CMO Operations & Logistics
WW Service Solutions & Development
Bochum / Germany   CONFIDENTIAL   17.3.2005

NOKIA
6021
RM-94

Transceiver characteristics:

- GSM triband 900/1800/1900 (EGSM)

- Bluetooth

- Color display: 27.5mmx 27.5mm active size, 65 k colors, high resolution 128x128 active matrix

- Keymat with 5(9)-way navigation key

- Monoblock design with user changeable front and back covers

- Integrated handsfree speaker

- Push-to-talk function

- Pop-port connector, IrDa

- GPRS (Class 10) 3+2, 4+1, EGPRS (Class 6) 3+1, 2+2

- Ringing volume: ~100 dB from 5cm distance

- WAP 2.0 – xHTML over TCP/IP stack.

Transceiver with BL-5B 760mAh Li-Ion battery pack

Talk time	Standby	Note
Up to 3h	Up to 11days	Depends on network parameters

Environmental characteristics:

- Lead-free soldered

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

SERVICE MANUAL

Service Level 1&2

CM0 Operations & Logistics   MGR
WW Service Solutions & Development
Bochum / Germany   CONFIDENTIAL   17.3.2005

TABLE OF CONTENT

Page

CHANGE HISTORY

Status	Version No.	Date	Comments
Draft	0.1	10.03.2005	Initial draft
Approved	1.0	17.03.2005	Approval

NOKIA

CONNECTING PEOPLE

PAGE 3 (22)   Approved 1.0

CMO Operations & Logistics   MGR
WW Service Solutions & Development
Bochum / Germany   CONFIDENTIAL   17.3.2005

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.
5. 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 Online. Also see ESD Protection Requirements in this Service Manual.

NOKIA
CONNECTING PEOPLE

PAGE 4 (22)   Approved 1.0

CMO Operations & Logistics   MGR
WW Service Solutions & Development
Bochum / Germany   CONFIDENTIAL   17.3.2005

2. GENERAL REPAIR INFORMATION

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

o   To familiarize oneself with NOKIA product read the tutorials or user guide on www.NOKIA.com -->Support--> Phones, by selecting the Phone Model.
o   Before starting the repair you must take care of ESD precautions like being in your ESD Protected Area and connecting your wristband.
o   Use gloves to avoid corrosion and fingerprints.
o   Protect windows and displays with a film to avoid dust and scratches.
o   When cleaning the LCD Module any lint-free cloth can be used (e.g. Micro-Fibre cloth).
o   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.
o   Mechanical parts (except shielding lids and bent parts), which didn't repair the failure, can be reused, if they are not soldered.
o   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.
o   Always use original NOKIA spare parts.
o   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).
o   Remove redundant soldering flux after repair.
o   Meet the torque requirements when assembling the unit (see also the document "torques for transceiver assembly" on NOKIA Partner Web Site/NOKIA Online).
o   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.
o   A SIM card is needed for all GoNoGo tests.
o   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.
o   Please be aware that some malfunctions could be software related and solved by an update.

o   There are several documents available on NOL, which have to be followed:

o   First, take care for the latest content pages of Service Bulletins, which are always available for each folder on NOKIA Online. This is also important to recognize, if existing documents have become invalid.

o   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 Software Service Bulletins**
    etc,…

Use General SB-217 as a reference or overview.

Please also check NOKIA Online (NOL) for latest news and files on a regular basis.

NOKIA
CONNECTING PEOPLE

PAGE 5 (22)   Approved 1.0

CMO Operations & Logistics   MGR
WW Service Solutions & Development
Bochum / Germany   CONFIDENTIAL   17.3.2005

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 Online with the purpose of serving different multimedia content, like video clips or interactive tutorials.

It is mandatory to watch for newest technical and organizational information on a daily basis to be updated as required (see **"Latest files in Support Library"**). Every new information has to be processed and implemented as soon as possible.
When logged into NOL you can also find needed information in different folder like:

