

SERVICE MANUAL Level 1&2



RA-6

Transceiver characteristics:

Band:

EGSM: Quad-band 850/900/1800/1900MHz

WCDMA: 2100MHz

Display:

Inner - LCD: Active matrix color display (800x352 pixels); 16M colors **Outer - LCD:** Active matrix color display (240x320 pixels); 16M colors

Camera:

Main Camera: 3.2 Megapixel with flash and autofocus

<u>Sub_Camera:</u> QCIF camera for video calling

Operating System:

Series 60

Connections:

Wireless: WLAN, Bluetooth, IRDA, GPS
Connector: Mini USB Connector; AV Connector

Memory:

MicroSD™ (max 2GB)



Transceiver with BP-4L Li-Ion battery pack

Talk time	Standby	Note
up to 5h	up to 14days	Depends on network parameters





TABLE OF CONTENTS

IAD	LE OF CONTENTS	Page
1.	CHANGE HISTORY	3
2.	COPYRIGHT	3
3.	WARNINGS AND CAUTIONS	4
4.	ESD PROTECTION	4
5 .	CARE AND MAINTENANCE	5
6.	BATTERY INFORMATION	5
7.	EXPLODED VIEW	6
8.	SPARE PARTS OVERVIEW	7
9.	GENERAL RECYCLING RECOMMENDATION	8
10 .	LEVEL 2 SOLDER COMPONENTS	9
11.	SERVICE TOOLS	10
12 .	SW-UPDATE	11
13 .	UPPER BLOCK DISASSEMBLY	12
14.	UPPER BLOCK ASSEMBLY	16
15 .	LOWER BLOCK DISASSEMBLY	20
16 .	LOWER BLOCK ASSEMBLY	26
17 .	LEGEND FOR QUICK TROUBLE SHOOTER	33
18 .	QUICK TROUBLE SHOOTER - POWER ON	34
19 .	QUICK TROUBLE SHOOTER - CHARGING	35
20.	QUICK TROUBLE SHOOTER - NO SERVICE	36
21.	QUICK TROUBLE SHOOTER - WLAN/BLUETOOTH	37
22.	QUICK TROUBLE SHOOTER - GPS	38
23.	QUICK TROUBLE SHOOTER - EARPIECE	39
24.	QUICK TROUBLE SHOOTER - IHF SPEAKER	40
25 .	QUICK TROUBLE SHOOTER - DISPLAY	41
26.	QUICK TROUBLE SHOOTER - SUB DISPLAY	42
27.	QUICK TROUBLE SHOOTER - MICROPHONE	43
28.	QUICK TROUBLE SHOOTER - CMT KEYMAT	44
29.	QUICK TROUBLE SHOOTER - QWERTY KEYMAT	45
30.	QUICK TROUBLE SHOOTER - SEND/END/SOFT KEYS	46
31.	QUICK TROUBLE SHOOTER - PUSH TO TALK KEY	47
32.	QUICK TROUBLE SHOOTER - CAMERA KEY	48
33.	QUICK TROUBLE SHOOTER - FLASH LIGHT	49
34.	QUICK TROUBLE SHOOTER - SUB CAMERA	50
35	OUTCK TROURLE SHOOTER - CAMERA	51



1. CHANGE HISTORY

Status	Version No.	Date	Comments
Draft	0.1	05.Apr.2007	Initial draft
Approved	1.0	07.May.2007	Approval
Approved	2.0	21.Nov.2007	Exploded view & Spare Parts overview updated

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:

CMO Operation & Logistics
Training and Vendor Development
Multimedia Creation & Support
mailto:Service.Manual@nokia.com

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

2. COPYRIGHT

Copyright © 2007 Nokia. All rights reserved.

Reproduction, transfer, distribution or storage of part or all of the contents in this document in any form without the prior written permission of Nokia is prohibited.

Nokia, Nokia Connecting People, and Nokia X and Y are trademarks or registered trademarks of Nokia Corporation. Other product and company names mentioned herein may be trademarks or tradenames of their respective owners.

Nokia operates a policy of continuous development. Nokia reserves the right to make changes and improvements to any of the products described in this document without prior notice.

Under no circumstances shall Nokia be responsible for any loss of data or income or any special, incidental, consequential or indirect damages howsoever caused.

The contents of this document are provided "as is". Except as required by applicable law, no warranties of any kind, either express or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose, are made in relation to the accuracy, reliability or contents of this document. Nokia reserves the right to revise this document or withdraw it at any time without prior notice. The availability of particular products may vary by region.

IMPORTANT

This document is intended for use by qualified service personnel only.



3. WARNINGS AND CAUTIONS

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.

4. ESD PROTECTION

Nokia requires that service points have sufficient ESD protection (against static electricity) when servicing the phone.

Any product of which the covers are removed must be handled with ESD protection. The SIM card can be replaced without ESD protection if the product is otherwise ready for use.





All electronic parts of the product are susceptible to ESD. Resistors, too, can be damaged by static electricity discharge.

All ESD sensitive parts must be packed in metallized protective bags during shipping and handling outside any ESD Protected Area (EPA).

Every repair action involving opening the product or handling the product components must be done under ESD protection.

ESD protected spare part packages MUST NOT be opened/closed out of an ESD Protected Area. For more information and local requirements about ESD protection and ESD Protected Area, contact your local Nokia After Market Services representative.



5. CARE AND MAINTENANCE

This product is of superior design and craftsmanship and should be treated with care. The suggestions below will help you to fulfil any warranty obligations and to enjoy this product for many years.

