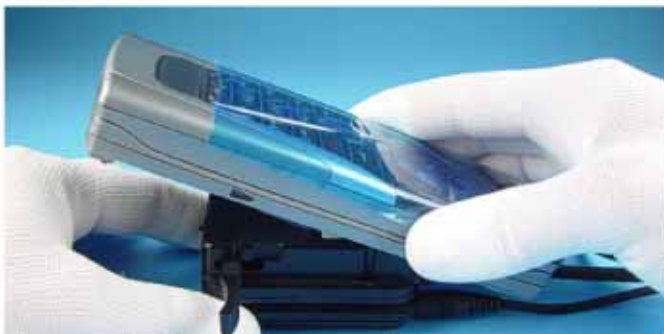
## 7 SW-UPDATE

To use FLS-4S Flash Dongle you have to follow the user guide inside the sales package. Please check always for the latest version of flash software, which is available on Nokia [Partner Web Site](#).

### Flash Concept – (Point of Sales)



**It is very important to follow this insertion and removal procedure, otherwise the contact pins of Flash Adapter could be damaged.**



1.) Insert the Flash Adapter SF-14 like a battery, start at the Battery Connector side.



2.) Now, push down the phone carefully.



3.) First unlock the FLASH ADAPTER and then lift the bottom side of the device.

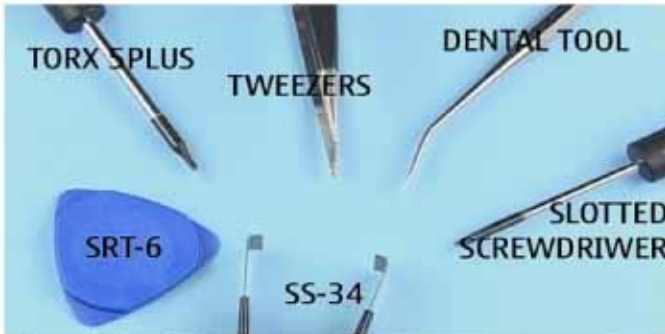


4.) Take away the unit now.



## 8 DISASSEMBLY INSTRUCTIONS (ALSO SEE THE VIDEO CLIPS ON CARE POINT)

### 8.1 LOWER BLOCK



1.) Needed tools for disassembly.



2.) Protect the Window with plastic film.



3.) Push down the BATTERY COVER LATCH before opening the BATTERY COVER.



4.) Fit protective film to the PDA LCD MODULE.



5.) Carefully open the snaps by using the SRT-6.



6.) Unlock the hooks along the edge of the KEYPAD FRAME as shown.



7.) Bend the left side of the KEYPAD FRAME carefully and unlock the snaps as shown.





8.) Place the SRT-6 between KEYPAD FRAME and the B-COVER and open the first snap carefully.



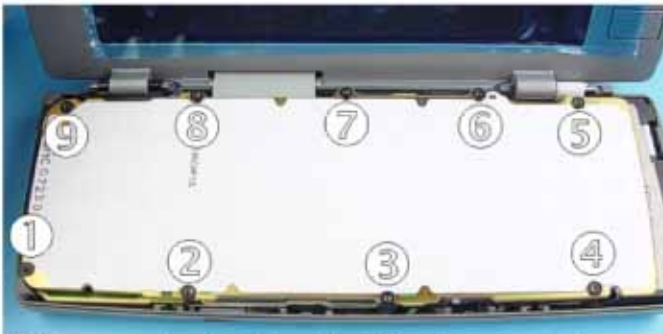
9.) Now, the same procedure when opening the next snap.



10.) Remove the KEYPAD FRAME. **Do not re-use the KEYPAD FRAME!**



11.) Remove the PDA KEYMAT.



12.) Unscrew the nine, Torx Plus® size 5 screws in the order shown. **For assembly, reverse the order and use a Torx Plus® size 5 driver with a torque setting of 18Ncm.**



13.) Now, remove the QWERTY ASSY.

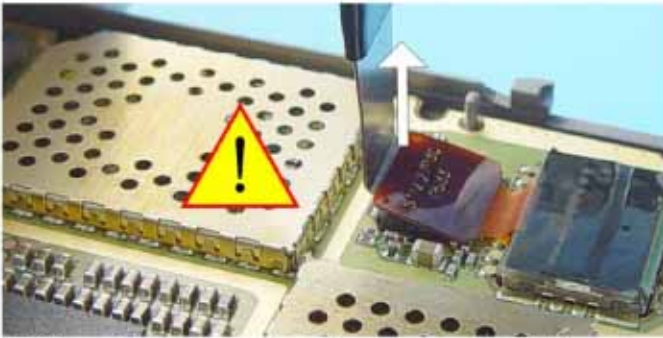


14.) Use the SRT-6 to open the connector. Please note: be careful when opening the connector.