Support Library

Phones

Service Manuals
Service Bulletins
Software
Repair Information

Level 1&2 e-learning (former NOKIA CarePoint) on NOKIA Online

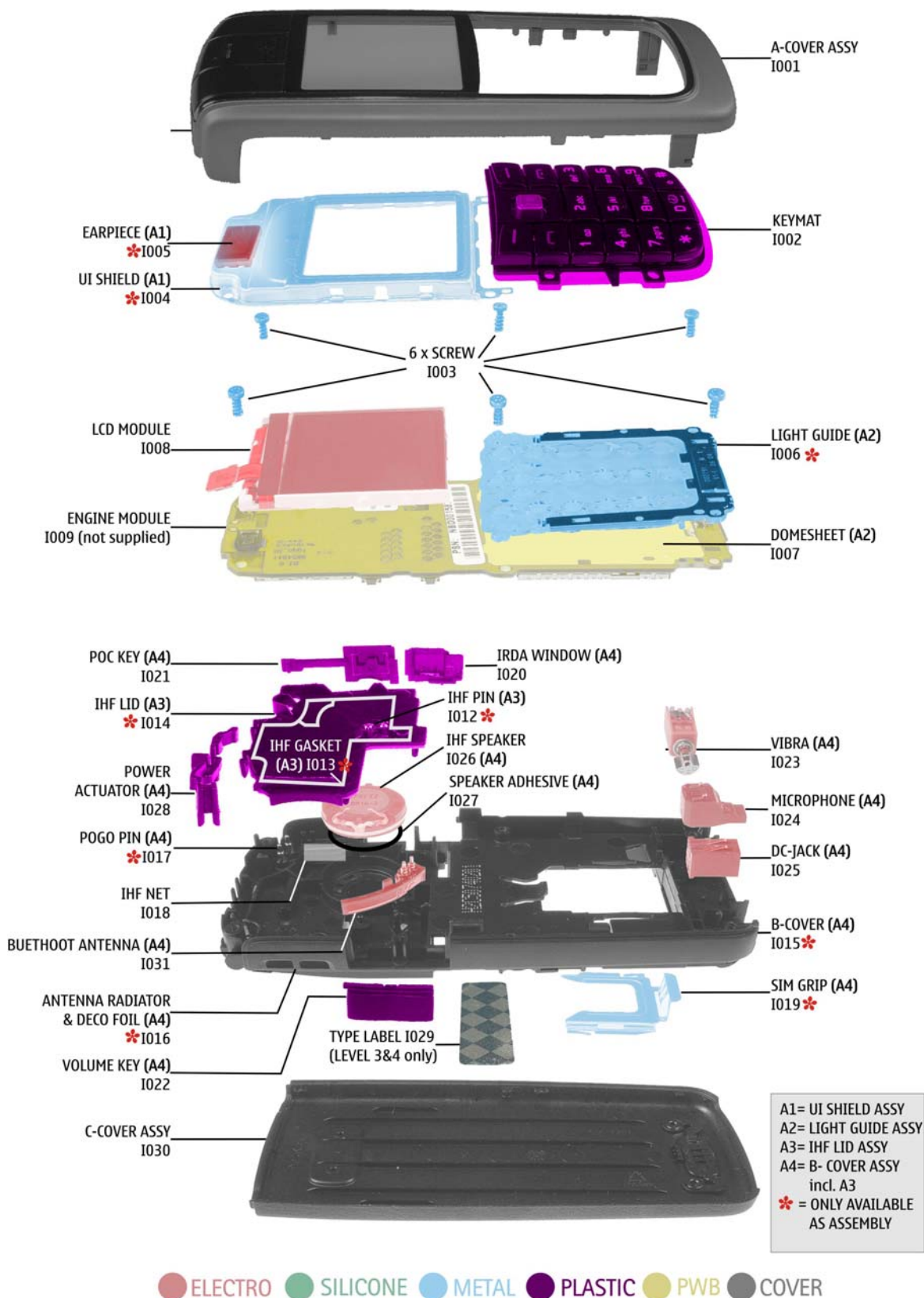| Former NOKIA CarePoint content, such as	• **Online Troubleshooting** • **Product informations** • **Videos – Disassembly/Assembly**	can be found on **NOKIA Online**
		NOKIA Online **Care Services** **Training** **Phone Models**

Level 1&2 e-learning courses offer a quick overview of the NOKIA phone and support for how to repair and use the phone:

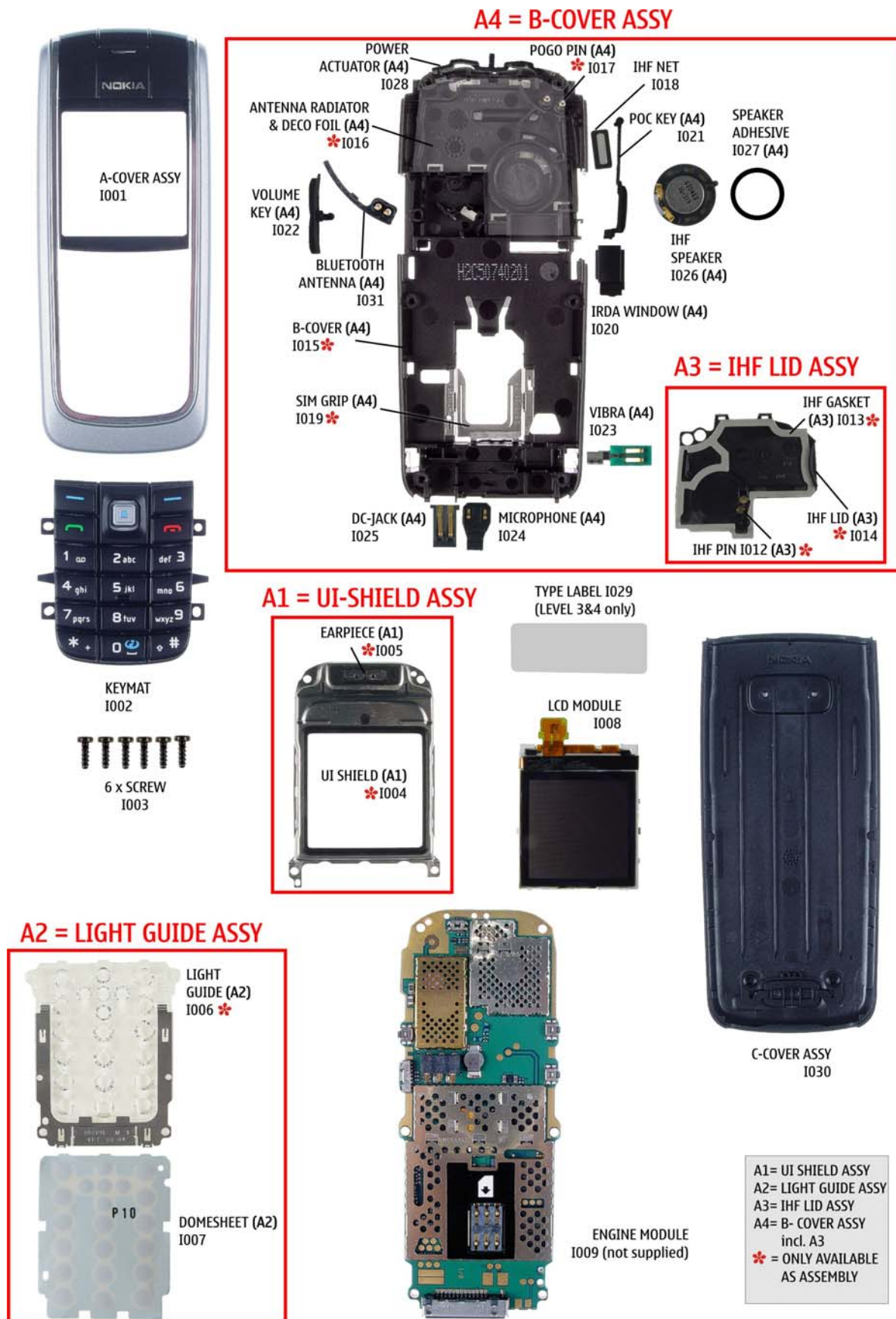| Overview & Guides	Disassembly & Assembly	Troubleshooting
Basic information about the phone, features and technologies	Instructions to disassemble and assemble the phone	Step-by-step instructions on how to locate and repair the most common problems with the phone

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.

NOKIA
CONNECTING PEOPLE

CMO Operations & Logistics
WW Service Solutions & Development
Bochum / Germany

PAGE 6 (22)

CONFIDENTIAL

Approved 1.0
MGR

17.3.2005

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 NOL.

A-COVER ASSY
I001

EARPIECE (A1)
*I005

UI SHIELD (A1)
*I004

KEYMAT
I002

6 x SCREW
I003

LCD MODULE
I008

LIGHT GUIDE (A2)
I006 *

ENGINE MODULE
I009 (not supplied)

DOMESHEET (A2)
I007

POC KEY (A4)
I021

IRDA WINDOW (A4)
I020

IHF LID (A3)
*I014

IHF PIN (A3)
I012 *

IHF GASKET
(A3) I013 *

IHF SPEAKER
I026 (A4)

VIBRA (A4)
I023

POWER
ACTUATOR (A4)
I028

SPEAKER ADHESIVE (A4)
I027

MICROPHONE (A4)
I024

POGO PIN (A4)
*I017

DC-JACK (A4)
I025

IHF NET
I018

BUETHOOT ANTENNA (A4)
I031

B-COVER (A4)
I015*

ANTENNA RADIATOR
& DECO FOIL (A4)
*I016

SIM GRIP (A4)
I019*

VOLUME KEY (A4)
I022

TYPE LABEL I029
(LEVEL 3&4 only)

C-COVER ASSY
I030

A1= UI SHIELD ASSY
A2= LIGHT GUIDE ASSY
A3= IHF LID ASSY
A4= B- COVER ASSY
    incl. A3
* = ONLY AVAILABLE
    AS ASSEMBLY

●ELECTRO ●SILICONE ●METAL ●PLASTIC ●PWB ●COVER

NOKIA
CONNECTING PEOPLE

5. SPARE PARTS OVERVIEW

A4 = B-COVER ASSY

POWER ACTUATOR (A4) I028
POGO PIN (A4) *I017
IHF NET I018
ANTENNA RADIATOR & DECO FOIL (A4) *I016
POC KEY (A4) I021
SPEAKER ADHESIVE I027 (A4)
VOLUME KEY (A4) I022
BLUETOOTH ANTENNA (A4) I031
IHF SPEAKER I026 (A4)
B-COVER (A4) I015*
IRDA WINDOW (A4) I020
SIM GRIP (A4) I019*
VIBRA (A4) I023
DC-JACK (A4) I025
MICROPHONE (A4) I024