- Keep the phone and all its parts and accessories out of the reach of small children.
- Keep the phone dry. Precipitation, humidity and all types of liquids or moisture can contain minerals that will corrode electronic circuits.
- Do not use or store the phone in dusty, dirty areas. Its moving parts can be damaged.
- Do not store the phone in hot areas. High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics.
- Do not store the phone in cold areas. When it warms up (to its normal temperature), moisture can form inside, which may damage electronic circuit boards.
- Do not drop, knock or shake the phone. Rough handling can break internal circuit boards.
- Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the phone.
- Do not paint the phone. Paint can clog the moving parts and prevent proper operation.
- Use only the supplied or an approved replacement antenna. Unauthorised antennas, modifications or attachments could damage the phone and may violate regulations governing radio devices. All of the above suggestions apply equally to the product, battery, charger or any accessory.

6. BATTERY INFORMATION

Note: A new battery's full performance is achieved only after two or three complete charge and discharge cycles! The battery can be charged and discharged hundreds of times but it will eventually wear out. When the operating time (talk-time and standby time) is noticeably shorter than normal, it is time to buy a new battery. Use only batteries approved by the phone manufacturer and recharge the battery only with the chargers approved by the manufacturer.

Unplug the charger when not in use. Do not leave the battery connected to a charger for longer than a week, since overcharging may shorten its lifetime.

If left unused a fully charged battery will discharge itself over time Temperature extremes can affect the ability of your battery to charge.

For good operation times with Ni-Cd/NiMh batteries, discharge the battery from time to time by leaving the product switched on until it turns itself off (or by using the battery discharge facility of any approved accessory available for the product).

Do not attempt to discharge the battery by any other means Use the battery only for its intended purpose. Never use any charger or battery which is damaged.

Do not short-circuit the battery. Accidental short-circuiting can occur when a metallic object (coin, clip or pen) causes direct connection of the + and - terminals of the battery (metal strips on the battery) for example when you carry a spare battery in your pocket or purse. Short-circuiting the terminals may damage the battery or the connecting object.

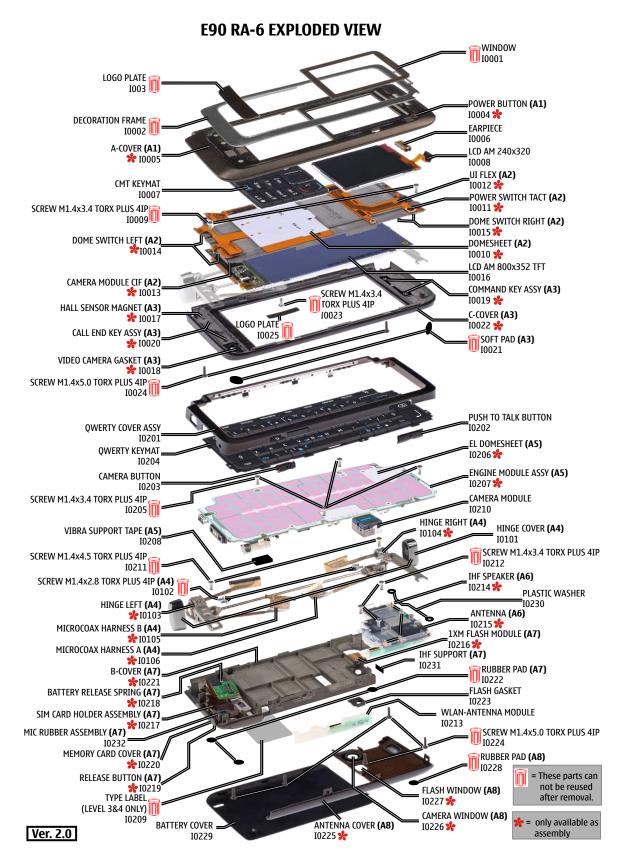
Leaving the battery in hot or cold places, such as in a closed car in summer or winter conditions, will reduce the capacity and lifetime of the battery. Always try to keep the battery between 15°C and 25°C (59°F and 77°F). A phone with a hot or cold battery may temporarily not work, even when the battery is fully charged. Batteries' performance is particularly limited in temperatures well below freezing.

Do not dispose batteries in a fire! Dispose of batteries according to local regulations (e.g. recycling). Do not dispose as household waste.



7. EXPLODED VIEW

See corresponding ITEM/CIRCUIT REF in the Spare Parts Service Bulletins on NOL.

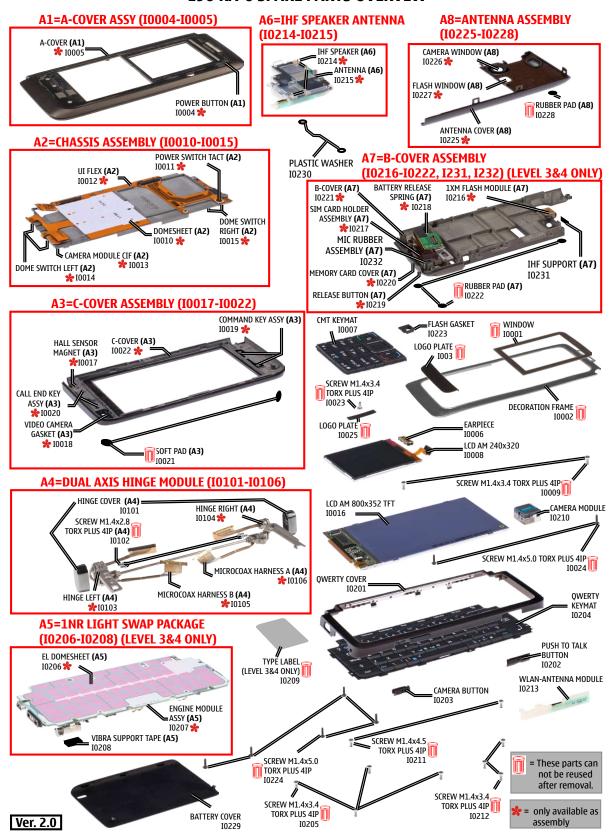


Page 6 (51) CONFIDENTIAL ISSUE 2
Copyright © 2007 NOKIA. All rights reserved.