15.) Lift out the UPPER BLOCK.

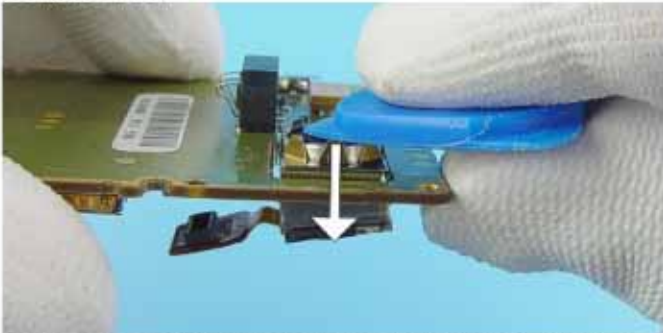




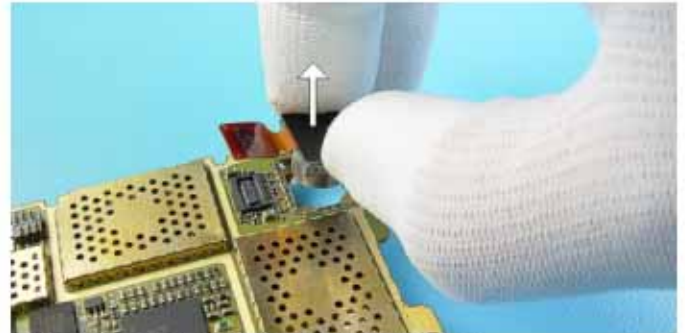
16.) Open the camera connector by using the FLEX OPENING TOOL.



17.) Remove the ENGINE MODULE from the B-COVER.



18.) Use the SRT-6 to push out the CAMERA MODULE from its holder.



19.) Now, take the CAMERA MODULE away.



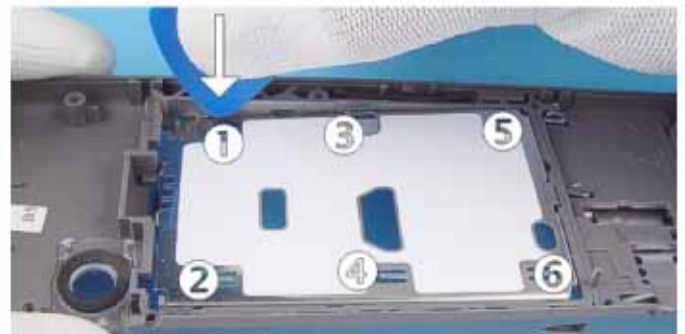
20.) Tweezers can be used to remove the ANTENNA. **Note:** Protect the surface of the ANTENNA. Assemble the ANTENNA ASSY with your fingers only.



21.) Remove the DC-JACK by using the DC-PLUG.



22.) Remove the MICROPHONE with tweezers.



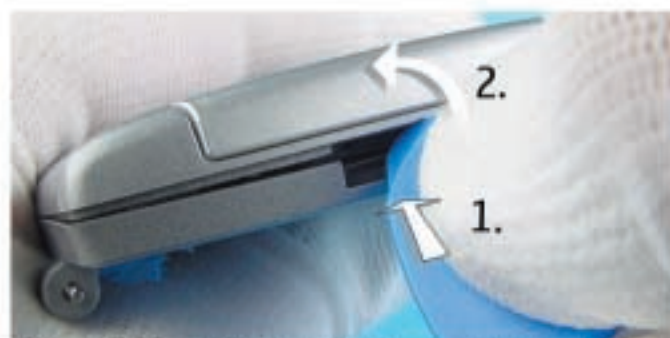
23.) The BATTERY DECK ASSY is attached to the B-COVER with six snaps. Push out the BATTERY DECK ASSY by using the SRT-6.



## 8.2 UPPER BLOCK



1.) Sway the FRICTION HINGE (not available as Spare Part) upward. Please note that the axis is fixed to the C-COVER!



2.) Push in the A-COVER LOCKING by using the SRT-6 and unlock the A-COVER.



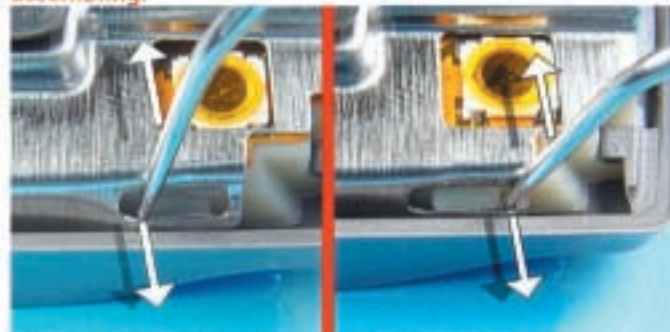
3.) Remove the A-COVER ASSY. Fit protective film to the inside of the A-COVER window.