A-COVER ASSY I001

A3 = IHF LID ASSY

IHF GASKET (A3) I013*
IHF LID (A3) *I014
IHF PIN I012 (A3) *

KEYMAT I002

6 x SCREW I003

A1 = UI-SHIELD ASSY

EARPIECE (A1) *I005
UI SHIELD (A1) *I004

TYPE LABEL I029 (LEVEL 3&4 only)

LCD MODULE I008

A2 = LIGHT GUIDE ASSY

LIGHT GUIDE (A2) I006 *
DOMESHEET (A2) I007
P 10

ENGINE MODULE I009 (not supplied)

C-COVER ASSY I030

A1= UI SHIELD ASSY
A2= LIGHT GUIDE ASSY
A3= IHF LID ASSY
A4= B- COVER ASSY incl. A3
* = ONLY AVAILABLE AS ASSEMBLY

NOKIA
CONNECTING PEOPLE

CMO Operations & Logistics   MGR
WW Service Solutions & Development
Bochum / Germany   CONFIDENTIAL   17.3.2005

6. SPARE PARTS LIST

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

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

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

NOKIA
CONNECTING PEOPLE

7. SERVICE TOOLS

	FLS-4S incl. ACF-8, Driver and User Guide Dongle and flash device incorporated into one package, developed specifically for POS use.
	ACF-8 Universal Power Supply is used to power FLS-4S.
	Internal Battery BL-5B Inserted under the back cover, this Li-Ion 760 mAh battery provides power in a lightweight package.
	Travel Charger ACP-12 Small and lightweight charger for fast charging of your phone battery.
	Headset HS-5 An easy and convenient handsfree solution with remote control.
	XCS-1 Service Cable is used to connect FLS-4S to **SF-17** .
	SF-17 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.

CMO Operations & Logistics
WW Service Solutions & Development
Bochum / Germany

MGR

CONFIDENTIAL

17.3.2005

	Test Pins for Flash Adapter **SF-17**
	RJ-66 Soldering Jig
	Lead-free Solder Wire Mandatory for lead-free products (Level 2 only).

0772040   NMP Standard Toolkit

- NOKIA opening tool SRT-6 NOKIA No. 0770431
- Tonichi torque driver NOKIA No. 6901525
- Hoya micro fibre cloth MX304
- Dastex gloves S, M, XL
- Artilux goggles AH166
- Wera bit T5 867/4TX 5x50
- Wera 867/4 6IP; 50mm (Torx 6 PLUS®)
- Wera bit T6 867/4TX 6x50
- Wera 867/1 5IP; 25mm (Torx 5 PLUS®)
- 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

8. 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 Online.

Flash Concept – (Point of Sales)
It is very important to follow this insertion and removal procedure, otherwise the contact pins of Flash Adapter will be damaged.

Insert the Flash Adapter SF-17 like a battery, start at the Battery Connector side.

Now, push down the bottom side of the phone, do not use too much force.

When removing the phone, always start with the reverse.

9. DISASSEMBLY INSTRUCTIONS

1.) Needed tools for disassembly.

2.) Protect the Window with a protective film.
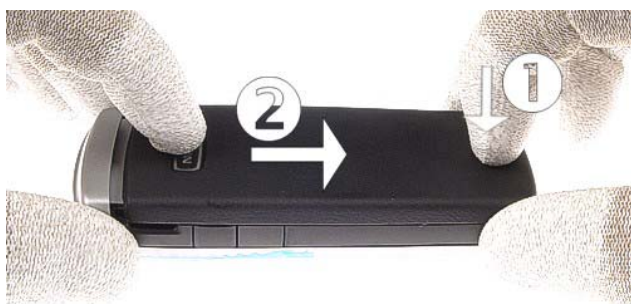
3.) Remove the **C-Cover** and protect the **Camera Window**.

4.) Unlock the side snaps with **SRT-6** when opening the **A-Cover**.

5.) Also protect the inner side of the Window with a protective film.