8. SPARE PARTS OVERVIEW

E90 RA-6 SPARE PARTS OVERVEW





9. GENERAL RECYCLING RECOMMENDATION

NOKIA

Confidential

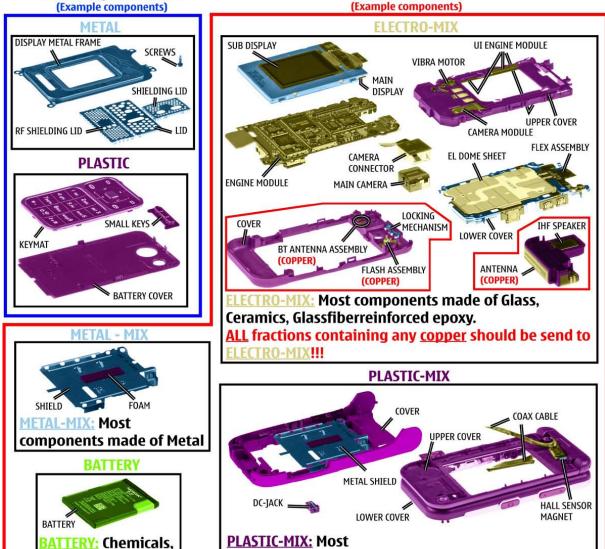
13.11.2006 MGR

CMO Operations & Logistics Training and Vendor Development **Multimedia Creation & Support**

General Recycling recommendation







Some of these options can be utilized directly and some need pretreatment as for instance dismantling, grinding, milling, etc.

For sorting the waste into fractions for recycling, your recycler will offer you more specific information, but a **GENERAL RULE** is:

components made of Plastic

pment: There are recyclers that can process this "multimaterial" for high recycling yields. Metals: Fractions containing metals must always be collected and sent for (metal) material recycling. Plastics: Pure plastics fractions (i.e. covers) can be sent for (plastics) materials recycling. Mixed Plastic/Metals: A metal fraction contaminated with plastics does not represent a problem for metal

recycling/recovery whereas recycling/recovery of plastics is generally sensitive for contamination by other materials.

🤍 ELECTRO 🔵 METAL 🛑 PLASTIC 🛑 BATTERY

Ver. 3.0

Plastic and Ceramics

Copyright © 2006 NOKIA Corporation. All rights reserved



10.LEVEL 2 SOLDER COMPONENTS

No solder able components for Level 2



11.SERVICE TOOLS



FLS-5 incl. ACF-8, Driver and User Guide

Dongle and flash device incorporated into one package, developed specifically for POS use.



ACF-8 power FLS-5.



Travel Charger AC-4 Universal Power Supply is used to Small and lightweight charger for fast charging of your phone battery.



DKE-2 Service Cable to connect the PC with the mini USB connector.



SS-81 Camera removal tool. One side is for disassembly, the other side for assembly.



RJ-150 Soldering Jig



Internal Battery BP-4L Inserted under the back cover, this Li-Ion battery provides power in a lightweight package.



Lead-free Solder Wire Mandatory for lead-free products (Level 2 only).



0772040 NMP Standard Toolkit (V2)

For more informations refer to the Service Bulletin (SB-011) on NOKIA Online.

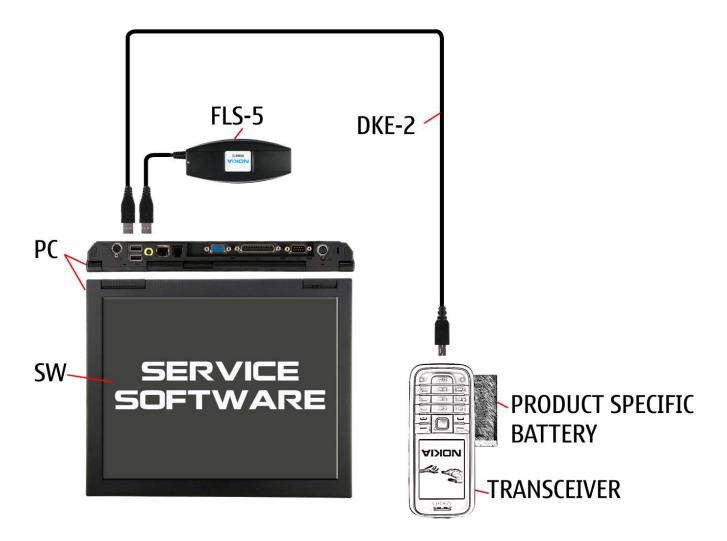
Supplier or manufacturer contacts for tool re-order can be found in "Recommended service equipment" document on NOKIA Online.