4.) Remove the CMT KEYMAT. Note the guide pins when assembling.



5.) The dental tool can be used to bend open the flaps of the SHIELD.



6.) Please note: To prevent injuring yourself always place the device on the table when opening the flaps. Use always a new SHIELD when re-assembling.



7.) Remove the SHIELD.

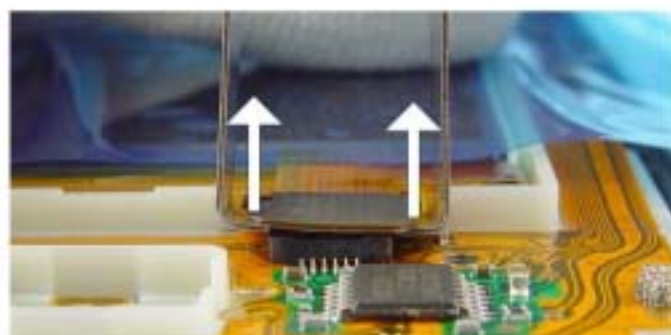


8.) Please take care of the EARPIECE. Protect the CMT LCD MODULE with a film.

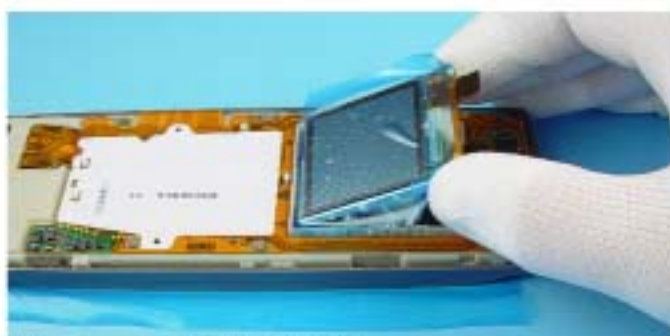




9.) Tweezers can be used to remove the EARPIECE.



10.) Open the LCD connector by using the SS-34.



11.) Take away the LCD MODULE.



12.) Use the SRT-6 as a lever to open the A-COVER LOCKING.



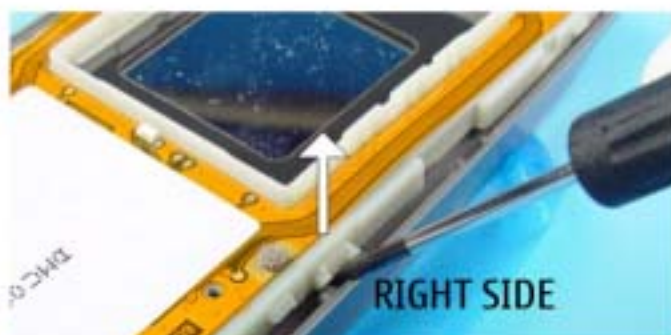
13.) Take away the A-COVER LOCKING.



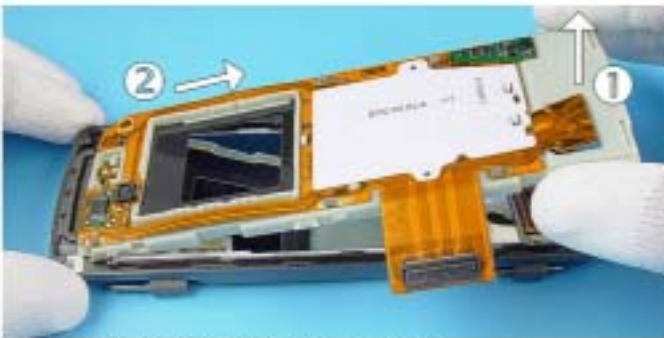
14.) Open the connector by using the SRT-6.



15.) Use a slotted screwdriver as a lever to open the clip.



16.) The same procedure on the right side.

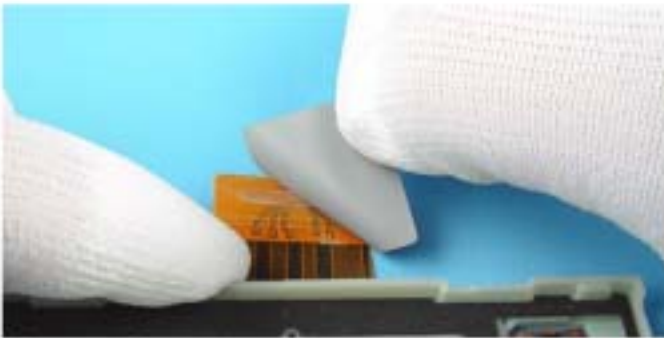


17.) Take out the UI-CHASSIS as shown.