6.) Remove the **Keymat**.
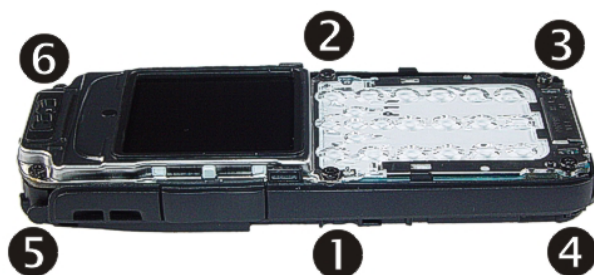
7.) Unscrew the six **Torx Plus®** size 6 screws. For assembly, the reverse order and a **Torx Plus®** driver with a torque of 28Ncm has to be used.
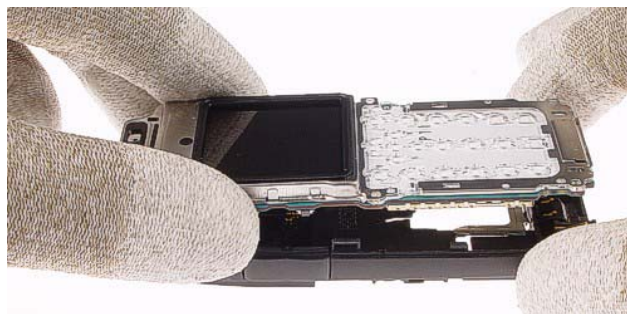
8.) Take the **Engine Module** from the **B-Cover**.
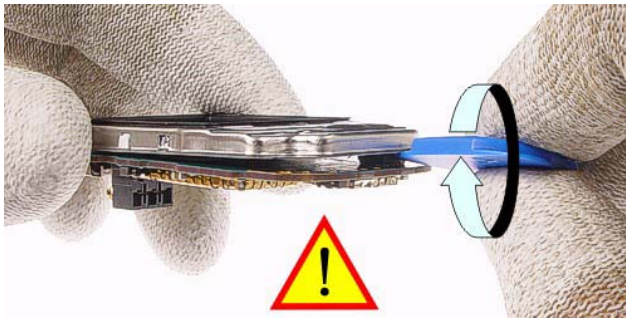
9.) Carefully open the **LCD** connector. Do not to damage the **LCD** connector.
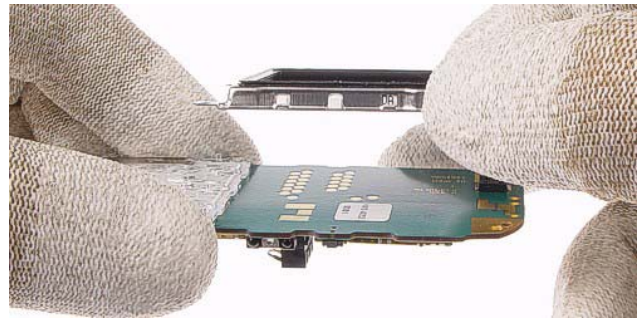
10.) Remove **UI Shield Assy** with the **LCD Module**.

11.) Lever out the **LCD Module** from the **UI Shield**.

12.) Protect the **LCD Module** with a protective film.
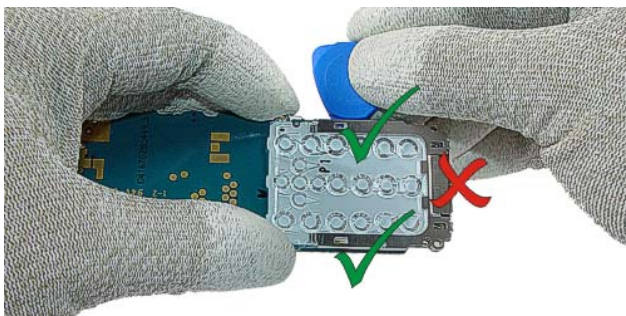
13.) Separate the **Light Guide Assy** from the **Engine Module**. Do not use the **SRT-6** on the right side to avoid damaging underneath components.
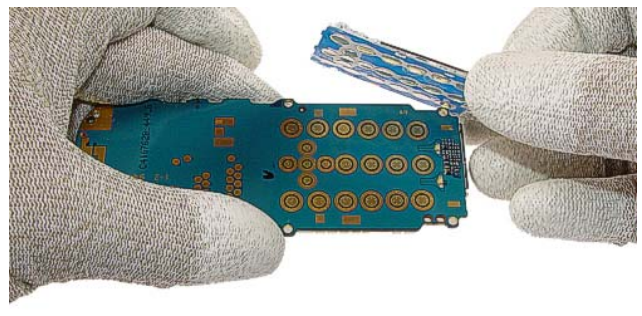
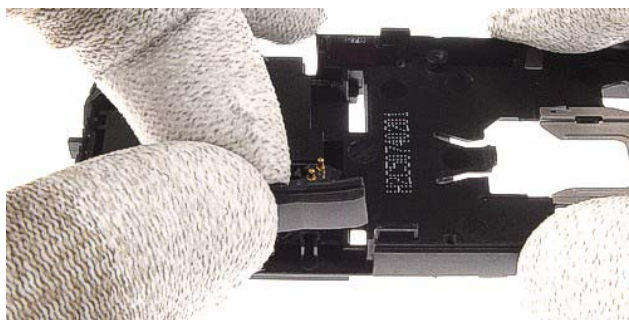14.) Now, take away the **Light Guide Assy**.

15.) Remove the **DC-Jack** with a DC-Plug.

16.) Remove the **Microphone** with tweezers.