12.SW-UPDATE

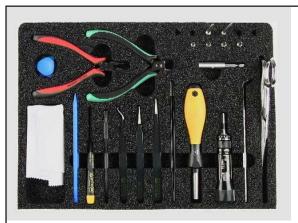
Flash Concept – (Point of Sales)

To use FLS-5 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**.

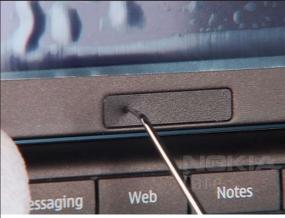




13.UPPER BLOCK DISASSEMBLY



1. You will need the Nokia Standard Toolkit version 2. Also refer the General Mechanical Guideline video for additional hints about the tools and component handling.



2. Open the assembly. Peel up the LOGO PLATE with the dental pick.



3. Discard the LOGO PLATE. Do not use it again when reassembling.



4. Unscrew the 3 Torx Plus size 4 screws in the order shown.



5. Discard these screws. Do not use them again when reassemble.



6. Close the assembly again. Lift up the A-COVER at the hinge side. Move it away from the hinge side. Now it can be removed easily.





7. Remove the CMT KEYMAT.



8. Lift up the LCD AM.



9. Carefully open the flex connector of the display with the SS-93.



10. Ease out the glued in EARPIECE with the SS-93.

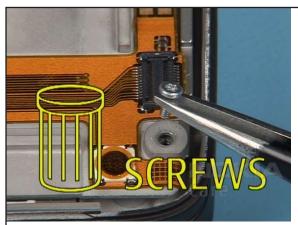


11. Discard it, do not use this part again when reassemble.



12. Unscrew these 2 Torx Plus size 4 screws.





13. Discard them. Do not use them again.



14. Gently lever up the flex connector of the LCD AM 800x352.



15. Open the assembly. Lift up the C-COVER, beginning at the OWERTY KEYMAT side.



16. It is important to protect the surface with a piece of cloth before continuing. Flip over both parts of the hinge.

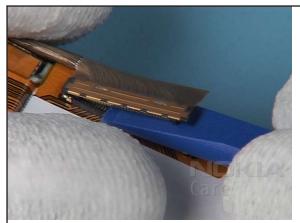


17. Now turn the CHASSIS ASSEMBLY.



18. Be double carefully while opening these 2 MICROCOAX HARNESS connectors.



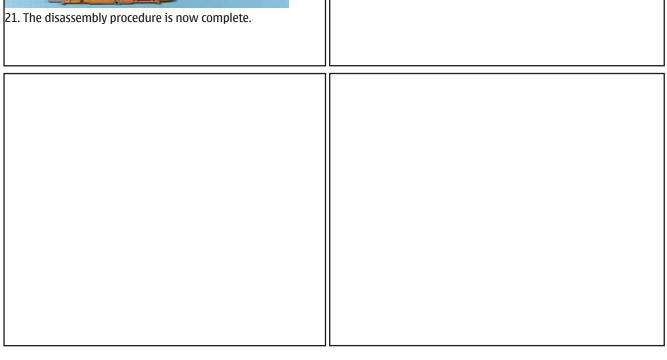


19. It is very important not to bend these connectors while opening. Otherwise the connectors become unusable.



20. Now the CHASSIS ASSEMBLY can be removed.







14.UPPER BLOCK ASSEMBLY



1. Assembly.



2. Bring the hinge parts in the position shown.



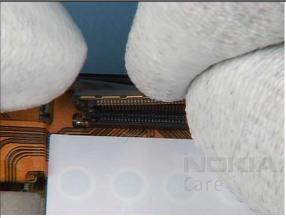
parts of the hinge.



3. Fit the C-COVER. Note the correct alignment to the mounting 4. Flip over the C-COVER ASSEMBLY together with the mounting parts of the hinge.



5. Now place the CHASSIS ASSEMBLY.



6. Close both MICROCOAX HARNESS connector. Check for correct fitting of the connectors before going on.





7. Close the LCD connector.



8. Use the short ones of the screws.



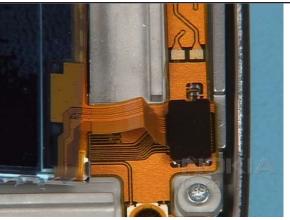
9. Insert the two screws.



10. Set the correct torque.

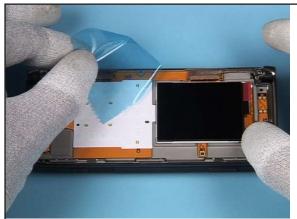


11. Apply the torque to the screws in the shown order.



12. Place the LCD AM 240x320. Close the flex foil connector.





13. Touch the LCD at the shown edge only. Otherwise the delicate driver of the display will be damaged and becomes unusable.



14. Place the CMT KEYMAT.



15. Place the new EARPIECE into the A-COVER ASSEMBLY.



16. Carefully push it down at the plastic frame with the SS-93 as shown. Never push at the metal capsule, otherwise it will be impressed and the IHF SPEAKER becomes unusable.



17. Place the A-COVER ASSEMBLY, beginning at the opposite side of the hinge.



18. Do not mismatch these screws. Place this short screw...





19. ...in the middle...



20. ...and these longer ones...



21. ...at both edges of the A-COVER ASSEMBLY.



22. Set the correct torque.



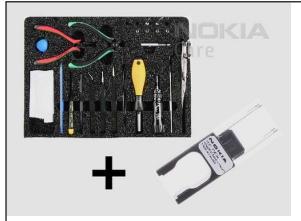
23. Apply the correct torque in the order shown.