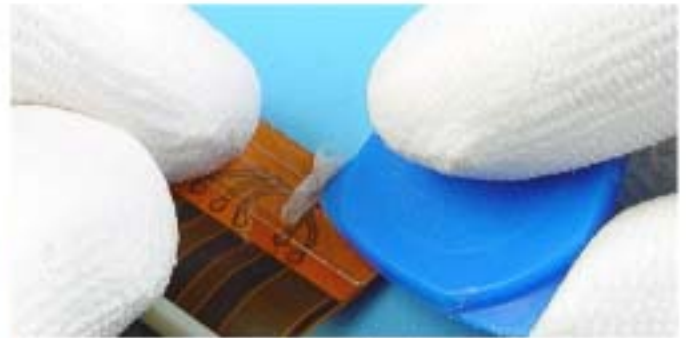


18.) The PDA LCD MODULE is attached with an adhesive tape to the C-COVER. Press out the LCD MODULE slowly and the adhesive will peel away.

## 9 EXCHANGE OF FLEX COVER



1.) Remove the FLEX COVER.



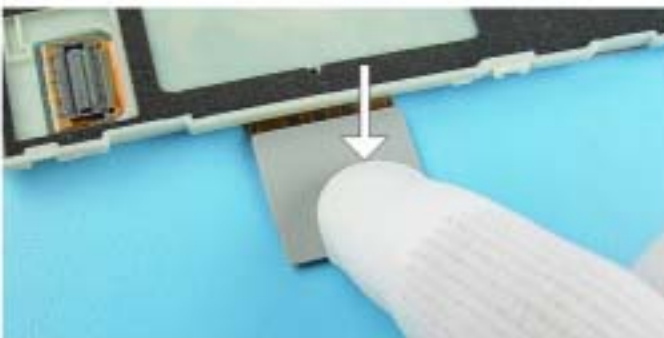
2.) To remove the remaining adhesive use SRT-6.



3.) Take the new FLEX COVER by using tweezers...



4.) ... and place it on the UI-FLEXFOIL exactly.



5.) Press the FLEX COVER to UI-FLEXFOIL carefully.



## 10 KEYPAD FRAME ASSEMBLY

Always use a new **KEYPAD FRAME ASSY** when assembling.



1.) Place the PDA KEYMAT on the QWERTY ASSY. Note the guide pins.



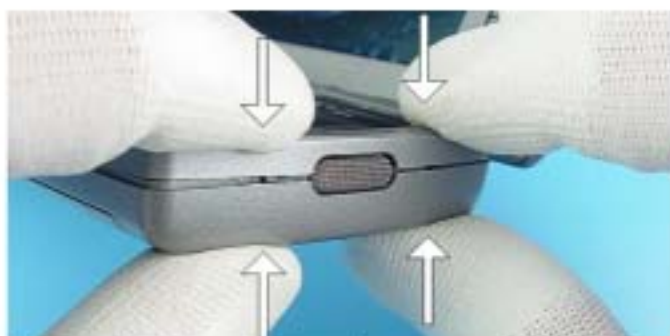
2.) Always start with the left side of the QWERTY FRAME when assembling the unit.



3.) Press on the upper side of the QWERTY FRAME carefully.



4.) Note that the booth snaps on the front side are correct locked.

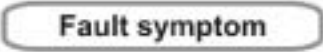







5.) Press the both COVERS together.