17.3.2005

17.) Lever out the **Vibra Motor**.
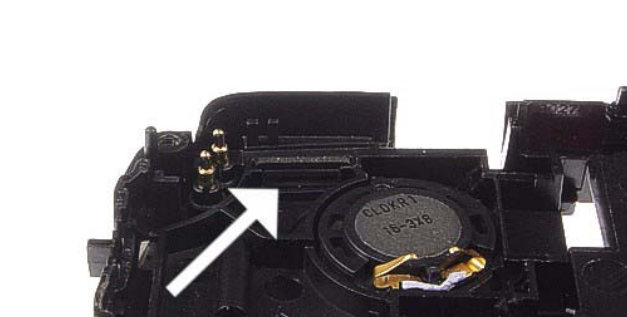

18.) Remove the **POC Key**.
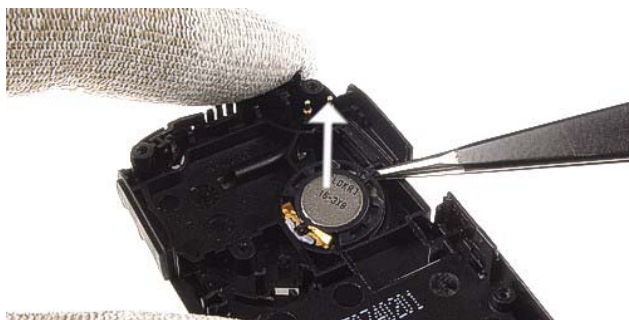

19.) Remove the **Volume Key.**

20.) Remove the **Bluetooth Antenna** with tweezers.
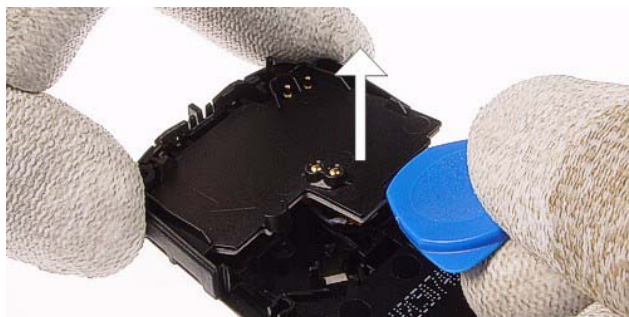
21.) First unlock this side of the **IHF Lid** with **SRT-6**.


22.) Note, that the **IHF Net** stays in place during disassembly.