24. Align the new LOGO PLATE first. Then smooth it down evenly.



15.LOWER BLOCK DISASSEMBLY



1. You will need the Nokia Standard Toolkit version 2 and the SS-81 camera removal tool. Also refer to the General Mechanical Guideline video for additional hints about the tools and component handling.



2. Remove the BATTERY COVER.



3. Release this clip of the ANTENNA COVER with the SRT-6 first.



4. Now release the two clips on the side of the assembly.



5. Release the clip located on the edge.



6. Now the ANTENNA COVER can be removed easily.





7. Pull up the FLASH GASKET.



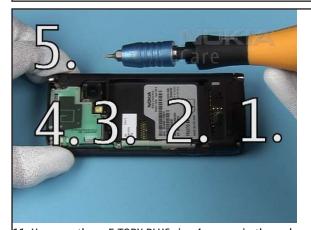
8. Insert the SS-81 into the housing of the CAMERA MODULE. Note the correct positioning of the tool.



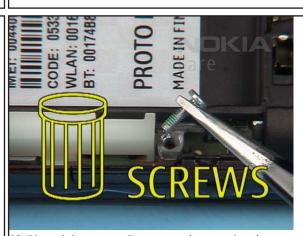
9. Gently push it down. The clips of the housing are released now.



10. Lift out the CAMERA MODULE now.

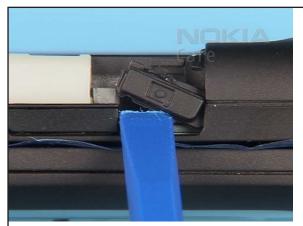


11. Unscrew these 5 TORX PLUS size 4 screws in the order shown.



12. Discard the screws. Do not use them again when reassembling.





13. Lever out the CAMERA BUTTON...



14. ...and the PUSH TO TALK BUTTON.



15. Open the assembly and lift the QWERTY COVER.



16. It is possible to remove the QWERTY KEYMAT without unlocking the QWERTY COVER.



17. Carefully release the hidden clips of the QWERTY COVER, located on the right side...



18. ...on the middle near the LOGO PLATE...





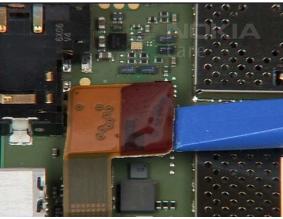
19. ...and on the left side near the hinge. After that, the QWERTY COVER can be removed easily.



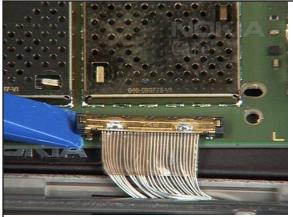
20. Unscrew these 4 Torx Plus size 4 screws in the order shown.



21. Also discard these screws. Do not use them again.



22. Mind the hidden components underneath when opening the flex foil connector.

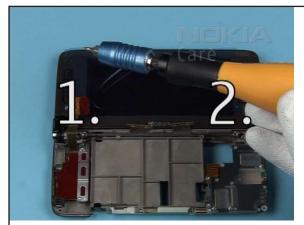


23. The MICROCOAX HARNESS connectors are very delicate. Be double careful when releasing these 2 connectors.



24. The ENGINE MODULE can be removed now.





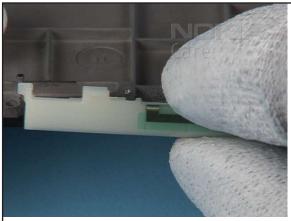
25. Unscrew this 2 Torx Plus size 4 hinge screws.



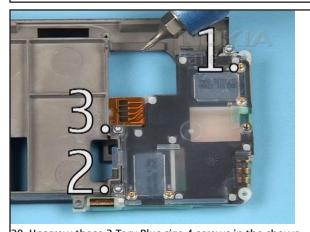
26. Discard them. Do not use them again when reassemble.



27. The upper assembly can be removed now.



28. The WLAN ANTENNA MODULE can be removed.



29. Unscrew these 3 Torx Plus size 4 screws in the shown order.



30. Discard them, do not use them again.





31. Remove the ANTENNA/IHF MODULE.



32. The disassembly of the lower block is now complete.



16.LOWER BLOCK ASSEMBLY



1. Assembly.



2. Note that the FLASH MODULE is very delicate and becomes useless in consequence of mechanical stress.



3. Replace the ANTENNA/IHF MODULE.



4. First take the 3 new screws 1.4M x 3.4 ...

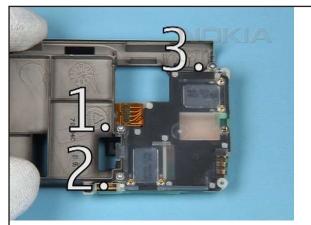


5. ...and place them.

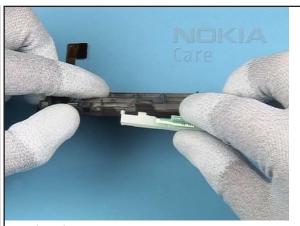


6. Set the correct torque.





7. Apply the correct torque to the screws in the order shown.



8. Replace the WLAN-ANTENNA MODULE.



the cables.



9. Replace the upper assembly. Mind the correct positioning of 10. Note: False placement will destroy the delicate MICROCOAX cables.