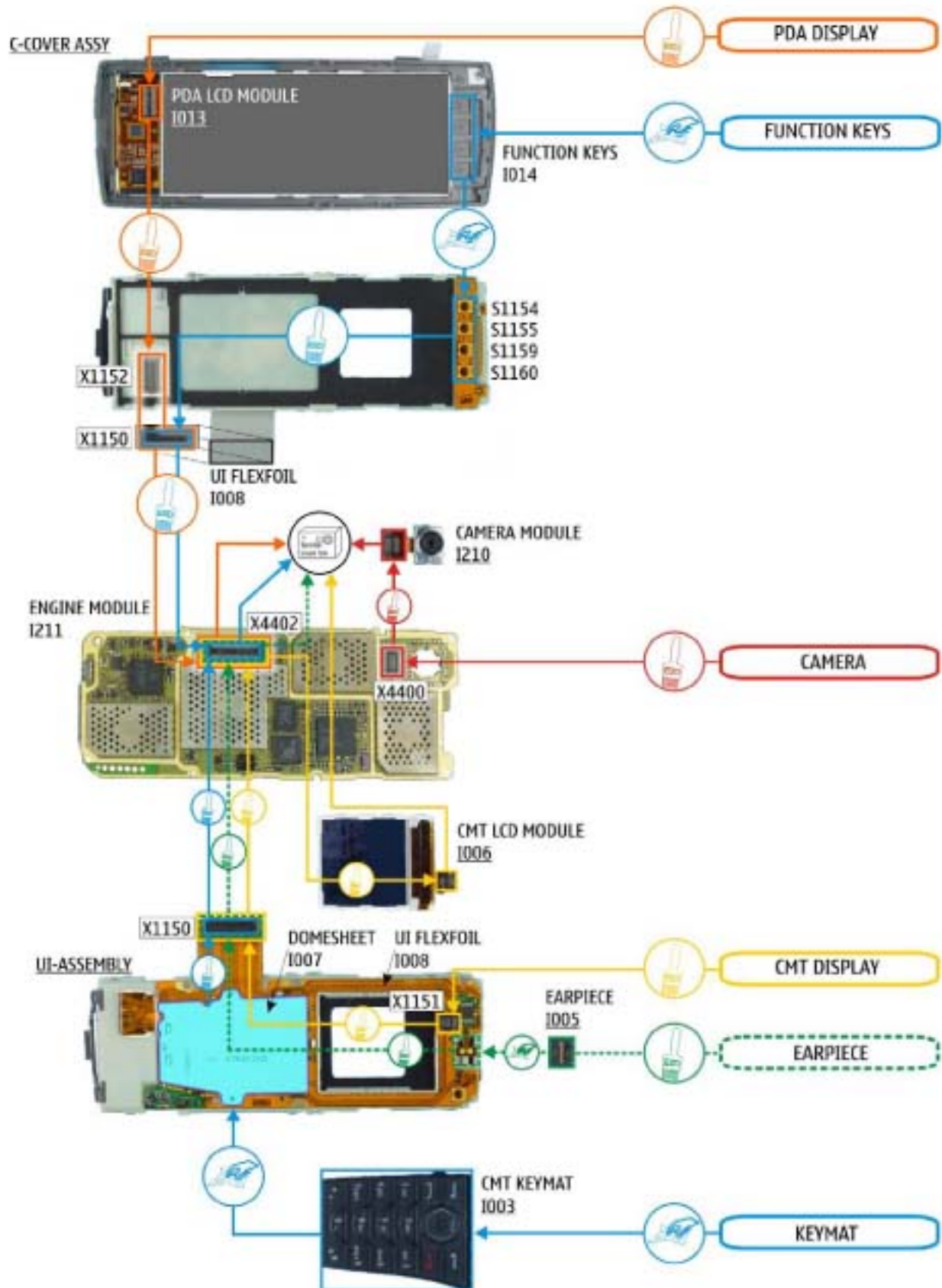


## 11 LEGEND FOR QUICK TROUBLE SHOOTER

This legend is valid for all parts of the Quick Trouble Shooter

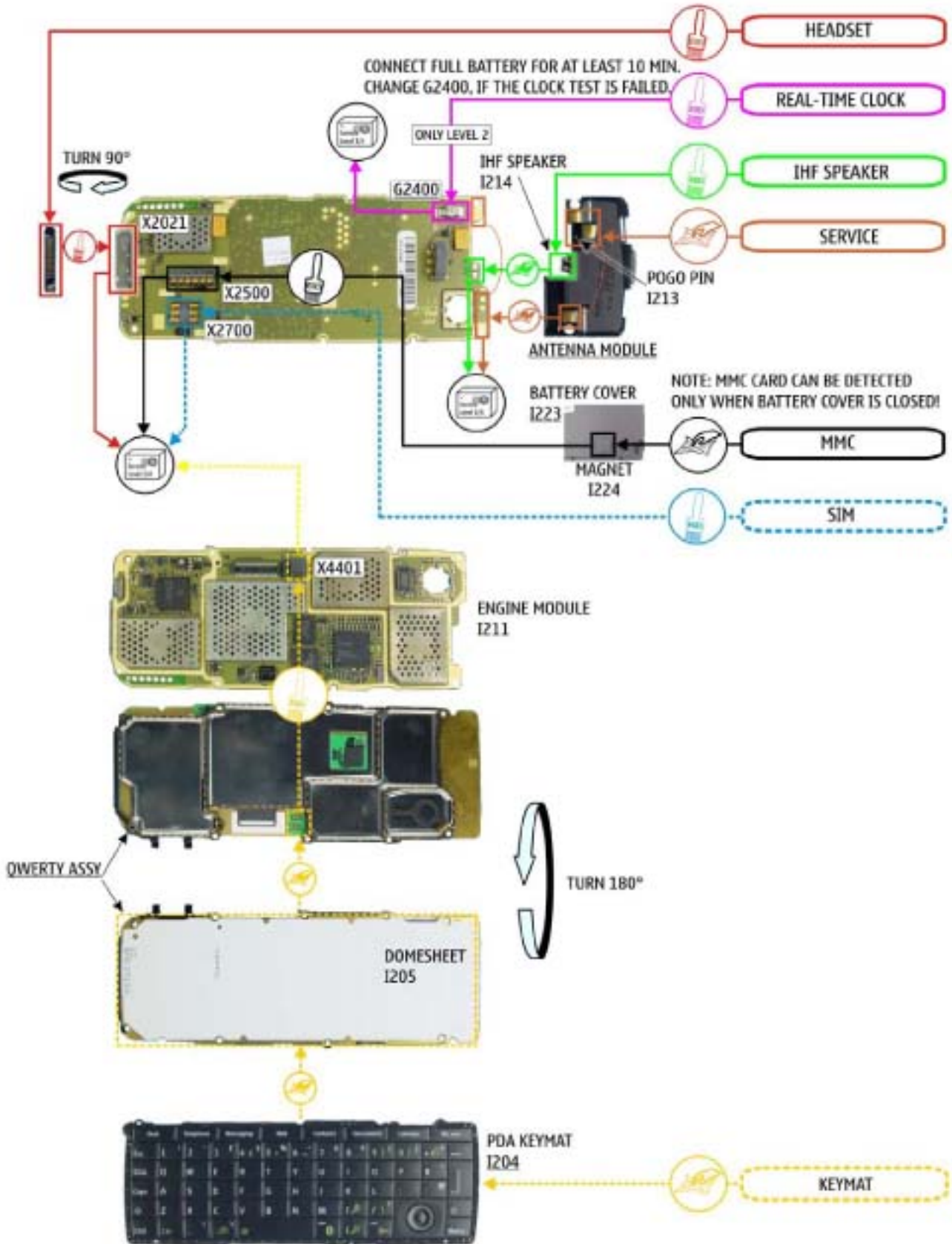
<p>Follow the steps until the problem is solved. If this doesn't help, you are not authorized to go forward. Only underlined components ( e.g. <u>1002</u>) can be changed.</p>	
	<p>The start point of repair activities regarding the appeared fault symptoms.</p>
	<p>Follow the arrows step by step</p>
	<p>Pads or contacts: Check optical and mechanical condition particularly regarding to corrosion. Clean if necessary.</p>
	<p>Measure component for electrical functionality and change, if needed.                  (Level 2 only)</p>
	<p>Pads or contacts: Check optical and mechanical condition particularly regarding to corrosion. Clean with ESD brush only, if necessary.</p>
	<p>No more actions possible send product to the appropriate service supplier with higher service level.</p>