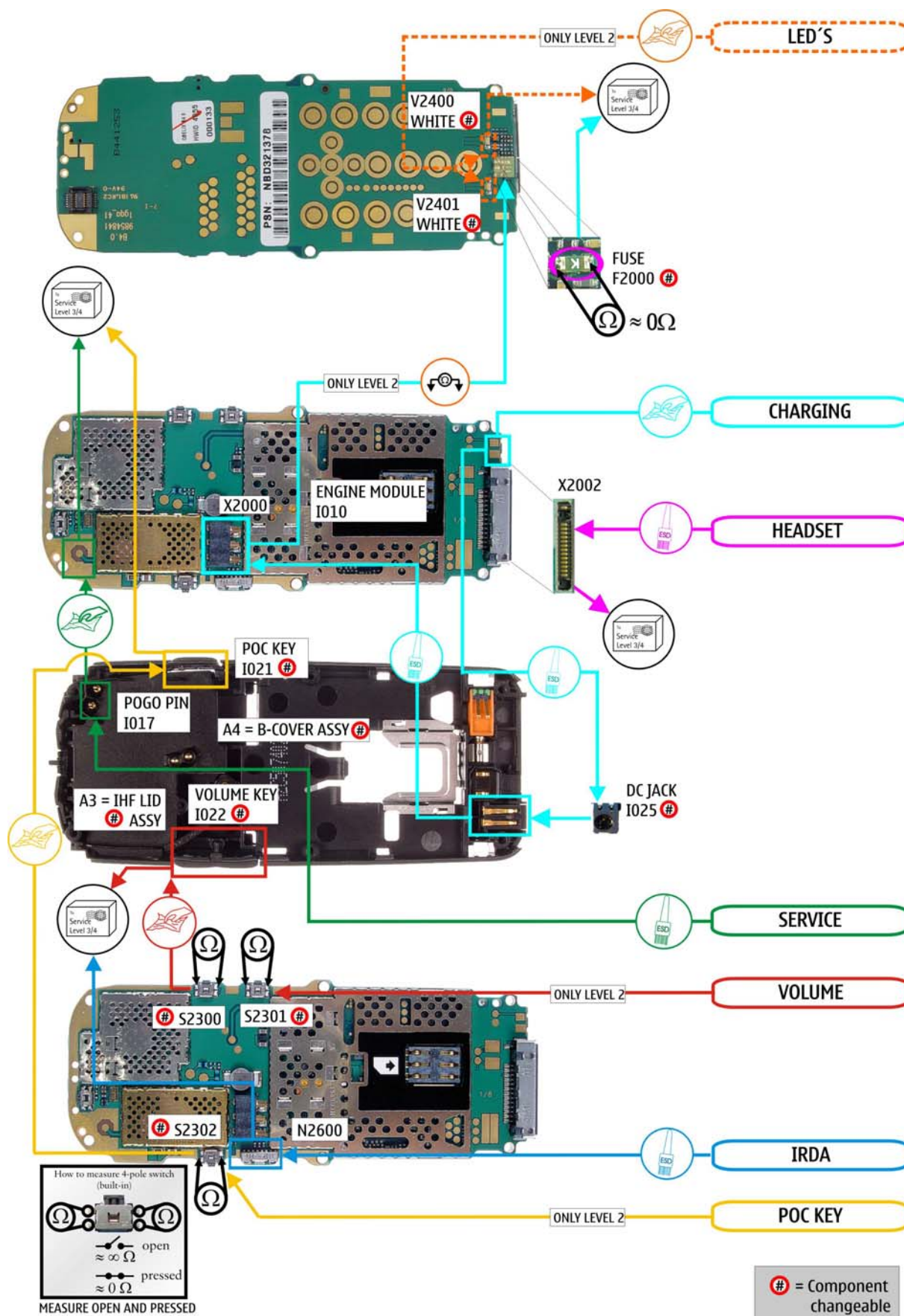

23.) Release the **IHF Speaker** carefully with a slotted screwdriver. Always use a new **Speaker Adhesive** when assembling.

CMO Operations & Logistics
MGR
WW Service Solutions & Development
Bochum / Germany
CONFIDENTIAL
17.3.2005

10. LEGEND FOR QUICK TROUBLE SHOOTER

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

Follow the steps until the problem is solved. If this doesn't help, you are not authorized to go forward.	
	Only marked components (e.g. I002) can be changed.
Fault symptom	The start point of repair activities regarding the appeared fault symptoms.
→	Follow the arrows step by step
	Pads or contacts: Check optical and mechanical condition particularly regarding to corrosion. Clean if necessary.
	Measure component for electrical functionality and change, if needed. (Level 2 only)
	Pads or contacts: Check optical and mechanical condition particularly regarding to corrosion. Clean with ESD brush only, if necessary.
	No more actions possible send product to the appropriate service supplier with higher service level.

NOKIA
CONNECTING PEOPLE

11. QUICK TROUBLE SHOOTER PART 1

LED´S

ONLY LEVEL 2

V2400 WHITE #
V2401 WHITE #

FUSE F2000 #

$\approx 0\Omega$

Service Level 3/4

ONLY LEVEL 2

CHARGING

ENGINE MODULE I010

X2000   X2002

HEADSET

Service Level 3/4

POC KEY I021 #

POGO PIN I017

A4 = B-COVER ASSY #

DC JACK I025 #

A3 = IHF LID # ASSY   VOLUME KEY I022 #

SERVICE

Service Level 3/4

VOLUME

ONLY LEVEL 2

S2300   S2301

S2302   N2600

IRDA

POC KEY

ONLY LEVEL 2

How to measure 4-pole switch (built-in)

$\approx \infty \Omega$ open
$\approx 0 \Omega$ pressed

MEASURE OPEN AND PRESSED
STATE ON BOTH SIDES OF SWITCH

= Component changeable

12. QUICK TROUBLE SHOOTER PART 2

B3 = IHF LID
# ASSY

IHF PIN
I012
180°

IHF SPEAKER
I026 #

B-COVER
I015

VIBRA MOTOR
I023 #

POWER
ACTUATOR
I028

Bluetooth
Antenna
I031 #

MICROPHONE
I024 #

ONLY LEVEL 2

ENGINE MODULE
I009

X2700

MICROPHONE

VIBRA

SIM

X2000

POWER SWITCH
S2419 #

How to measure 4-pole switch
(built-in)

Ω   open
≈ ∞ Ω
Ω   pressed
≈ 0 Ω

MEASURE OPEN AND PRESSED
STATE ON BOTH SIDES OF SWITCH

Bluetooth

IHF-SPEAKER

POWER ON

= Component
changeable

13. QUICK TROUBLE SHOOTER PART 3

LCD MODULE
I008 (#)

KEYMAT
I002 (#)

UI SHIELD
I004

EARPIECE
I005

A1 = UI SHIELD
(#) ASSY

A2 = LIGHT GUIDE
(#) ASSY

LIGHT GUIDE
I006

DOME SHEET
I007 (#)

ENGINE MODULE
I009

X2400

KEYMAT

EARPIECE

DISPLAY

(#) = Component
changeable

14. BLUETOOTH & INFRARED TEST

Bluetooth test
You need another Bluetooth device (e.g. 6230) 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.
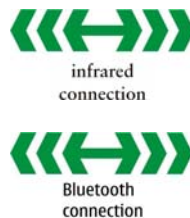
Infrared test
You need another infrared device (e.g. 6230) to do a GoNoGo test. The infrared windows of the devices must be directed to each other and should have a distance of approximate 15 cm. Make sure that infrared is activated in receiver device.

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.

Test unit   Reference unit, Bluetooth /infrared activated

Settings on the test unit:

- Press the red **End** key to reach the Home Menu
- Select **Names** and select **Search** for an entry

  If phone and SIM memory is empty, create one new entry.
- **Select** an entry and select **Details**
- Select **Options**
- Select **Send business card**

  A) - for infrared test: Select **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 this message on receiver device.