11. Insert the 2 hinge screws. Note! Use the correct length M1.4 x 4.5



12. Set the correct torque.

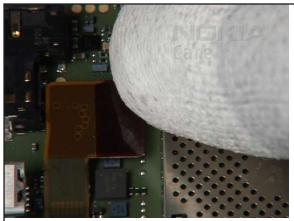




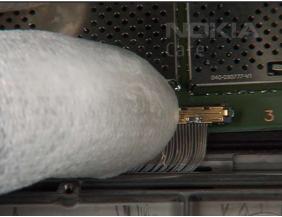
13. Apply the torque to both screws.



14. Place the ENGINE MODULE over the protected display of the upper part.



15. Close the flex foil connector.



16. Be double accurate while closing this 2 MICROCOAX HARNESS connectors.



17. Flip over the ENGINE MODULE.



18. Check the correct placement of the cables before going on.





19. Take these 4 screws...



20. ...and place them into their recesses.



21. Set the correct torque.



22. Apply the torque to these screws in the order shown.



23. Replace the QWERTY COVER, beginning on the left side, where the connectors are located.



24. Close the clips, check that no cables will be squeezed, otherwise the DUAL AXIS HINGE MODULE becomes unusable.





19. Insert the QWERTY KEYMAT.



20. Mind the correct positioning of the key mat before going on.



21. Click the snaps into their places.



22. Replace the CAMERA BUTTON...



23. ...and the PUSH TO TALK BUTTON.



24. Take these 5 new screws.





25. Place them into their threads.



26. Set the correct torque.



27. Apply the torque to the screws in the shown order.



28. Replace the FLASH GASKET.



29. Mind the alignment tab while replacing the CAMERA MODULE.



30. Push it into its housing evenly.





31. Mind the cleanness of the camera and window when replacing the ANTENNA COVER, beginning at the hinge side.



32. Close this clip first...



33. ...then the clip on the edge...



34. ...followed by the 2 snaps at this side.

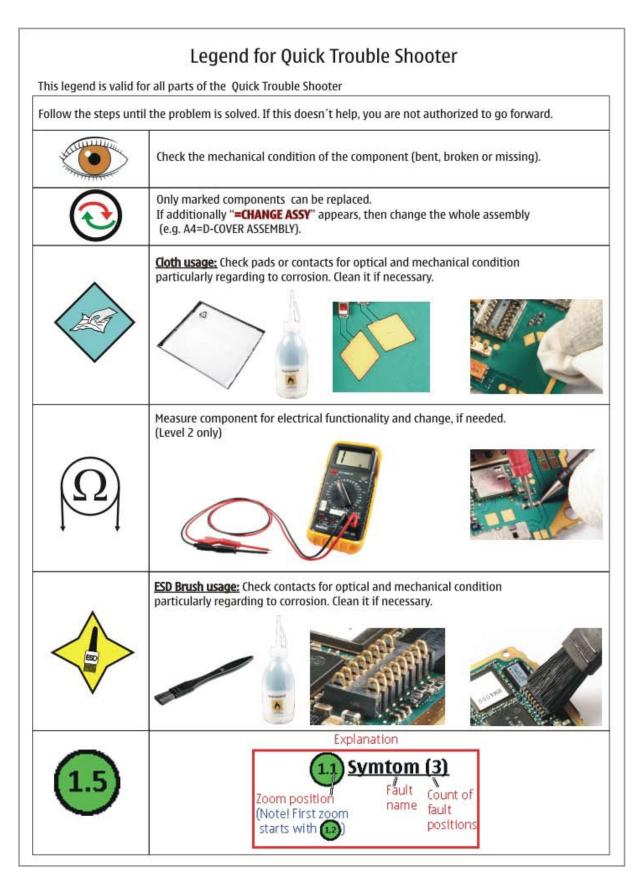


35. The last clip is located close to the CAMERA BUTTON. Click it 36. Replace the BATTERY COVER. into its place slightly.