## 12 QUICK TROUBLE SHOOTER PART 1

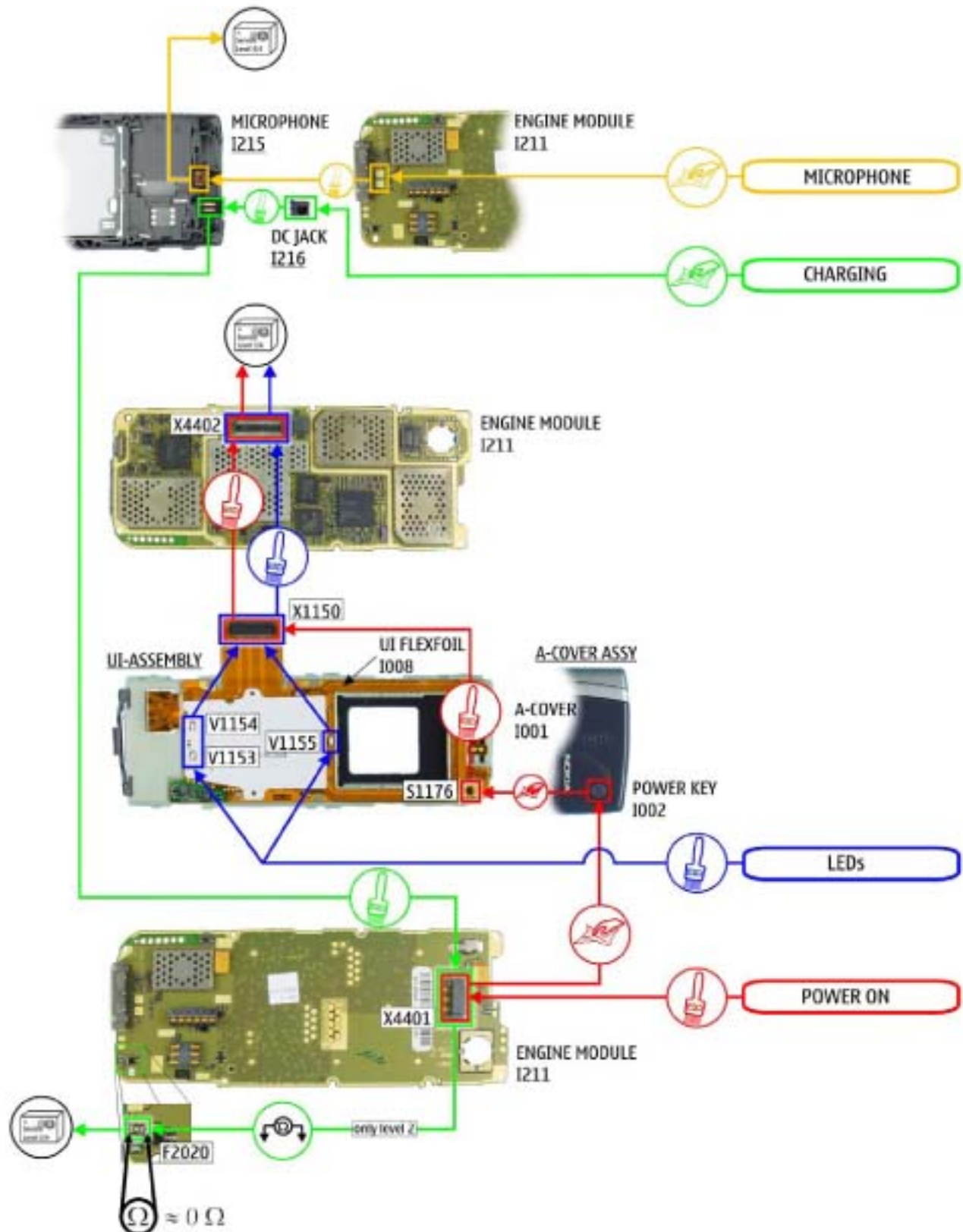




**13 QUICK TROUBLE SHOOTER PART 2**



### 14 QUICK TROUBLE SHOOTER PART 3








## 15 CAMERA GONOGO TEST

Before starting the GoNoGo test, check that camera window is clean. If not, clean the window with cloth.



- From home menu press the menu key  (upper key)
- To take a picture press the menu key: **Capture**  (middle key)
- Test was successful, if the image appears on your display. The camera is ok.
- Select **Delete**  (middle key)
- Select **Yes**
- Select **Exit** for home menu
- If the test is failed see Quick Trouble Shooter.

## 16 BLUETOOTH & INFRARED TEST

### Bluetooth test

You need another Bluetooth device (e.g. 6310i) to do a GoNoGo test.

Make sure that Bluetooth is activated in the reference unit. The distance of the devices should be not more than 5m from each other.

### Infrared test

You need another infrared device (e.g. 6310i) to do a GoNoGo test. The infrared windows of the devices must be directed to each other and should have a distance of approximate 15 cm. Make sure that infrared is activated in receiver device.

**Warning:** Do not point the IR (infrared) beam at anyone's eye or allow it to interfere with other IR devices. This device is a Class 1 Laser product.



Reference unit, Bluetooth /infrared

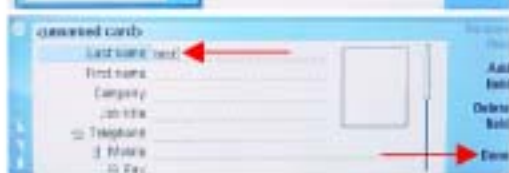


activated Test unit

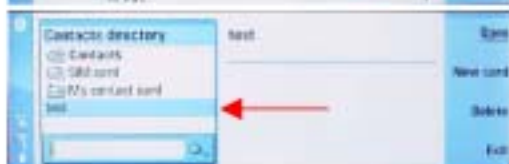
Settings on the test unit:



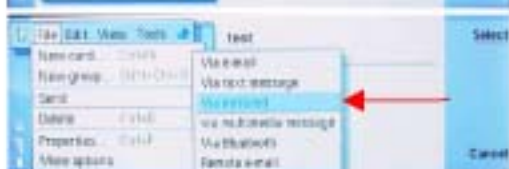
From Desk Menu select **Contacts**.  
 In Contacts directory select My contacts card and select New card.



Create one new contact. Type for e.g. "test" and acknowledge it with Done.



Select your entry "test" and press the **Menu** key.



For infrared test: Select: File-->Send-->Via infrared  
 If sending of business card fails, make sure again that infrared windows are directed to each other and infrared is activated in reference device. Then try again sending. Test was successful, if you get a message on receiver device.



For Bluetooth test: Select: File-->Send--> Via Bluetooth  
 Activate Bluetooth if not already done.  
 Search window appears, if all Bluetooth devices in range will be displayed, the test is successful!  
**Note: Bluetooth is activated!**



## 17 GONOGO TEST

After the optical check a GoNoGo test has to be carried out if the unit has been unscrewed to guarantee the functionality of the phone.

Please refer to the actual information on Partner Web Site and Nokia Care Point. When using delivered tester support files, take care of the right setup according to the tester type and product type. Please refer to "Recommended Service Equipment" on Nokia Partner Web Site.