    You will <u>not</u> get a confirmation on sender device.

  B) - for Bluetooth test: Select **Via Bluetooth**

    If needed (for e.g. after a sw-update), enter a name for this device
- select **Options**
- select **Accept**

  Search window appears, if all Bluetooth devices in range will be displayed, the test is successful!
- Press red **End** key to reach the Home Menu

  Note: If the Bluetooth is activated, switch it off!

15. 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 NOKIA Online. 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 Online.
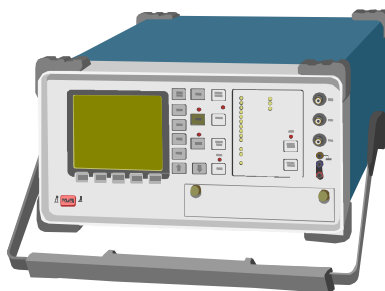
Mobile Phone Tester

16. BATTERY TEST

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

Please refer to the actual information on NOKIA Online.

http://www.astratec.co.uk/   http://www.cadex.com/

Approved 1.0
MGR

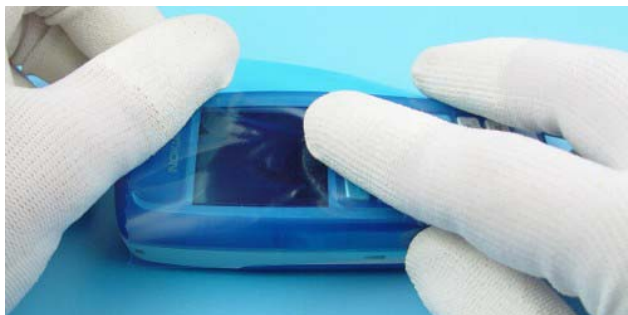CONFIDENTIAL   17.3.2005

17. 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.

![NOKIA CONNECTING PEOPLE]

PAGE 22 (22)   Approved 1.0
CMO Operations & Logistics   MGR
WW Service Solutions & Development
Bochum / Germany   CONFIDENTIAL   17.3.2005

18. ESD PROTECTION REQUIREMENTS

Please refer to the NOKIA Online document Service Supplier Requirements in folder General instructions.
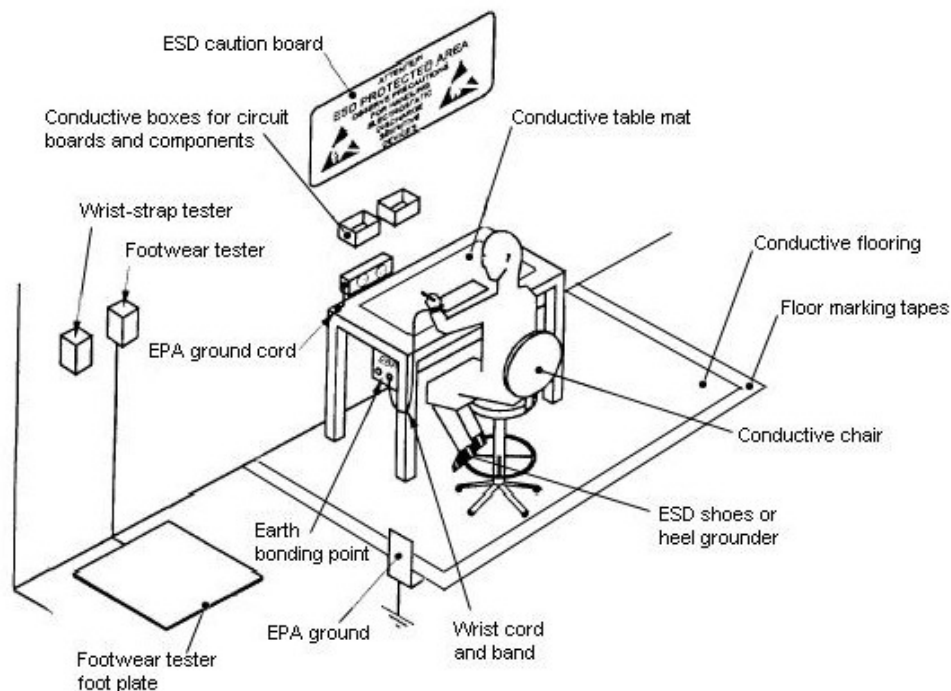
USE Conductive bags and boxes   NO Smoking
USE ESD compatible service tools   NO Drinking
USE Conductive wastebaskets   NO Eating
USE ESD gloves when handling PWBs/PCBs   NO Dust
USE Cleaning material without changing el. Characteristics   NO Useless Items
USE Grounded service equipment, i.e. soldering station   NO Normal pressured air for cleaning
USE ESD clothes such as coat or frock   modules/displays

The video covers general issues concerning Electro-Static Discharge (ESD)