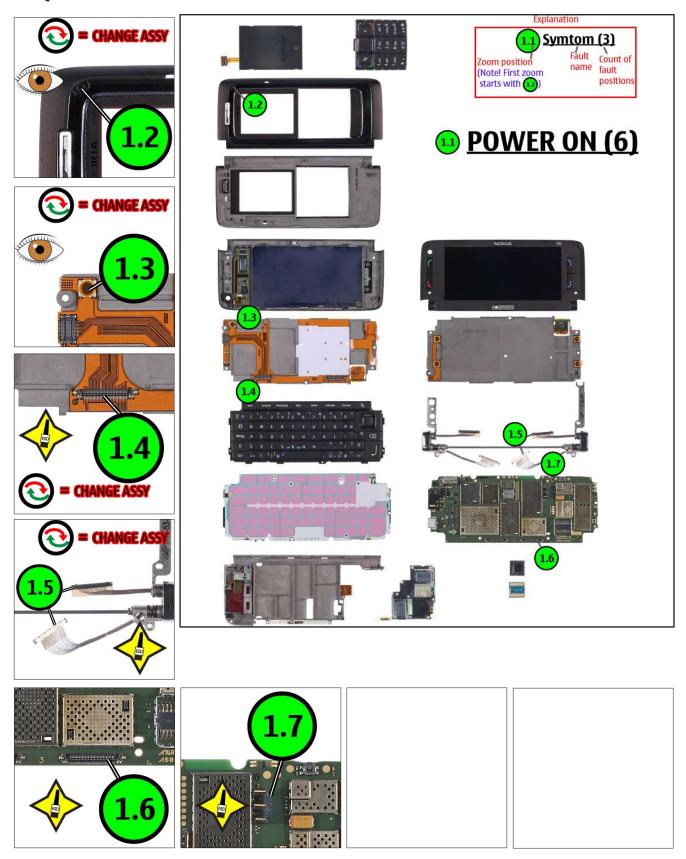
17.LEGEND FOR QUICK TROUBLE SHOOTER



ISSUE 2



18.QUICK TROUBLE SHOOTER - POWER ON





19.QUICK TROUBLE SHOOTER - CHARGING





20.QUICK TROUBLE SHOOTER - NO SERVICE





21.QUICK TROUBLE SHOOTER - WLAN/BLUETOOTH



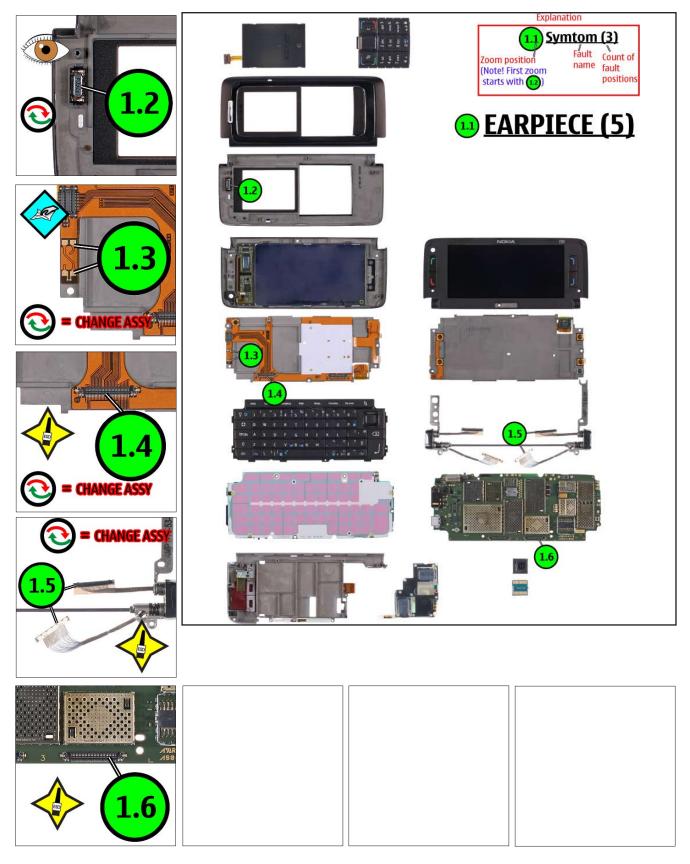


22.QUICK TROUBLE SHOOTER - GPS





23.QUICK TROUBLE SHOOTER - EARPIECE



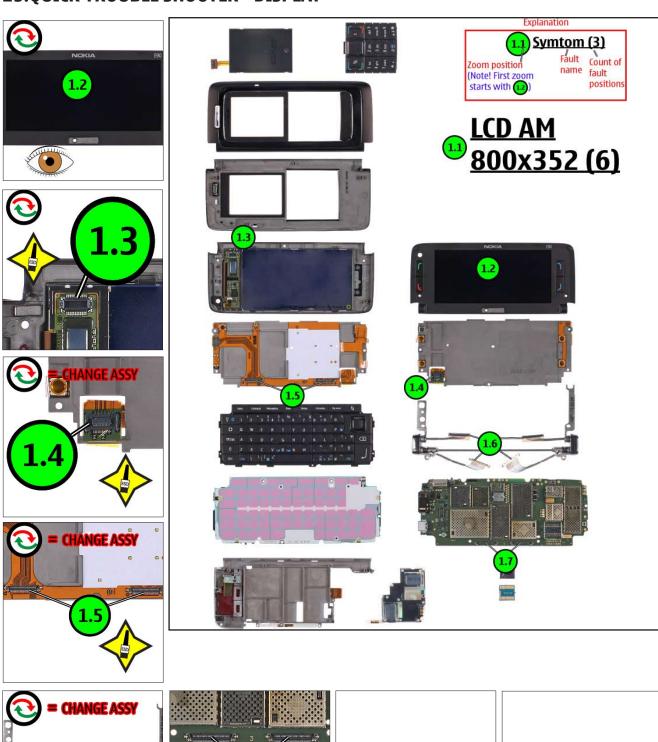


24.QUICK TROUBLE SHOOTER - IHF SPEAKER





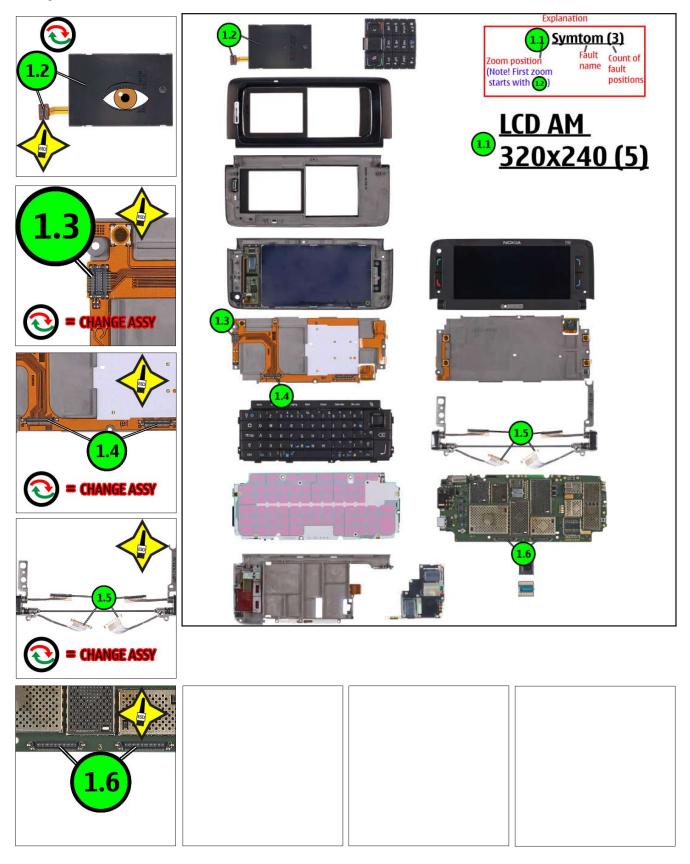
25.QUICK TROUBLE SHOOTER - DISPLAY