Mobile Phone Tester

## 18 BATTERY TEST

A battery tester lets you test the capacity of Nokia batteries.

Please refer to the actual information on Partner Web Site.



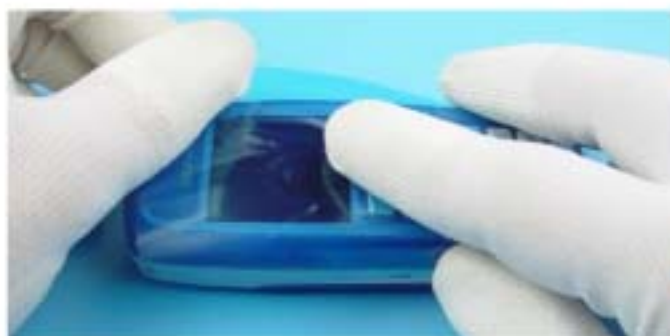
<http://www.astratec.co.uk/>



<http://www.cadex.com/>

## 19 FOR FORWARDING OF REPAIRS

When it is necessary to forward of repairs to appropriate service supplier with higher service level we recommend using the offered swap phone cartons as described in Spare Parts SB-004.



Always Protect the window with a protection film.



Put the unit under the stretch film.



Add repair documentation e.g. filled-in service note into the swap carton.



Fold the swap carton as shown in Spare Parts SB-004.

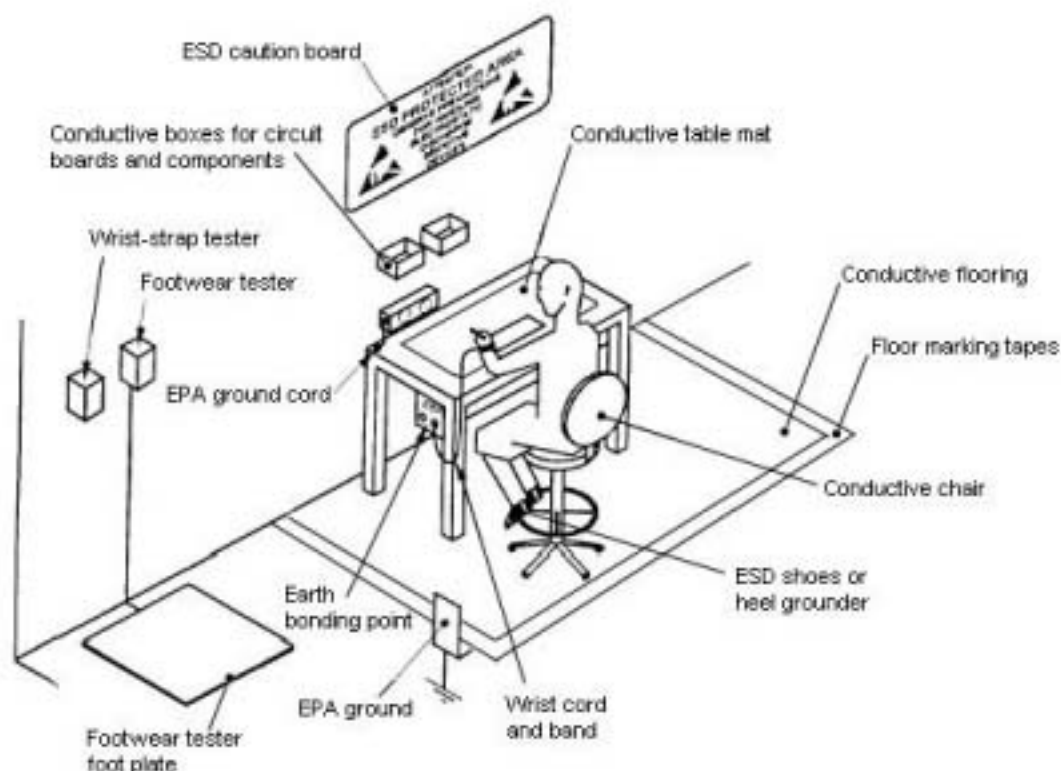


There are two different sizes of swap cartons for common mobile phones.



## 20 ESD PROTECTION REQUIREMENTS

Please refer to the Partner Web Site document  
[Service Supplier Requirements](#) in folder General Instructions.



- USE Conductive bags and boxes
- USE ESD compatible service tools
- USE Conductive wastebaskets
- USE ESD gloves when handling PWBs/PCBs
- USE Cleaning material without changing el. Characteristics
- USE Grounded service equipment, i.e. soldering station
- USE ESD clothes such as coat or frock

- NO Smoking
- NO Drinking
- NO Eating
- NO Dust
- NO Useless Items
- NO Normal pressured air for cleaning modules/displays



The video covers general issues concerning Electro-Static Discharge (ESD)  
 source: Nokia Care Point