ISSUE 2



26.QUICK TROUBLE SHOOTER - SUB DISPLAY



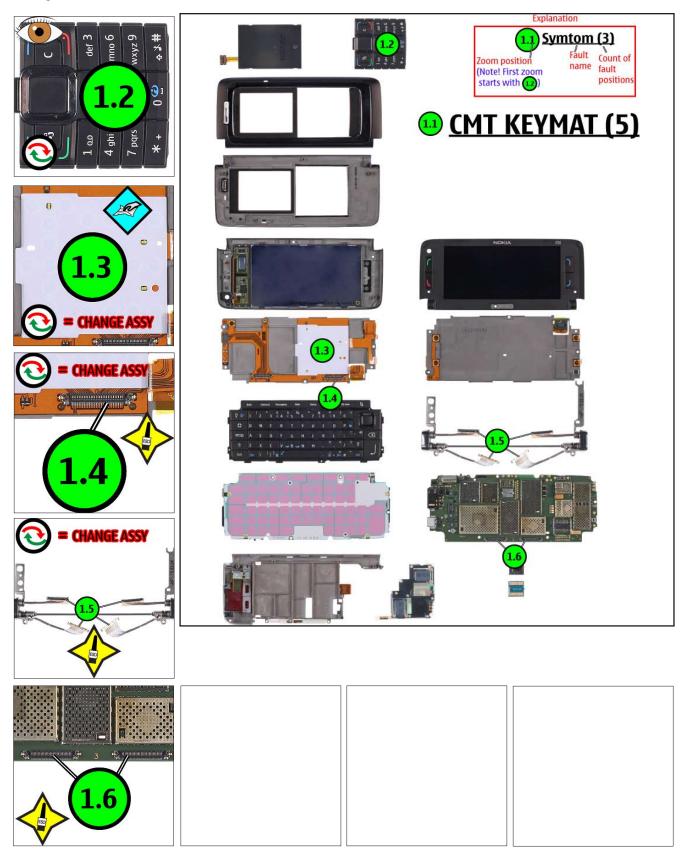


27.QUICK TROUBLE SHOOTER - MICROPHONE



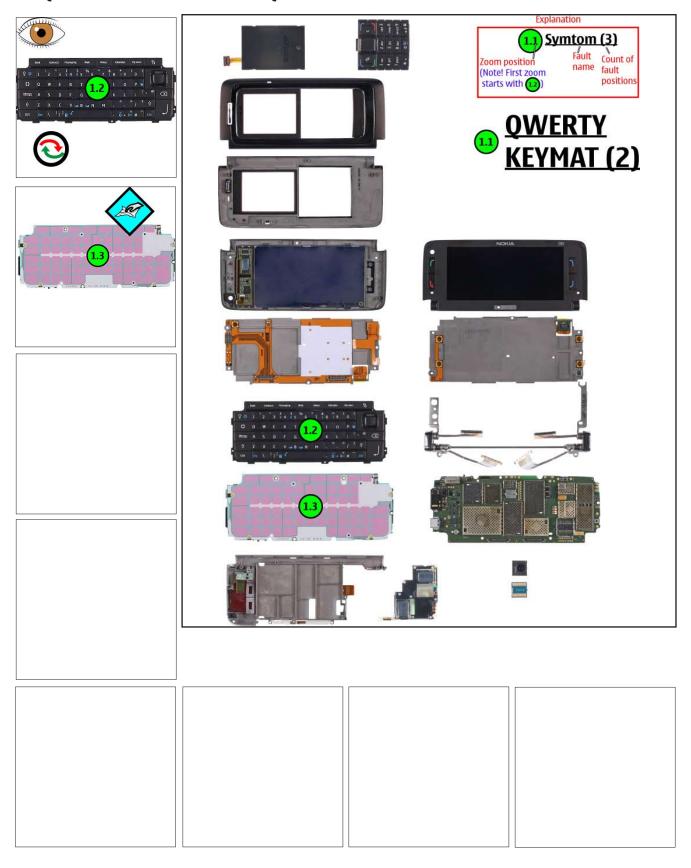


28.QUICK TROUBLE SHOOTER - CMT KEYMAT





29.QUICK TROUBLE SHOOTER - QWERTY KEYMAT





30.QUICK TROUBLE SHOOTER - SEND/END/SOFT KEYS





31.QUICK TROUBLE SHOOTER - PUSH TO TALK KEY





32.QUICK TROUBLE SHOOTER - CAMERA KEY





33.QUICK TROUBLE SHOOTER - FLASH LIGHT





34.QUICK TROUBLE SHOOTER - SUB CAMERA





35.QUICK TROUBLE SHOOTER - CAMERA

